

**Investigating Psychosocial Factors:
Supporting Clinical Decisions for Outpatient Diabetes Care**

by

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To Mother and Dad

*Happy are those who dream dreams, and are willing to pay the price to make them come true.
In pursuit of our higher ground, indeed, we find our path by walking it.*

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This dissertation has achieved one measure of success by answering my research questions, which were refined and honed through the tireless support of the dissertation committee, several other researchers, colleagues, and other health care practitioners. It is also successful in that it helps fulfill a personal goal, conceived over a decade ago. At that time, I began to understand the chasm that existed between practitioners and certain at-risk patients. Over the course of hundreds of home visits and clinical consultations, I witnessed at-risk patients lament that the health care “system” failed to understand their plight; I also had the opportunity to work with highly skilled practitioners who expressed frustration with not knowing enough about—or learning too late of—the persistent structural and individual circumstances that afflicted certain patients who simply could not overcome various barriers to care. At that time, I committed to a journey to do what I could to help close that chasm, to participate meaningfully in extending the capabilities of “personalized” medicine, and to better incorporate the patient’s social and environmental experience into the chronic care clinical consultation to facilitate better outcomes. This dissertation is an important step in that journey; it represents the last, major academic milestone in my time as a doctoral student at the University of Michigan School of Information, time that has included earning a Master’s degree from the School of Social Work. I am extremely fortunate to have had the support of many individuals that made this step possible.

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ABSTRACT

Practitioners often make decisions to diverge from clinical targets specified in diabetes clinical practice guidelines (CPGs) based on each patient's unique situation, although reasons for this are poorly understood. Additionally, while practitioners understand that psychosocial factors may influence self-care behavior and subsequently health outcomes, little is known as to how psychosocial factors influence clinical decisions, including those that deviate from guidelines. Therefore, through a sequential exploratory mixed methods study involving physician interviews (n=17) and a survey of physicians, nurses and diabetes educators (n=229) I investigated practitioners' access to, and use of, psychosocial information as a basis for clinical decisions in outpatient diabetes care. This study revealed four major findings. First, that psychosocial information is not considered when patients have good glycemic control, but they do consider it when a patient: 1) has persistent, poor glycemic control, 2) is a new patient or has a new diabetes diagnosis, and 3) worsening of glycemic control. Second, access to psychosocial information is granted through dialogue in an ongoing, trusting relationship. Physicians use specific techniques to build trusting relationships, which include demonstrating caring and creating a safe environment characterized by patient autonomy and privacy. Third, awareness of psychosocial information may trigger decisions to personalize HbA1c targets, pursue less aggressive treatment plans or augment guideline-concordant treatment with actions to address barriers to care, such as referrals to

prescription assistance. Fourth, EHR designs are not optimized for capturing and retrieving qualitative and situationally-dependent psychosocial information, which tends to come in a narrative form. Specifically, study findings offer new insight into circumstances in which practitioners' decisions may deviate from CPGs, and their rationales for doing so. Practitioners connecting patients to supplemental resources represent efforts to reduce negative impacts of psychosocial factors on diabetes-related self-care. If successful, these actions could ultimately improve diabetes outcomes. Findings regarding the importance of a trusting clinician-patient relationship also suggest the importance of care continuity to psychosocial information use. Moreover, results indicate that effective use of psychosocial information requires unique socio-technical supports that include clinician-patient relationship-building efforts and digital tools that are optimized for the capture and retrieval of information in narrative form.

CHAPTER 1

INTRODUCTION

The dominant model of disease today is biomedical, and it leaves no room within its framework for the social, psychological, and behavioral dimensions of illness.

— George L. Engel, 1977

Psychosocial factors influence outcomes for adult, type 2 diabetes mellitus (T2DM or “diabetes”) patients; such factors affect patient self-care practices which are a vital component of the diabetes treatment regimen. “Psychosocial factors” is a general term used in various areas of healthcare research. In this study, I define psychosocial factors as the psychological factors—how an individual thinks and feels—and social factors—an individual’s social milieu—that affect self-care behavior. They are the individual (e.g., financial circumstance, perceptions) and structural (e.g., social support, community resources, and cultural traditions) factors that influence self-care behavior (see Appendix B: *Psychosocial Factors*) (Brotman, Golden, & Wittstein, 2007; Bruner et al., 2004; Institute of Medicine, 2008a; Kemp & Brandwein, 2010; Macleod & Davey Smith, 2003; Martikainen, Bartley, & Lahelma, 2002; McEwen, 1998; Singh-Manoux, 2003). Psychosocial information differs from clinical information which is currently regularly collected and used (i.e., information contained in lab reports) in two ways: 1) it tends to be *qualitative* in nature, and 2) it is *situational*, defined by the patient’s circumstances. Although psychosocial factors are widely recognized to affect patient adherence to recommended diabetes self-care behaviors, little is known about how health

care practitioners, such as physicians and nurses, consider such factors as they make, or provide input into, various diabetes clinical decisions (see Appendix C :*Type 2 Diabetes Clinical Decisions*). Further, information use models do not explain how psychosocial factors may influence decisions to deviate from practice guidelines, which are important considerations when evaluating practice performance against clinical goals.

1.1. Overview

This study investigates how health care practitioners access and use psychosocial information to provide diabetes care. Specifically, I examine the relevance of psychosocial factors, the sources of psychosocial information, and the particular clinical decisions that are influenced by taking these factors into consideration. Further, I describe elements that impede and facilitate the use of psychosocial information, including the role that current electronic health record (EHR) tools play in the documentation and retrieval of psychosocial information.

1.2. Research Questions

This study has been organized to answer the following research questions:

1. Which psychosocial factors do practitioners perceive as important in making, or providing input into, care decisions for adult, type 2 diabetes patients? What is their relative priority?
2. How do practitioners access psychosocial information?
3. How do practitioners use psychosocial information? How does this information influence their care decisions?
4. In which situations are psychosocial factors considered?
5. What practitioner characteristics (i.e. role, age) are associated with their use of psychosocial information?

6. What are the barriers and facilitators to acquiring and using psychosocial information? How effectively do current tools (templates, data fields, free text) support the storage and retrieval of psychosocial information?

1.3. Study Design

I used a mixed methods design in order to leverage the strengths of both qualitative and quantitative approaches. Initially, I conducted seventeen in-depth, semi-structured interviews with physicians with experience providing diabetes care in the outpatient setting, primarily at sites where the physicians practiced. I then developed an online survey instrument, informed by my analysis of the interview data. To determine generalizability and explore relationships between variables, I then administered the online survey to primary care physicians, nurse practitioners, and diabetes educators. Survey participants are individuals who, depending on their specific clinical role, have experience making, or providing input into, diabetes care clinical decisions in the outpatient setting.

I used a grounded theory approach to analyze the interview data. This analysis included developing categories and constructing visuals of findings that served as the foundation of a cognitive map, which depicts the physicians' thinking as they use psychosocial information in the course of providing diabetes care. I used descriptive statistics to describe the size and distributions of the various elements of the survey sample and inferential statistics to measure associations between variables, specifically independent t tests of differences in means, and a logistic regression.

1.4. Results and Contribution

There are four major findings resulting from this investigation, gleaned from both the interview and survey data analysis.

First, analysis of the interview and survey data revealed that practitioners do not consider psychosocial information when patients are stable and well controlled, but it is considered under three specific circumstances: 1) under *chronic* circumstances such as when treating at-risk patients or when a patient experiences persistent, poor glycemic control; 2) under *new* circumstances, such as when seeing a new patient or a patient who has been newly diagnosed with diabetes; and 3) when there is a *change* in circumstances, such as when a patient experiences worsening of glycemic control and/or when there is a sudden increase in unhealthy self-care behavior.

Second, analysis of the interview data revealed that physician's access to psychosocial information is granted through dialogue in the context of an ongoing trusting relationship. Patients are the most frequent source of psychosocial information, and study participants indicate that patients grant access to this information *only if* the relationship has been established and is maintained. They establish trust by involving the patient in clinical care decisions and respecting the patient's privacy. They also avoid pejorative language and tone.

Third, analysis of the interview data revealed that awareness of psychosocial information may trigger decisions to personalize HbA1c targets, pursue less aggressive treatment plans or augment guideline-concordant treatment with actions to address barriers to care. For example, these actions include referrals to: prescription assistance, food support, counseling, and transportation aid. Such actions can be triggered by awareness of a patient experiencing: financial strain, mental health issues, low social support, or other issues.

Fourth, analysis of the interview and survey data revealed that current electronic health record (EHR) designs are not optimized for capturing and retrieving qualitative and situationally dependent psychosocial information which tends to come in narrative form. In addition, survey participants indicated that, among the sources I investigated, the EHR is the *least frequently* used and viewed to be the least reliable as illustrated by the participants' *low confidence* in its accuracy. Notably, survey findings also indicate that clinical decisions are occasionally made without the necessary psychosocial information.

The results of the study include a description of how psychosocial information is considered in the process of making, or providing input into, diabetes care clinical decisions. As part of this analysis, I created the conceptual model of psychosocial information access (Figure 6.4) to describe how psychosocial information is *accessed*. The model is based on both survey and interview data, and it includes the psychosocial factors that practitioners perceive to be the most relevant, practitioners' sources for this information, the perceived accuracy and availability of psychosocial information, and the associated clinical decisions that this information influences. The most relevant of the twenty-three psychosocial factors examined are: financial strain, mental health status, life stressors, food security, social support, and health literacy. This psychosocial information is obtained primarily from the patient, the family and caregivers, other practitioners. The EHR is also a source for this information, albeit a less important one.

I created the aforementioned cognitive map of psychosocial information use (Figure 5.2) to describe how psychosocial information is *used* to make diabetes care clinical decisions. The map represents how physicians from my interview sample use psychosocial information to inform clinical decisions. It contains the following five

components: 1) Consider Clinical Practice Guidelines (CPGs) in Context of Patient Situation, 2) Build and Maintain Rapport with Patient, 3) Making the Clinical Decision, 4) Assessing the Patient, and 5) Triggers to Gathering and Using Psychosocial Information. The map depicts how psychosocial information informs clinical decisions; this information helps physicians determine the care regimen appropriate for the patient which is dependent partly upon relevant psychosocial factors.

Study results can be used to help guide future work concerning the use of psychosocial information in three key research areas that investigate approaches to improve chronic care outcomes: 1) influence of psychosocial factors on chronic disease self-care behavior, 2) clinical decision making, and 3) use of clinical practice guidelines (CPGs). I introduce a conceptual framework in chapter two (Figure 2.2) to situate the focus of the investigation in the current literature, showing associations to these three areas of research. I revisit and finalize the conceptual framework in chapter seven (Figure 7.2), where I discuss my major findings within the context of gaps in the literature. My findings help advance the understanding of *when* and *how* psychosocial information is used for diabetes care in the outpatient setting. They offer key insights regarding the rationale physicians use to intentionally diverge from targets established in the CPGs. Psychosocial information helps them understand that following the guidelines may not be appropriate, and in some cases, may put the patient at risk. Findings also offer insights as to how practitioners make clinical decisions to mediate the influence of psychosocial factors when particular factors may present barriers to following recommended self-care practices. Last, study findings offer key insights as to the practitioner understanding of the influence of psychosocial factors on diabetes self-care. They include perspectives

based on three practitioner roles: physician, nurse practitioner, and diabetes educator. All are responsible for making, or providing input into, diabetes care decisions.

In summary, study findings can be used by practitioners and developers of health informatics capabilities (i.e. clinical decision support systems, electronic health records) focused on improving diabetes outcomes. They can help support important recommendations to build upon current capabilities to more effectively capture and enable use of psychosocial information, which is often in narrative form. The recommendations are focused on improving diabetes outcomes, recommendations for which there is considerable, building momentum signified by the development of the patient-centered medical home model (PCMH) and the Institute of Medicine detailing the need to enhance the collection and use of psychosocial information, which I detail in the next chapter.

CHAPTER 2

LITERATURE REVIEW

Millions of our citizens do not now have a full measure of opportunity to achieve and to enjoy good health. Millions do not now have protection or security against the economic effects of sickness. And the time has now arrived for action to help them attain that opportunity and to help them get that protection.

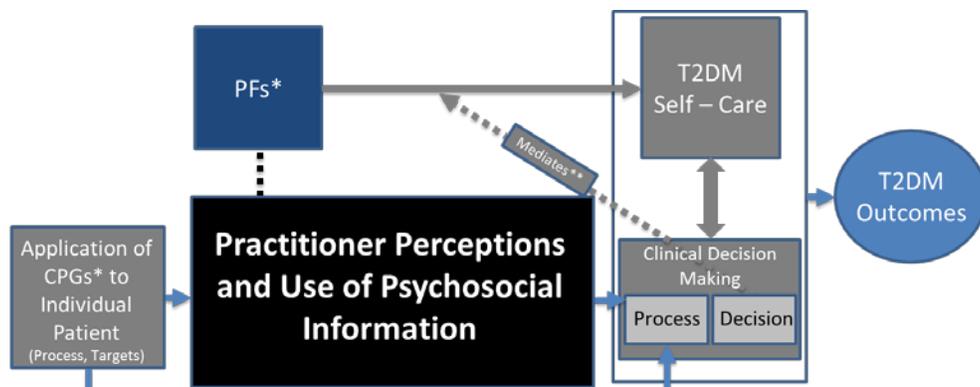
— Harry S. Truman, September 19, 1945

2.1. Diabetes Context

Type 2 diabetes mellitus (T2DM or “diabetes”) is a metabolic disorder of elevated glucose concentration in blood. This chronic condition is caused by the gradual, deleterious decline in the efficacy of the insulin hormone. As of the end of 2011—the most current year the Centers for Disease Control and Prevention (CDC) has reported statistics—there were nearly 21 million people with diabetes in the United States, approximately 7.8 percent of the population. Since 1980, the number of Americans diagnosed with T2DM has more than tripled (Center for Disease Control, 2011). Every year, 1.3 million individuals are diagnosed. Escalating incidence and prevalence are associated with self-care behavior. The number of new cases is associated with increased prevalence of obesity; 80 percent of individuals with diabetes are either overweight or obese (U.S. Department of Health and Human Services, 2013). The growing prevalence of obesity is related to unhealthy dietary practices and sedentary lifestyle (Rodbard et al., 2009).

2.2. Literature Review Overview – Conceptual Framework

This literature review is organized to reflect the published literature in three areas: psychosocial factors and diabetes self-care, clinical decision making (CDM), and clinical practice guidelines (CPGs). I constructed a conceptual framework to situate the focus of my research—practitioner perceptions and use of psychosocial information for diabetes care—in the literature to illuminate the gaps that this research fills (see Figure 2.2) (Ravitch & Riggan, 2011). The black box on the Initial Conceptual Framework of Psychosocial Factors in Outpatient Diabetes Care is the central focus of this work, showing relationships to the extant literature. In the first part of the literature review (section 2.3), I describe the literature on the influence of psychosocial factors on self-care which impacts diabetes outcomes. Second, I outline the literature on clinical practice guidelines (CPGs) in support of clinical decisions (section 2.4). Third, I describe the literature on clinical decision making, focusing on patient-centered care as this is the area most aligned with use of psychosocial information specific to the patient situation (section 2.5). As is evident from this Figure, there are currently gaps in understanding practitioner perceptions and use of psychosocial information in providing diabetes care in the outpatient setting. It is these gaps that the present research aims to fill.



* - PFs – Psychosocial Factors; * - CPGs – Clinical Practice Guidelines

Figure 2.2: Initial Conceptual Framework of Psychosocial Factors in Outpatient Diabetes Care

Psychosocial Factors

Psychosocial factors are important because they influence diabetes outcomes, primarily through their effect upon recommended self-care behavior. The diabetes care regimen requires substantial responsibility from the patient for regular self-care practices; adhering to them results in positive health outcomes. Psychosocial factors can both facilitate, and present barriers to, diabetes self-care behavior.

For example, high levels of social support are consistent *with specific healthy self-care practices*—dietary behavior, foot care, fasting blood sugar (FBS) testing and daily physical activity (Tang, Brown, Funnell, & Anderson, 2008; Watkins, Quinn, Ruggiero, Quinn, & Choi, 2013)—and ultimately, positive outcomes such as glycemic control (Iida, Parris Stephens, Rook, Franks, & Salem, 2010; Mayberry & Osborn, 2012; Rintala, Jaatinen, Paavilainen, & Åstedt-Kurki, 2013; Sharfi, Azad, Avat, & Siamak, 2013; Shier, Ginsburg, Howell, Volland, & Golden, 2013). Also, spirituality has been shown to positively influence social support (Polzer & Miles-Shandor, 2005, 2007; Quinn, Cook, Nash, & Chin, 2001), and subsequently glycemic control (Newlin, Melkus, Tappen, Chyun, & Koenig, 2008).

Conversely, financial strain has been shown to present *barriers to medication adherence*, which lead to poor glycemic control (Dubois, Chawla, Neslusan, Smith, & Wade, 2000; Piette & Kerr, 2006). In addition, health literacy, as measured by the short-form Test of Functional Health Literacy in Adults (s-TOFHLA), influences medication self-care behavior and is inversely associated with HbA1c control (Schillinger, Grumbach, Piette, Wang, Osmond, Daher, Palacios, et al., 2002). Neighborhood factors such as unsafe housing have been shown to present barriers to the following recommended diabetes self-care practices known to influence outcomes: healthy dietary

practices, achieving recommended levels of physical activity (Dahmann, Wolch, Joassart-Marcelli, Reynolds, & Jerrett, 2010), and smoking cessation (Cerdá, Diez-Roux, Tchetgen, Gordon-Larsen, & Kiefe, 2010; Halonen et al., 2012).

Primary care practitioners recognize the general influence of psychosocial factors on diabetes self-care behavior, as evidenced by their acknowledgement of the need for better collection and use of psychosocial information (Robert Wood Johnson Foundation, 2011). The Institute of Medicine (IOM), national physician surveys, and statements from associations representing primary care physicians, have all recommended that psychosocial information should be included in the electronic health record. In 2014, the

IOM released a comprehensive report in two phases detailing the need to identify and capture social determinants of health in the electronic health record (Institute of Medicine,

Individual Factors		
Sociodemographic <ul style="list-style-type: none"> Sexual orientation Race/ethnicity Country of origin/U.S. born or non-U.S. born Education Employment Financial resource strain: Food and housing insecurity 	Psychological <ul style="list-style-type: none"> Health literacy Stress Negative mood and affect: Depression and anxiety Psychological assets: Conscientiousness, patient engagement/activation, optimism, and self efficacy 	Behavioral <ul style="list-style-type: none"> Dietary patterns Physical activity Nicotine use and exposure Alcohol use
Individual-Level Social Relationships and Living Conditions <ul style="list-style-type: none"> Social connections and social isolation Exposure to violence 		Neighborhoods/Communities <ul style="list-style-type: none"> Geocodable domains: Socioeconomic and race/ethnic characteristics

Figure 2.2.1: IOM Table of Psychosocial Factors

2014a, 2014b). Included in this recommendation are both individual and structural psychosocial factors (see Figure 2.2.1).

However, in addition to recommendations to improve the documentation of psychosocial information, practitioners cite the need for better understanding of *how* psychosocial factors may impede diabetes self-care behavior (Bruce et al., 2009; Delamater, 2006; Estabrooks et al., 2012; Funnell, 2006; Ganz, 2008; Institute of Medicine, 2008a; Krist et al., 2014b). Moreover, barriers to understanding stem from the lack of clarity in *defining* the factors that may be an issue for diabetes self-care, and the

lack of *tools* to measure their influence (Fisher et al., 2010; Funnell, 2006). Although tools have been created to assess psychosocial factors that influence outcomes for conditions such as physical rehabilitation, childhood obesity, and cancer (Holland & Bultz, 2007; Holm-Denoma, Smith, Lewinsohn, & Pettit, 2014; Wideman & Sullivan, 2012), standardized tools are not widely used for the majority of chronic conditions encountered in outpatient care—including diabetes.

Given this lack of clarity regarding the definition and measurement of psychosocial factors, it is important to understand how practitioners currently prioritize, access, and use this information to support patient-centered clinical decisions, potentially in efforts to lessen the influence of psychosocial barriers (Karazsia, Berlin, Armstrong, Janicke, & Darling, 2014). However, little is known about what factors practitioners consider to be relevant to their diabetes-related clinical decisions. Additionally, little is known about how psychosocial information may influence *specific* diabetes care clinical decisions, in particular, attempts to help patients address psychosocial barriers to care. As depicted in the black box in Figure 2.2, these questions are addressed in the context of the present research.

Clinical Practice Guidelines (CPGs)

Clinical practice guidelines (CPGs) are designed to support the complex process of clinical decision making. They represent the synthesis of best practice evidence through, “systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances” (Grossman, Field, & Lohr, 1990; Medlock et al., 2011; Nigam, 2013; Nilasena & Lincoln, 1995; Sacks et al., 2011; Todd, 1998). CPGs attempt to standardize clinical decisions by reducing variations

in these decisions. Nevertheless, CPGs are designed to only provide a framework for decision making for practitioners; it is recognized that they do not replace clinical judgment, practitioner-patient interaction, or the decision making process (Higgs, 2008). As is outlined in the literature review, it is known that there are often situations in which the diabetes care offered by clinicians deviates from clinical guidelines. While the literature suggests that psychosocial factors may contribute to this reality, the specific role of psychosocial information in decisions to deviate from clinical guidelines has not yet been directly investigated. Specifically, the psychosocially-relevant situations that prompt deviation from guidelines are not well understood. For instance, low levels of social support are known to present barriers to following recommended medication practices, and restrict access to healthy foods and exercise; however, the specific situations that practitioners may consider psychosocial factors remain unclear. As shown in the black box in Figure 2.2, this research addresses these questions.

Clinical Decision Making

The literature reviewed below shows that clinical decision making is a multifaceted process which can involve evaluating CPGs against *patient-specific information* in order to individualize care—which recognizes the unique characteristics of the patient and the patient’s situation; patient-specific information can include psychosocial factors such as patient preferences and level of health literacy (Ceriello et al., 2012; Hirsch et al., 2012; Radwin & Alster, 2002; Riddle & Karl, 2012). I describe theoretical perspectives on clinical decision making, and focus my review on information access for clinical decisions, as this area is closely associated with how psychosocial information may be accessed, and subsequently used. Despite this prior research,

however, the role of psychosocial information in clinical decision making is not well understood; this is important because psychosocial information differs from other types of clinical information because it is typically qualitative and in narrative form. Therefore, there is a need to understand how practitioners access and use psychosocial information in their clinical decision making; this research addresses this question as shown in Figure 2.2. Finally, an issue related to access and use of information investigated here is the question of barriers and facilitators to information access. This question is important to interrogate at this time given the recent widespread adoption of digital tools such as EHRs in outpatient care.

2.3. Psychosocial Factors - Overview and Influence on T2DM Self-Care

There is no universal definition for the concept of “psychosocial factors”. Rather, it is a general term used in various health research areas (R. J. Anderson, Freedland, Clouse, & Lustman, 2001; Martikainen et al., 2002). For this study, I define psychosocial factors as the psychological and social influencers of self-care behavior which impact diabetes outcomes. These include the psychological factors—how an individual feels—and the social factors—an individual’s social milieu—that affect the self-care behavior known to influence health outcomes (Brotman et al., 2007; Chida & Hamer, 2008; Institute of Medicine, 2008b; Macleod & Davey Smith, 2003; Martikainen et al., 2002; McEwen, 1998; Plomin & Asbury, 2005; Powledge, 2011; Singh-Manoux, 2003).

Psychosocial information differs from clinical information, such as clinical information from laboratory reports, in two ways. First, psychosocial information tends to be *qualitative* in nature, and is often conveyed through *stories*. This information reflects how the patient thinks about himself/herself, or their environment (Carey, 2003). As a

result, practitioners are inclined to interpret this information in *narrative form*, rather than as specific data elements (Walsh, 2004). Subsequently, clinical decisions are based upon how the practitioner interprets the narrative (Kay & Purves, 1996). Second, psychosocial information tends to be *situational*, defined and bound by the particular patient’s circumstances. As a result, *considerable judgment is required* to determine relevance and level of influence for a particular clinical situation (MacMullin & Taylor, 1984; Taylor, 1982, 1991).

I group psychosocial factors into two categories: individual and structural. *Individual* factors include health literacy and psychological issues such as an individual’s thoughts, perceptions, attitudes and emotions. *Structural* factors are related to the circumstances of an individual’s lived experience, which include their social (i.e., level of social support) and community environment (i.e., neighborhood setting). The neighborhood setting includes community characteristics such as housing sufficiency and stability, level of neighborhood safety, and access to health care and healthy foods. Culture and spirituality refer to cultural norms, faiths, beliefs and practices (Singh-Manoux, 2003; Soto et al., 2015). Table 2.3 shows a summary of these individual and structural psychosocial factors.

Table 2.3: Psychosocial Factors that Affect T2DM Outcomes

Individual Factors	Structural Factors
SES - Social position, income, education	Social support - family support, supportive relationships, involvement in spiritual communities, and neighborhood cohesion
Activities of daily living / Responsibilities – self-care activities, family and/or work responsibilities	Culture and spirituality - cultural norms and traditions, dietary practices, faith beliefs and practices

Thoughts, perceptions, attitudes and emotions - Perception of discrimination, risk perception, lived experience, effort/reward balance, perception of control/autonomy	Neighborhood setting - community violence/safety, neighborhood cohesion, housing sufficiency and stability, access to healthy foods, transportation, access to health care, access to physical activity
Health Literacy – Ability to access and understand health information that can support informing care decisions, commonly supported upon diagnosis with Diabetes Self-Management Education (DSME)	
Mental Health - mood and affect, thought processes, orientation, manner and approach, alertness, appearance	

2.3.1. Psychosocial Factors and Health Outcomes

Psychosocial factors can exert considerable influence upon general health outcomes. Research indicates that an individual’s living environment can have a *larger* effect on their health outcomes than the specific health care services they access. For example, neighborhood cohesion is positively associated with physical and mental health outcomes; community violence is associated with negative physical and mental health outcomes. Supportive social networks, which include family support and involvement in spiritual communities, are positively associated with physical and mental health outcomes (Robert Wood Johnson Foundation, 2011). Perceptions of discrimination, lack of supportive relationships, and stressors are associated with negative physical and mental health outcomes (R. J. Anderson et al., 2001; C. R. Clark et al., 2013; Delamater et al., 2001; Egan, Tannahill, Petticrew, & Thomas, 2008; Institute of Medicine, 2008b; Martikainen et al., 2002; Robert Wood Johnson Foundation, 2011).

Psychosocial factors can influence health outcomes in two ways, through: 1) psychobiological processes, and 2) self-care behavior (Martikainen et al., 2002). With

regard to psychobiological processes, social support is associated with general cardiovascular, endocrine, and immune system health (Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Similarly, decreasing socioeconomic status (SES) is associated with a general increase in psychosocial stressors, which result in a range of physiological effects associated with poor health outcomes, such as: unhealthy cholesterol profiles, behavioral depression, and obesity (Hertzman & Siddiqi, 2009). Individuals who experience difficult life stressors—or experience them with less capability to manage them effectively—experience higher levels of stress, anxiety, anger, and frustration; all are associated with poor mental and physical health (P. A. Hall & Taylor, 2009). As for diabetes in particular, there is an extensive body of research describing the effect of psychosocial factors like social support, SES, and stressors on physiological outcomes associated with diabetes, such as: anxiety which is associated with poor glycemic control, and depression, which is associated with hyperglycemia and acceleration of coronary heart disease (Bartley, 2006; Berkman, 1995; Berkman & Kawachi, 2000; Krishnan, Cozier, Rosenberg, & Palmer, 2010; Mirowsky & Ross, 1998).

Recommended diabetes self-care behavior can be influenced considerably by psychosocial factors. The effect of psychosocial barriers on recommended self-care behavior can be lessened by clinical decisions which may influence T2DM outcomes. Therefore, for this study, my focus is on the *psychosocial factors that affect self-care behavior required* for the T2DM treatment regimen, which influence health outcomes, as depicted in Figure 2.2. This is especially important since diabetes treatment guidelines require considerable lifestyle changes for many patients. There are seven self-care practices vital to achieving and maintaining good T2DM health outcomes: 1) healthy

eating, 2) regular physical activity, 3) consistent blood glucose monitoring, 4) medication adherence, 5) attending regular appointments, 6) healthy coping skills, and 7) risk-reduction behaviors; all are associated with glycemic control, reduced complications, and improved quality of life (Shrivastava, Shrivastava, & Ramasamy, 2013).

I now summarize the extensive literature describing the influence that psychosocial factors have on diabetes self-care behavior (Cosansu & Erdogan, 2014; Delamater et al., 2001; Duke, Colagiuri, & Colagiuri, 2009; Funnell et al., 2009; Levinson & Roter, 1995; Siminerio, Funnell, Peyrot, & Rubin, 2007; Skovlund & Peyrot, 2005; Tapp et al., 2012; Willens, Cripps, Wilson, Wolff, & Rothman, 2011; W. Wilson et al., 1986). In addition, I describe the influence of psychosocial factors on diabetes outcomes, segmented by the individual and structural factors shown in Table 2.3.

Individual Psychosocial Factors

Individual psychosocial factors include: SES, daily activities, thoughts perceptions, attitudes, emotions, health literacy, and mental health. As will be shown, these individual factors influence diabetes outcomes through their influence on self-care behavior.

SES

In a health context, socioeconomic status (SES) is defined by education, income and health insurance payor status (Kangovi et al., 2013). Belonging to low SES groups is associated with poor diabetes outcomes, when compared to individuals in high SES groups. This difference is primarily due to lower adherence to one's treatment regimen (Jotkowitz et al., 2006). Patients from low SES groups who indicate cost as a barrier to medication adherence experience poorer glycemic control, primarily due to financial barriers to medication access (Piette & Kerr, 2006). Such problems may be common

given that diabetic patients incur higher treatment costs when compared to those with other common chronic conditions (Dubois et al., 2000; Rogowski, Lillard, & Kington, 1997).

Activities of Daily Living / Responsibilities

Following recommended self-care practices requires that the patient make a substantial time investment, which may interfere with activities of daily living (i.e., basic and instrumental), and family and/or work responsibilities. Diabetes self-care can restrict the time and attention patients can devote to instrumental activities of daily living (IADL), such as childcare and employment responsibilities, since the self-care regimen frequently includes time-consuming activities such as: regular blood glucose monitoring to measure fasting blood sugar (FBS) levels, medication management, physical activity, and meal preparation (Russell, Suh, & Safford, 2005; Safford, Russell, Suh, Roman, & Pogach, 2005). Notably, time demands tend to increase with number of health conditions, particularly in relation to medication management (Noël, Chris Frueh, Larme, & Pugh, 2005). These increased demands are likely to be experienced by many adult T2DM patients since a majority of them have at least one comorbid condition, while 40% have three or more (Piette & Kerr, 2006).

Thoughts, Perceptions, Attitudes and Emotions

Patient perceptions and attitudes are also associated with diabetes outcomes through the pathway of self-care behavior. T2DM patients who report high levels of trust in their physicians are more likely to engage in self-care known to reduce risk of disease progression, such as smoking cessation and increased physical activity (Selby, 2010). Also, a study showed that African American diabetes patients who perceived racial

discrimination in health care settings were less likely to adhere to their prescribed medications (J. Wagner & Abbott, 2007).

Health Literacy

Low health literacy is associated with poor glycemic control and high rates of the aforementioned microvascular complication of retinopathy (Schillinger, Grumbach, Piette, Wang, Osmond, Daher, Palacios, et al., 2002). Systematic reviews of diabetes self-management education (DSME) programs describe how they can result in improved outcomes, specifically for health literacy (Bielamowicz, Pope, & Rice, 2013; Duke et al., 2009; Ellis et al., 2004; Loveman et al., 2003; Norris, Lau, Smith, Schmid, & Engelgau, 2002; Rutten, 2005; Wild et al., 2007). However, standardized diabetes education is not uniformly accessed by patients. Low SES, low literacy, and low numeracy are access barriers to diabetes DSME programs (D. R. Anderson & Christison-Lagay, 2008; Bowen et al., 2013; Claydon-Platt, Manias, & Dunning, 2014; Funnell et al., 2009).

Mental Health

Diabetic patients are at increased risk for mental health issues; for example, depression is twice as common for individuals with diabetes, compared to non-diabetics (Findley, Shen, & Sambamoorthi, 2011; Fisher, Glasgow, & Strycker, 2010; Goldney, Phillips, Fisher, & Wilson, 2004; Heisler & Resnicow, 2008; Ward & Druss, 2015). Strained social relationships and the emotional burden of the chronic condition contribute to the incidence of depression, although direct causal pathways have not been identified (Arigo, Smyth, Haggerty, & Raggio, 2014; Moulton, Pickup, & Ismail, 2015). Having a mental health condition can present barriers to following the care regimen; diabetes patients with depression have poorer self-care behavior when compared to T2DM

patients without depression (D. R. Anderson & Christison-Lagay, 2008; Piette & Kerr, 2006).

Structural Psychosocial Factors

Structural psychosocial factors are related to the individual's lived experience. These factors include: social support, neighborhood setting, and culture and spirituality. I now summarize the literature on the influence that these three specific structural factors have on diabetes self-care.

Social Support

Level of social support is positively associated with HbA1c at target goal (Arigo et al., 2014; Kumari, Head, & Marmot, 2004), primarily through support with following dietary restrictions, medication self-care, smoking cessation, and better coordination and integration between primary care and specialty care providers (i.e., psychiatrists) (Chwastiak et al., 2015; Heisler & Resnicow, 2008). Consistent adherence to self-care recommendations involves not only the patient, but also their social support system (Funnell, 2010). Family members and caregivers can provide four types of social support that help facilitate healthy self-care practices: 1) tangible (e.g., help with activities of daily living, transportation to medical appointments, financial assistance), 2) emotional (e.g., encouragement, affirmation, comfort), 3) informational (e.g. reminders about appointments, medications, dietary choices), and 4) appraisal (e.g. recognition of healthy choices, noting clinical goals reached). High levels of social support, specifically from spouses and other family members, are associated with increased self-care adherence to the diabetes regimen (Iida et al., 2010; Mayberry & Osborn, 2012; Rintala et al., 2013; Sharfi et al., 2013; Shier et al., 2013). Positive social support is a predictor for healthy dietary behavior, foot care, blood glucose monitoring, and performing daily physical

activity (Tang et al., 2008; Watkins et al., 2013). Family members can also provide support through observable actions that make following recommended self-care behaviors easier (Mayberry & Osborn, 2012). For example, family members can participate in physical activity and make healthy eating choices. Conversely, unsupportive social behaviors are associated with lower adherence to the care regimen. Although relatively rare, T2DM patients who indicate that family members disregard the recommended diabetic diet by offering them unhealthy foods have low adherence to dietary guidelines (Henry, Rook, Stephens, & Franks, 2013; Mayberry & Osborn, 2012; Song et al., 2012).

Neighborhood Setting

Neighborhood characteristics can exert a negative effect on diabetes outcomes (Auchincloss et al., 2009). T2DM patients from high-poverty neighborhoods have higher rates of: poor dietary practices, physical inactivity, and smoking (Cerdá et al., 2010; Halonen et al., 2012). Neighborhood characteristics shown to contribute to poor diet and low physical activity for diabetes patients include: unsafe housing (Cadzow, Vest, Craig, Rowe, & Kahn, 2014; Jack, Jack, & Hayes, 2012; Shenassa, Stubbendick, & Brown, 2004), access barriers to healthy foods (Beaulac, Kristjansson, & Cummins, 2009) and limited access to recreation facilities (Dahmann et al., 2010). African American patients from low-resourced communities have expressed how neighborhood stressors present considerable challenges to diabetes self-care behavior (Jack, Liburd, Tucker, & Cockrell, 2014; Senteio & Veinot, 2014).

Culture and Spirituality

Ethnic groups share various culturally-based behaviors that influence health outcomes. Culture is defined as the knowledge, beliefs, customs, traditions, and habits

shared by a group of people (Kittler, 1995). These are learned behaviors which are passed down from generation to generation through shared norms and customs. African American group membership has a negative influence on diabetes recommended self-care practices, specifically dietary behavior (L. Clark, Vincent, Zimmer, & Sanchez, 2009; Cossrow & Falkner, 2004; Scheder, 1988). This is explained by aspects of the traditional African American diet which are inconsistent with diabetes dietary recommendations. Hence, decreasing the sodium, fat, and cholesterol contained in traditional foods is a substantial lifestyle adjustment for some African American T2DM patients, which presents barriers to recommended dietary practices (Kulkarni, 2004; Senteio & Veinot, 2014). Hispanic group membership also has a negative influence on recommended dietary behavior (Hunt, Valenzuela, & Pugh, 1998). Membership in this group is associated with a high-fat diet in general (Daniulaityte, 2004), and a high-calorie diet with specific dietary choices (i.e., tortillas, soda) (Barquera et al., 2008; de Alba Garcia et al., 2007).

Spirituality can exert a positive influence on diabetes self-care in general. There is positive association between spirituality and self-management of diabetes risk factors (Watkins et al., 2013). For example, African American patients indicate that spirituality is an important source of support in helping them manage the demanding diabetes self-care regimen; they cite prayer and church attendance as sources of support (Newlin et al., 2008; Polzer & Miles-Shandor, 2005, 2007; Quinn et al., 2001).

Gaps Addressed in This Study

Most of the published literature concerning barriers to diabetes self-care behavior is focused on the patient experience, rather than *practitioners'* perspectives (Nam,

Chesla, Stotts, Kroon, & Janson, 2011). For example, mental health status is a psychosocial factor known to influence diabetes self-care behavior (Beverly, Brooks, Ritholz, Abrahamson, & Weinger, 2012; Delamater et al., 2001); there is a fairly robust area of research examining how depression can influence diabetes self-care behavior (Beverly et al., 2012; Chida & Hamer, 2008; Daniulaityte, 2004; Funnell, 2006; Mayberry & Osborn, 2012). However, the literature is sparse concerning practitioners perspectives on barriers to following diabetes self-care recommendations (Ritholz, Beverly, Brooks, Abrahamson, & Weinger, 2014; van Dam, van der Horst, van den Borne, Ryckman, & Crebolder, 2003). Subsequently, we do not know how treatment decisions may be influenced by psychosocial factors. Potential differences between patients and practitioners concerning perceptions of barriers to recommended self-care is important as it may influence outcomes in two ways. First, this disconnect can result in practitioners not understanding specific barriers to self-care and subsequently not recommending available support services to address these barriers (Peyrot, Rubin, & Siminerio, 2006). Second, these differences may limit the quality of the practitioner-patient interaction (R. M. Anderson, Fitzgerald, Gorenflo, & Oh, 1993; R. M. Anderson & Funnell, 2005). The quality of practitioner-patient communication is positively associated with the following *specific* self-care behavior known to influence diabetes outcomes: daily glucose monitoring (Ciechanowski, Katon, Russo, & Walker, 2001), medication behavior, daily foot check, healthy diet, and daily exercise (Piette, Schillinger, Potter, & Heisler, 2003).

Despite this considerable research describing the mechanisms linking specific psychosocial factors *and* the quality of the practitioner-patient relationship to diabetes

self-care behavior known to influence diabetes outcomes, little is known of *practitioners'* *understanding* of the relationships between psychosocial factors and diabetes self-care behavior. Further, little is understood concerning how practitioners perceive the comparative relevance of individual psychosocial factors and their potential impact on self-care behavior. This research purports to fill these gaps by addressing the following research question:

RQ1: Which psychosocial factors do practitioners perceive to be important in making, or providing input into, care decisions for adult, type 2 diabetes patients? What is their relative priority?

2.4. Clinical Practice Guidelines (CPGs) in Support of Clinical Decisions

The American Diabetes Association (ADA) annually publishes standards of care for practitioners, patients, and researchers which contain current recommendations for diabetes care. The ADA standards represent the principal recommendations for diabetes care in the United States (Eldor & Raz, 2009); however, several organizations develop and distribute clinical practice guidelines (CPGs). All of these guidelines attempt to translate current clinical insight into specific care recommendations. The ADA standards cover type 1 and type 2, as well as gestational diabetes, in the in- and out-patient setting. They address classification and diagnosis, testing for asymptomatic patients based on membership in at-risk patient populations, recommendations specific for glycemic control, setting treatment goals and thresholds, prevention and management of complications, assessment and management of comorbidity, and objectives for improving care. Please see Appendix D: *Outline of ADA Standards of Care* for an outline of the ADA Standards of Care.

ADA standards carry considerable influence. They are the source of standards of care used in many organizations and programs, including the Health Plan Employer Data and Information Set (HEDIS) (Fonseca & Clark, 2006). The HEDIS, a program under the NCQA, is used by more than 90 percent of health plans in the United States to measure outcomes and performance (National Committee for Quality Assurance, 2013).

ADA Clinical Practice Guidelines

The ADA maintains both process and target clinical practice guidelines (CPGs) (American Diabetes Association, 2015). Process guidelines include frequency of performing the HbA1c test, checking blood pressure at each clinical visit, nephropathy screening at minimum annually, retinopathy screening upon diagnosis and annually thereafter (less frequently following one or more normal eye exams), comprehensive foot exam at diagnosis and at least annually thereafter, providing smoking cessation treatment as applicable, providing access to diabetes self-management education (DMSE) and diabetes self-management support (DSMS) upon diagnosis and as needed thereafter. HbA1c should be tested at least twice per calendar year for patients who meet clinical goals, and four times per year for patients whose therapy has changed or are not meeting clinical goals.

CPGs include recommended targets for glycemic control (HbA1c < 7%), cholesterol (LDL < 100 mg/dl), and blood pressure (<130/80 mmHG). These targets are based on substantial empirical evidence—communicated extensively throughout the practitioner and T2DM patient population—that shows that patients who achieve and maintain these thresholds are at substantially decreased risk for disease-related complications and progression. The measure of HbA1c or “A1C” is of particular note.

This is a laboratory blood test that measures the average level of glucose (blood sugar) over a three month period. In general, the goal is below 7%. Younger patients who maintain target levels recommended in the guidelines experience improved health outcomes, improved patient satisfaction, and lower cost of care—largely achieved through a reduction in unnecessary procedures and health crises requiring hospitalization (D. J. Cook, Greengold, Ellrodt, & Weingarten, 1997; Gross et al., 2003; Lohr, 1994; Schmittiel et al., 2008).

ADA standards prioritize the treatment of hyperglycemia because the empirically-based consensus supports that reaching and maintaining specific glycemic thresholds reduces morbidity and complications like: retinopathy, nephropathy and neuropathy (Nathan et al., 2009). Additional important factors include management of dyslipidemia, hypertension, obesity and insulin resistance.

Annual updates to the ADA standards are based on new interventions—most commonly for new medications—that result in improved outcomes. New findings from empirical research can increase the number of therapeutic choices available to clinicians, which also increases the uncertainty inherent in selecting the *most appropriate* treatment for a particular patient.

Following from this, the ADA states that these standards are not meant to substitute clinical judgment; “these standards are not intended to preclude clinical judgment or more extensive evaluation and management of the patient by other specialists as needed” (American Diabetes Association, 2015). The ADA acknowledges that numerous risk factors contribute to the inherent complexity of diabetes care and describe evidence supporting a range of interventions—based on specific patient

situation—which may improve patient outcomes. Thus, the goals and thresholds reflect what is recommended for *most* patients, acknowledging that patient and practitioner preferences, comorbidity, and patient specific factors may justify modifications to specified thresholds.

Variety in Clinical Practice Guidelines

Other than the aforementioned ADA guidelines, different organizations publish and keep current CPGs, including: the Veterans Health Administration/United States Department of Defense (VA/DOD) (Pogach et al., 2004; Walter, Davidowitz, Heineken, & Covinsky, 2004), the International Diabetes Federation, the American Association of Clinical Endocrinologists (AACE), the ADA/European Association for the Study of Diabetes (EASD), the Canadian Diabetes Association, and the American College of Endocrinology (ACE)/AACE Road Maps to Achieve Glycemic Control (Rodbard et al., 2009). These organizations use CPGs to varying degrees. The multiplicity of these guidelines introduces ambiguity into clinical decisions for diabetes care.

2.4.1. T2DM Outcomes Evaluated Against CPGs

Although effective therapies have long been available to control blood glucose, cholesterol, and pressure (Schmittziel et al., 2008), such treatment availability has not resulted in achievement of clinical goals for the majority of patients. A relatively low proportion of diabetic patients meet the clinical goals specified in the ADA CPGs. In fairly large study populations, between 21-64% of diabetic patients had HbA1c < 7%, 22-46% had LDL cholesterol at goal, and 29-33% had blood pressure at goal; only 2-10% of diabetic patients are at recommended levels for *all three* goals (Davidson, 2007, 2009; Esposito, Chiodini, Bellastella, Maiorino, & Giugliano, 2012; Giugliano et al., 2011).

Diabetes outcomes vary across patient populations. Disparities persist that are associated with a patient's race, age, and level of education. African American and Hispanics experience a 50% to 100% higher diabetes-related mortality rate as compared to White Americans (Soto et al., 2015; Spencer et al., 2011; Two Feathers et al., 2005). Conversely, cholesterol targets are achieved *more frequently* among African Americans when compared to Whites or Hispanics. Shorter time since diagnosis is associated with achieving HbA1c control. Higher level of education is also associated with achieving blood pressure control (Resnick, Foster, Bardsley, & Ratner, 2006).

There are three levels of well-researched factors that contribute to poor diabetes outcomes: 1) patient-specific factors, 2) practitioner level factors, and 3) healthcare system factors. Patient-specific factors include low adherence to self-care practices (Egginton et al., 2012; Frølich, Bellows, Nielsen, Brockhoff, & Hefford, 2010; National Guideline Clearinghouse, 2013; Philis-Tsimikas et al., 2012; Schmittziel et al., 2008; Selby, 2010; Shrivastava et al., 2013; D. V. Wagner, Stoeckel, Tudor, & Harris, 2015). There is a smaller body of research suggesting that patient-specific characteristics may influence specific process CPGs. In one study, SES influenced whether physicians conducted a foot exam, as patients belonging to upper status groups received foot exams more frequently than those belonging to lower status groups (McKinlay, Piccolo, & Marceau, 2013). Practitioner-level factors include a low proportion of patients receiving recommended care (Davidson, 2009; McGlynn et al., 2003; Saaddine et al., 2002; Tulloch-Reid & Williams, 2003), and complexity of care due to comorbidity (Cavanaugh, 2007; Haggerty, Roberge, Freeman, Beaulieu, & Bréton, 2012; Kahn & Anderson, 2009; Kalyani, Saudek, Brancati, & Selvin, 2010; Piette & Kerr, 2006; Tang, Ayala,

Cherrington, & Rana, 2011; Versnel, Welschen, Baan, Nijpels, & Schellevis, 2011). Specific physician characteristics, such as gender or level of experience, appear not to influence frequency of foot exams (McKinlay et al., 2013). Healthcare system factors include limitations of the outpatient care environment—such as insufficient time for clinicians to learn about patients’ needs, lack of appropriate quality measures at the individual level versus population level (Hogg & Dyke, 2011; Ovretveit, 2011; Siminerio, Wagner, Gabbay, & Zgibor, 2009), and changing diabetes care standards (American Diabetes Association, 2011; Cefalu & Watson, 2008; Gandara & Morton, 2011; Meddings, Kerr, Heisler, & Hofer, 2012; Morris, 2000; National Guideline Clearinghouse, 2013).

As is the case with other chronic conditions, the principal goals of diabetes treatment are to prevent the advancement of existing complications and to stave off the development of future complications. Since most diabetic patients will develop and eventually die from macrovascular complications like coronary artery disease, cerebrovascular disease, and peripheral vascular disease, clinical care decisions target controlling metabolic and cardiovascular risk factors for such complications. Control of these risk factors also protects against microvascular complications like nephropathy and retinopathy (Snow, Aronson, Hornbake, Mottur-Pilson, & Weiss, 2004).

Accordingly, to control these risk factors, CPGs aim to support clinical decisions that will result in maintaining blood glucose, pressure control, and lipid target thresholds. To achieve this, standards include recommending dietary practices and physical exercise, as well as oral medications for noninsulin dependent patients. For insulin-dependent patients, recommended treatment options include short- or immediate-acting insulin at

specified times during the day, in addition to oral medications for blood and cholesterol control as appropriate, and dietary and exercise guidelines (Evert et al., 2014; Kirpitch & Maryniuk, 2011; Todd, 1998). Smoking cessation is also strongly recommended for *all* T2DM patients (Nagrebetsky, Brettell, Roberts, & Farmer, 2014).

Gaps Addressed in This Study

In summary, process and target CPGs focus on specific clinical decisions, such as frequency of performing the HbA1c test and target thresholds, while at the same time recognizing the ambiguities and challenges of applying these guidelines to specific cases. Despite what is known of target CPGs (i.e., HbA1c < 7), the focus of this study, little is known as to how practitioners' perceptions of psychosocial factors influence CPG applicability depending upon patient circumstance. Because psychosocial factors are an important source of ambiguity and challenge in the application of CPGs, this research addresses the second part of the third research question:

RQ3: How do practitioners use psychosocial information? How does this information influence their specific care decisions?

2.5. Clinical Decision Making

Theoretical Perspectives on Clinical Decision Making

In this section, I provide a brief overview of theoretical models of clinical decision making focused on information use. Several theoretical frameworks describe how clinical decisions are made. They explain clinical information usage and information sources, attempting to depict how clinical information is stored and retrieved. They all posit that clinical knowledge exists at various levels. Practitioners' knowledge expands as clinical expertise is developed and as the practitioner encounters various patient

situations. I briefly describe three theories for clinical information use: the physical system theory, the theory of expert cognition, and the cognitive continuum theory—an established theory used to examine information use for clinical decisions in the primary care setting. In order to situate my research in the clinical decision making literature and describe the gaps it addresses, I then discuss the limitations of these existing models.

The Physical System Theory

The physical system theory posits that clinical information is stored mentally as symbols that represent objects, events and associations between these elements (Kassirer, Wong, & Kopelman, 2010). It is not clear *how* these symbols are formed nor *how* they are used; however, the prevailing position is that these symbols are formed through production rules, frames, and illness scripts. The production rule, also known as condition-action pair, states that the symbols are stored and used in an IF-THEN format. The IF portion represents a familiar condition—like symptoms consistent with disease progression; the THEN portion is the action to be taken whenever the IF condition is observed. The result could trigger a decision to treat the complication resulting from disease progression (Kassirer et al., 2010). A frame is a decision tree, a hierarchical structure using information to address a given clinical situation. The illness script is a complex description of a particular clinical visit, like the primary care clinical visit (Gigante, 2013; Monajemi, Rostami, Savaj, & Rikers, 2012). The theory assumes that the practitioner can recall from memory individual, specific “cases,” versus general models of disease progression. Each new case is evaluated by recalling example cases, called “exemplars,” which inform decisions on each new case. Associations between elements can also occur via pattern recognition. Pattern matching occurs when the physicians

recognizes forms of contextual information, such as patients who present with specific symptoms, to inform clinical decisions (Monajemi, Schmidt, & Rikers, 2012).

The Theory of Expert Cognition

The theory of expert cognition is a complex model that attempts to describe information use in clinical thinking (Dreyfus, Dreyfus, & Athanasiou, 1986). The theory describes various phases of skill acquisition in the clinical context. Clinical expertise is primarily developed through experience with numerous patient situations, commonly referred to as “clinical cases”. The model is appropriate for understanding the development of medical students as they progress in their training from resident to clinical expert as it describes the development of clinical expertise through numerous clinical situations, informed by patient outcomes and input from colleagues.

The Cognitive Continuum Theory

The cognitive continuum theory is an enduring model, frequently applied to understanding information use for clinical decisions in the primary care context. It has three dimensions which attempt to incorporate the different types of thinking, and how it may be applied to different decisions: 1) structure (well-structured to ill structured), 2) cognitive mode (intuition to analysis), and 3) time required (high to low) (Custers, 2013; Hamm, 1988; Offredy, Kendall, & Goodman, 2008). The theory provides a general framework to understand how a continuum of cognition and psychological processes are associated with this expansive perspective of clinical decision making. I now describe each of the three categories.

Structure

Task structure is dependent upon two factors: ambiguity and complexity. Structure has an inverse relationship with ambiguity and complexity. Highly structured decisions are characterized by low ambiguity and complexity. Degree of ambiguity is dependent on the availability of information which can help inform the clinical decision; accessibility is highly dependent upon how the information is organized. Complexity is dependent upon the number of information cues available which the practitioner believes should be considered in care decisions. For diabetes care decisions, several cues may be required and information may or may not be available at the specific point when choices are presented (Thompson, Cullum, McCaughan, Sheldon, & Raynor, 2004). For example, the common clinical decision concerning adjusting insulin treatment based on information from an HbA1c test may depend on the availability of additional clinical *and* psychosocial information such as: the patient's response to previous dosage adjustments; their self-care practices in administering the recommended doses; and speculation on future patient self-care practices in administering the doses which may include assessment of psychosocial barriers.

Cognitive Mode

Cognitive mode is based on the observation that clinical decisions—particularly those in the primary care setting—are neither purely based on intuition nor evidence-based information. As cognitive science began describing the human mind as an information processing system, decision scientists and cognitive psychologists developed the notion that clinical decisions occur on a *continuum* from intuition to analysis; position on the continuum defines the cognitive mode. Intuitive decisions rely on perceptions and

assumptions, and are less reliant on evidence-based information; analytical decisions rely on evidence, making them less reliant on intuition (Hamm, 1988; Thompson et al., 2004).

Time Required

Time required to make the decision is influenced by several clinical factors. They include the level of practitioner collaboration with the patient for a clinical decision, and the information exchanged between practitioners. The level of collaboration with the patient can vary based on caregiver or support network involvement in the decision. Information exchange can vary based upon the number of practitioners that comprise the care team of a particular practice.

Limitations of Existing Models

These models do not entirely describe the complex, contextual relationship between the various types of clinical decisions and specific psychosocial information processing and use. For example, several additional contextual factors influence information use, such as: the nature of the clinical decision; patient-specific psychosocial information; the number of decisions made and the timeframe in which to make them; the amount and priority of contrary clinical information available to the practitioner; and how the information is organized and displayed (Lomas & Haynes, 1988; Rycroft-Malone et al., 2004; Thompson et al., 2004; Weiner et al., 2010).

Gaps Addressed in This Study

These limitations illuminate the gaps that this work can fill. As I described in section 2.3, there are various psychosocial factors that define the patient situation, particularly as it pertains to diabetes self-care behavior. There is a need for a model to describe how psychosocial information is used for patient-centered diabetes care

decisions. To address this need, I investigate the following research question, the first part of the third research question:

RQ3: How do practitioners use psychosocial information?

2.5.1. Clinical Information Access for Clinical Decision Making

Although there is a vast body of literature on clinical information access for decision making previous work does not discuss the unique case of psychosocial information. I now summarize this relevant prior literature of the sources of clinical information which is not exclusively psychosocial, and how that information is accessed. I briefly outline the literature on information seeking and conclude this section with an overview of the literature concerning unmet information needs.

Overview

Clinical information typically focuses on the physical manifestations of patient health, and may include subjective information such as the patient's description of their complaint and objective information such as laboratory or other diagnostic tests and findings from a physical examination. Clinical information gathering can vary widely within the primary care setting; it is not conducted according to a specific pattern during the clinical visit. For experienced practitioners, typically information is initially gathered from the medical record—which includes laboratory results—then the physical exam, then from the patient (Kassirer et al., 2010). But clinical information also may be first presented during the patient exam (i.e., physical appearance, gait), then from the laboratory results (i.e., HbA1c, LDL), then from the consultation (i.e., pain, vision issues). The use of other sources, such as peers, may also be woven into practitioners' information seeking behavior.

Electronic Health Record (EHR)

The electronic health record (EHR) is a key source of information used in clinical decision making. In the outpatient setting, physicians order diagnostic tests and use information from their results, which are captured and displayed in the medical record, to inform clinical decisions (Veinot, Zheng, Lowery, Souden, & Keith, 2010). Primary care physicians in the outpatient setting seek information most frequently about a specific clinical situation, particular to the specific patient's situation (Covell, Uman, & Manning, 1985; Del Fiol, Workman, & Gorman, 2014).

The EHR can be both a barrier and a facilitator of information exchange in the outpatient care setting (Shachak & Reis, 2009). EHR tools affect care delivery as facilitators or barriers to the quality of communication during clinical consultation, subsequently impacting health outcomes (Asan, Montague, & Xu, 2012; Haskard, Williams, & DiMatteo, 2009; Veinot et al., 2010; Ventres et al., 2006). EHR use can present barriers to effective practitioner-patient communication because it can hinder dialogue and reduce focus on the patient, key aspects of patient communication (Makoul, Curry, & Tang, 2001; Margalit, Roter, Dunevant, Larson, & Reis, 2006; Ventres et al., 2006). Yet practitioner use of the EHR can also facilitate communication through improved access to patient information—particularly concerning medications—expressly important in care for patients with multiple prescriptions (Arar, Wen, McGrath, Steinbach, & Pugh, 2005; Ash et al., 2007; Doyle et al., 2012; Lelievre & Schultz, 2010; Shield et al., 2010). EHR use in the exam room can have positive effects on patient satisfaction, a key health outcome (Irani, Middleton, Marfatia, Omana, & D'Amico, 2009).

Computerized Decision Support Systems (CDSS)

In general, Clinical Decision Support Systems (CDSS) aim to support clinical decision making by standardizing them. Standard decisions couple the individual patient circumstances with the evidence-based research (Berg, 1997; Dowding, 2008; Tierney, Overhage, & McDonald, 1996). These systems vary in their features and capabilities. In general, they utilize rules and/or statistical formulas to make expert knowledge accessible to the practitioner at the point of the care. They can be implemented as ‘passive’ systems that provide information only when requested by the practitioner, or as ‘active’ systems that automatically provide information. CDSS use alerts and reminders based on practice guidelines. These electronic reminders are integrated into the medical record to provide practitioners with recommendations for preventive services and clinical targets (Nemeth, Ornstein, Jenkins, Wessell, & Nietert, 2012; Strayer, Shaughnessy, Yew, Stephens, & Slawson, 2010).

Peers

In the primary care setting, nurses tend to perceive colleagues as more useful sources of supplemental information (i.e., not contained in the EHR) for clinical decisions rather than published research, including peer-reviewed journals, websites, and pamphlets. Also, physicians consult with other physicians and health professionals most frequently. Physician peers are a more common source of information regardless of type of outpatient care practice (Covell et al., 1985; Kahane, Stutz, & Aliarzadeh, 2011).

Gaps Addressed in This Study

Although the above literature highlights the importance of several sources of clinical information for primary care practitioners, research has not yet addressed the

specific case of psychosocial information. However, this is important since psychosocial information, as described previously, is unique in that it tends to be qualitative and situation-dependent. Prior research in an inpatient setting showed that psychosocial information has a tendency to go undocumented (Zhou, Ackerman, & Zheng, 2009)—suggesting that access to such information may be different than access to clinical information currently collected. Moreover, prior research has detailed the *sources* of information that clinicians use, with less attention accorded to the methods by which practitioners acquire information from such sources. A clearer understanding of how practitioners currently access pertinent psychosocial information will help support the use of psychosocial information in outpatient chronic care. By enhancing practitioners’ understanding of psychosocial factors and specifically *how* psychosocial information is different from clinical information currently collected and used, will help achieve the expansive goal of better collection and use of that information. To address these areas of uncertainty, this study investigates the following research question:

RQ2: How do practitioners access psychosocial information?

2.6. Gaps in Understanding Psychosocial Information Access and Use

I conclude the literature review with an overview of specific gaps in understanding three potential areas of influence on psychosocial information access and use: situations, practitioner characteristics, and facilitators and barriers. I use this discussion of gaps to situate my remaining research questions in the literature. Although the literature I summarized concerning clinical decision making and CPGs is quite extensive concerning general clinical information use, the literature is comparatively sparse concerning the influence of *psychosocial* information on clinical decisions.

Practitioner Perspectives on Psychosocial Factors

Practitioners do not necessarily feel equipped to address psychosocial needs (Institute of Medicine, 2008b). In a national survey of primary care physicians, only 20% of respondents indicated that they felt confident in their ability to address the social needs of their patients which affect health outcomes. Also, 75% indicated that the health care system should support providing access to support services for patients—if they determine that lack of social support presents barriers to care. Physicians indicated that if they could write *prescriptions* for social support, as they do for medications, they would write prescriptions to support: transportation assistance, access to healthy foods, and exercise programs (Robert Wood Johnson Foundation, 2011).

Psychosocial Information Currently Used

Practitioners acknowledge the importance of improving the collection and use of psychosocial information (Robert Wood Johnson Foundation, 2011), but neither prompts for consideration, nor sources of psychosocial information, are consistently described in the literature for diabetes clinical decisions. Patient-specific situations appear to prompt practitioner consideration of psychosocial factors (Weiner, 2004; Weiner et al., 2010). Weiner has suggested a three-step framework for practitioners to avoid “contextual errors” in identifying these situations which stem from improperly incorporating the patient’s situation into the clinical decision. The three suggested steps are: 1) effectively discern contextual cues, rooted in psychosocial factors (i.e., financial strain, social support, culture, mental health status), 2) be aware of one’s own perceptions that may bias recognition of the cues, and 3) take a systematic approach to confirm results of their clinical decisions from multiple sources.

Recent published literature on “contextual errors” describes how practitioners use the medical record to identify when patients do not achieve glycemic control. In this situation, practitioners may *perceive* that psychosocial issues are present, prompting consideration for psychosocial information such as: transportation needs, SES stressors, and demands from daily activities (Weiner et al., 2014). Practitioners may also use the medical record to assess medication adherence, reviewing patients’ refill patterns to help determine medication self-care behavior (Veinot et al., 2010).

The literature has offered suggestions for reducing “contextual errors” in assessing psychosocial factors that may help define the patient’s situation, but the literature does not describe when practitioners currently access, and use psychosocial information to make, or to influence, their diabetes clinical care decisions in the outpatient setting. Therefore, the research presented here investigates the following research question:

RQ4: In which situations are psychosocial factors considered?

Practitioner Role and Use of Psychosocial Information

The type of practitioner role appears to influence use of psychosocial information. Nurses are more likely than physicians to collect and use psychosocial information. They more frequently believe that psychosocial factors influence self-care practices and attempt to provide, or make referrals for, support for addressing psychosocial barriers (Funnell, 2006; Peyrot et al., 2006). Also, nurse practitioners report conferring with nurse practitioner peers—rather than reference manuals, or physicians—concerning ways to address psychosocial barriers (Rasch & Cogdill, 1999). Since practitioner role appears to have an influence on perception of relevance of psychosocial factors, and may influence

resulting clinical decisions, I seek to investigate any associations between practitioner role and psychosocial information use. Insights on differences between practitioner roles will help inform the development of capabilities to provide access to psychosocial information when it is most needed. This is the focus of the fifth of my six research questions:

RQ5: What practitioner characteristics (i.e. role, age) are associated with their use of psychosocial information?

Current Tools in Support of Psychosocial Information Use

Practitioners across specialties acknowledge the need for better collection, analysis, and use of psychosocial information. There are various recommendations to expand current capabilities of the electronic health record (AHIMA, 2014; Chunchu, Mauksch, Charles, Ross, & Pauwels, 2012; Institute of Medicine, 2014a, 2014b; Krist et al., 2014b; Pearson, Brownstein, & Brownstein, 2011; Zhou, Ackerman, & Zheng, 2010). The EHR should include capabilities to access and use psychosocial information, which the patient should be closely involved in providing. Recommendations to enhance EHR capabilities to document and use psychosocial information such as a patient's emotional health and stressors. These factors are important to help inform clinical decisions (Estabrooks et al., 2012; Glasgow, Kaplan, Ockene, Fisher, & Emmons, 2012).

In a national survey of 1,000, primary care physicians identified access to three psychosocial-related needs critical to influencing patient health outcomes: fitness programs, healthy foods, and transportation. A large majority of respondents (85%) indicated that they do not feel confident in currently available tools to assess and address patients' social needs which influence health outcomes, such as access to: safe housing, transportation, and healthy foods. For physicians who practice in low-SES areas, 95%

indicated they do not feel confident in addressing these needs (Robert Wood Johnson Foundation, 2011).

Electronic health records could better support primary care by documenting social needs. The current, common practice of collecting information on family social history is not sufficient (Klinkman & van Weel, 2011). A consensus statement from the American Academy of Family Physicians (AAFP), American Academy of Pediatrics (AAP), American Board of Family Medicine (ABFM), and North American Primary Care Research Group outlined patient-specific information needs in the primary care setting, which include psychosocial information (i.e., social support, occupational information) (Krist et al., 2014a). They acknowledge that current information collection practices are not suitable for a robust understanding of patients' situations, which is necessary for providing patient-centered care (Evans & Trotter, 2009).

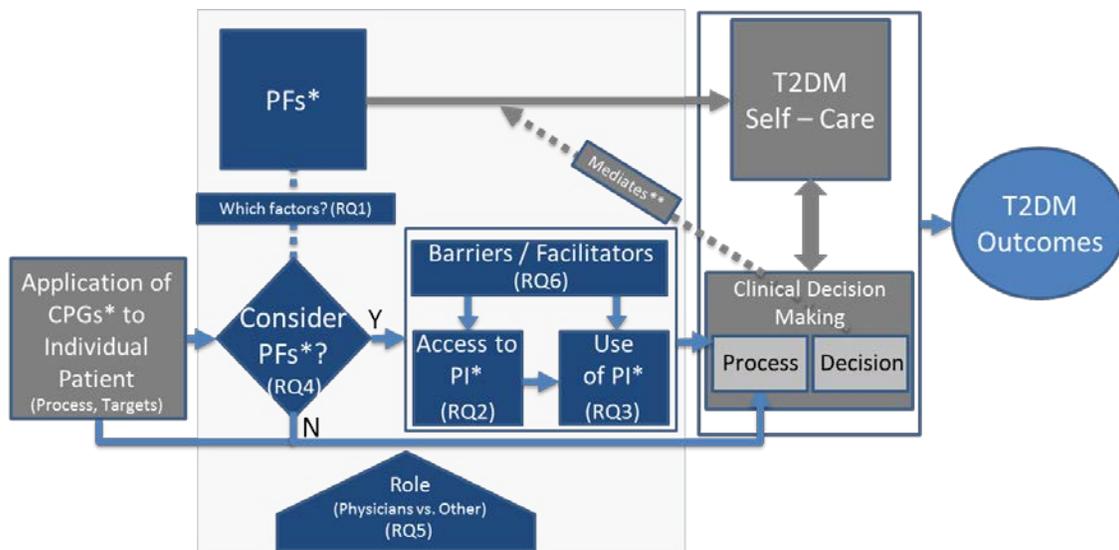
Improving the capture and use of psychosocial information would help practitioners assess and respond to barriers to healthy self-care practices. First, practitioners must have the tools to support the assessment of self-care behavior and the factors that may impede motivation and capabilities. Second, they must work with the patient, and caregivers as appropriate, to collaborate on a plan of action that is informed by the patient's situation. Third, they must have the tools to create and monitor clinical *and* psychosocial health in order to provide ongoing assessment and support (Heisler & Resnicow, 2008).

Despite this body of extant research, prior research is disjointed with respect to understanding the full range of barriers and facilitators of the use of psychosocial information in outpatient care. Moreover, prior work has scarcely considered issues of

current modes of documentation of such information. The final research question purports to fill these gaps:

RQ6: What are the barriers and facilitators to acquiring and using psychosocial information? How effectively do current tools (templates, data fields, free text) support the storage and retrieval of psychosocial information?

I now revisit the initial conceptual framework introduced in section 2.2. In the updated conceptual framework (see Figure 2.6) I have replaced the black box in the initial conceptual framework (see Figure 2.2) with the specific knowledge gaps in the literature, according to each of the six research questions which represent the focus of this study.



- * - PFs – Psychosocial Factors
- * - PI – Psychosocial Information
- * - CPGs – Clinical Practice Guidelines
- ** - Clinical Decision Making mediates influence of PFs on self-care (i.e., when recommending resources for food, housing, etc.)

Figure 2.6: Conceptual Framework of Psychosocial Factors in Outpatient Diabetes Care

Summary

Practitioners must have consistent access to psychosocial information to understand if psychosocial factors may be influencing a patient’s diabetes self-care

behavior. In order to do so, the practitioner must understand what psychosocial factors influence self-care, how to access them, and how to use psychosocial information to inform diabetes clinical decisions. Further, they must determine when patients' circumstances warrant consideration.

Little is known about practitioner perceptions of the importance of psychosocial information, nor how it is accessed and used at the point of care. Further, little is understood about the sources of this psychosocial information, and the barriers and facilitators to its use. This study attempts to fill these gaps in order to better support clinical decision making, and ultimately improve outcomes for outpatient diabetes care.

CHAPTER 3

RESEARCH DESIGN

We don't receive wisdom; we must discover it for ourselves after a journey that no one can take for us or spare us.

— Marcel Proust (1871–1922)

This study followed a mixed methods design. Combining qualitative and quantitative methods is valuable, as it leverages the strengths of both approaches (Curry, Nembhard, & Bradley, 2009). I selected the exploratory sequential design, in which qualitative data is collected first, and emphasized throughout the study (Creswell, 2013). In the first phase, I used the grounded theory approach in collecting and analyzing the data from seventeen in-depth, semi-structured interviews with physicians, conducted in five states (Charmaz, 2006). The results of this analysis informed the design of the online survey. The online survey enabled me to explore if data gathered from physician interviews can be generalized to a larger sample of practitioners, and to assess relationships between variables. The specifics of the research design are outlined below.

3.1. Research Plan / Approach

As depicted in Figure 3.1, I collected qualitative data in an initial phase (Creswell, 2013; Fetters, Curry, & Creswell, 2013). The qualitative data served to identify which categories are present in the data; I conducted the qualitative phase once I reached “saturation”, a situation in which analysis ceases to generate new categories (Corbin & Strauss, 2007; Guest, Bunce, & Johnson, 2006; Ogedegbe, Mancuso, Allegrante, &

Charlson, 2003). I reached saturation after seventeen in-depth, semi-structured interviews with physicians.

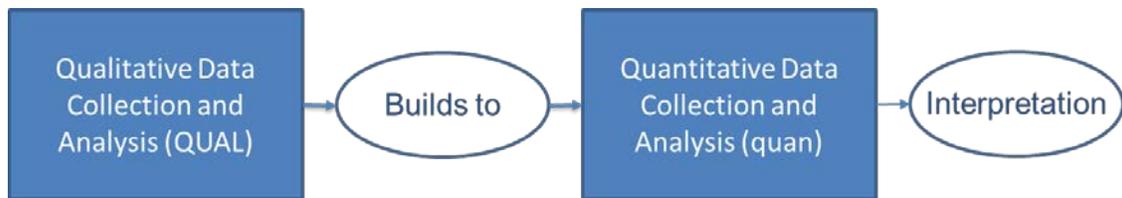


Figure 3.1: Exploratory Sequential Study Design (based on Creswell, 2013, p. 220)

* - CAPS are used to show emphasis on qualitative data

The qualitative data collection and analysis was followed by quantitative data collection and analysis, which served to assess the prevalence of the categories identified in the interview analysis, and to assess relationships between variables. To assess generalizability, the online survey sample is comprised of 229 participants in various practitioner roles, including physicians (MD and DO), physician assistants (PA), nurse practitioners (NP), registered nurses (RN), registered dieticians (RD), clinical pharmacists, and other practitioner roles.

3.2. Timeline

I began the investigation in February, 2014 by conducting the initial interviews for the pilot data collection and analysis, as shown in Figure 3.2. I continued recruiting study participants and conducting the interviews through the summer of 2014. I performed the interview data analysis, which helped inform my follow-up probes. I constructed and built the survey instrument in fall of 2014, and launched it in November. I analyzed the survey responses in late 2014, through the spring 2015. I began writing the findings in the late spring, early summer of 2015.

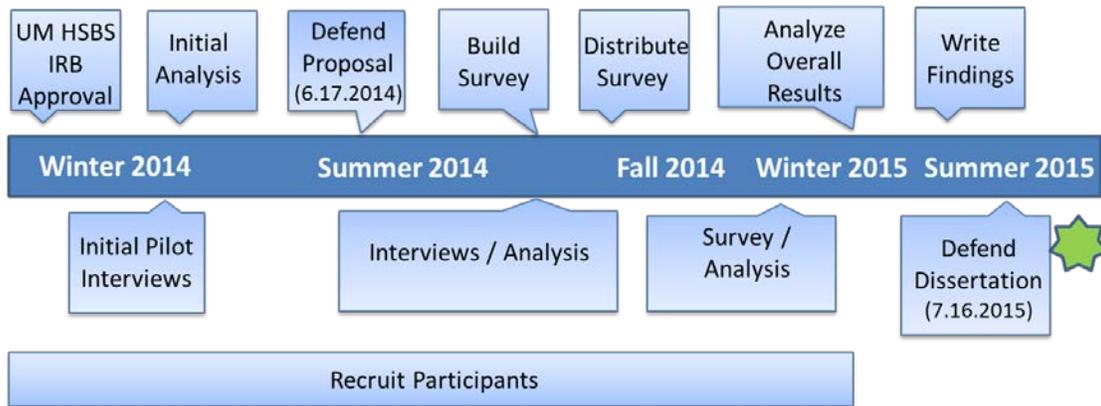


Figure 3.2: Study Timeline

3.3. Study Population, Sampling Plan & Participant Recruiting Methods

The target population for this study was practitioners who self-report experience treating adult, T2DM patients in the outpatient setting. Eligibility did not depend upon timing for providing this care. For example, a participant may be making, or providing input into, these clinical care decisions in their *current* role, or they may have *done so during their past* clinical experience. My population of interest is practitioners from various parts of the United States.

Study Participants

I chose to focus on physicians in the beginning of the study, given their central role in clinical decision making. My interview participants are *physicians* who indicate they have experience treating adult, T2DM patients (see Appendix E: *Interview Participants*). I included both medical doctors (MDs) and doctors of osteopathic medicine (DOs), including residents and fellows, with diversity of experience in providing care for T2DM patients, according to the sampling strategy detailed below. I

conducted these interviews on site at the physicians' preferred location. The interviews took place in five states: California, Indiana, Michigan, Rhode Island, and Texas.

As I continued the study, I decided to include additional practitioner roles in the quantitative step in order to obtain perspectives from a wider group. The online survey was distributed to a larger, more diverse sample of practitioners which included: physicians (MD and DO), resident physicians, physician assistants (PA), nurse practitioners (NP), registered nurses (RN), registered dieticians (RD), and clinical pharmacists. In order to sample a diversity of practitioners, these participants were recruited from three sources: 1) Genesis Physicians Group, 2) North Texas Nurse Practitioners, and 3) Michigan Association of Diabetes Educators.

Genesis Physicians Group

Genesis Physicians Group (Genesis) is based in North Texas. Genesis is North Texas' largest independent practice association (IPA). Genesis has 1,400 physician members, 450 who are primary care physicians. Genesis supports its physician members by helping them manage their practices, focusing on enhancing economic value (Genesis Physicians Group, 2015).

North Texas Nurse Practitioners

The North Texas Nurse Practitioners (NTNP) is a 700 member professional organization in the North Texas region. It is recognized as an affiliate member of the Texas Nurse Practitioners (TNP) and the American Association of Nurse Practitioners (AANP). The NTNP is a non-profit organization that provides local networking opportunities, and encourages the educational and professional advancement of its members. It is active in precepting and mentoring activities, and especially focuses on

informing the general public of the nurse practitioner profession (North Texas Nurse Practitioners, 2015).

Michigan Association of Diabetes Educators

The Michigan Association of Diabetes Educators is an affiliate of the American Association of Diabetes Educators (AADE). The affiliate has approximately 400 members across Michigan. The AADE network helps facilitate communication throughout its affiliates, at the state and local level. The AADE also has communities of interest (COI) based on professional practice areas (American Association of Diabetes Educators, 2015).

Sampling Plan and Recruitment

In keeping with the principles of grounded theory (Bryant & Charmaz, 2007), my sampling and recruitment was driven by the phenomena I was seeking to investigate. I targeted practitioners with experience treating complex, T2DM patients in outpatient care settings. Complexity is determined by the presence of comorbid conditions, and low-resourced individuals – especially from ethnic minority groups.

Interview Sampling

My sampling approach for interview participants followed a multi-phased, grounded theory sampling strategy. I used convenience sampling during the pilot phase of the research—sampling the most *accessible* study participants—for the initial six study participants (Marshall, 1996). These individuals were recruited through my personal and professional network. The pilot phase study participants represented various levels clinical experience (2nd year resident to 19 years), geography (central to eastern United States), and training (family medicine, internal medicine, endocrinology). My preliminary analysis of the pilot interview data revealed that physicians consider the

following psychosocial factors in their clinical decision making process: socio-economic status (SES), culture, immigrant status, and comorbidity (complexity based on multiple chronic conditions, including mental health conditions such as depression, and that the EHR played an important role in the use of psychosocial information. According to grounded theory, I then used purposeful sampling based upon how the interview participants described psychosocial factors and their use. In particular, sampling sought variations in levels of experience to understand how the advent of EHR tools impacted participants' ability to document and use psychosocial information, a key theme that emerged in the early physician interviews. Last, I used theoretical sampling according to my emerging theory (Morse, 2010). This included sampling based on experience with patients who are poorly controlled, from low-resourced areas, and have a low ability to pay for treatment.

Survey Sampling

Survey participants are individuals who make, or provide input into, diabetes care decisions in the outpatient care setting. The population of interest includes practitioners across the United States who self-report either making T2DM clinical care decisions, or *providing input* into, these clinical care decisions that are made by others (e.g., a registered nurse who provides input into a physicians' referral or prescribing decisions). To increase the odds of finding practitioners with relevant expertise, I sampled primary care physicians and members of a professional organization of diabetes educators, many of whom are nurses. I also included a nurse practitioner professional organization to ensure perspectives from diverse practitioner roles.

Response rates have steadily declined from 2000 – 2012 for large-scale surveys conducted with various medical practitioners (Klabunde, Willis, & Casalino, 2013;

Wiebe, Kaczorowski, & MacKay, 2012). Therefore, I referred to the extensive literature on maximizing response rates for healthcare professionals, specifically physicians (Cho, Johnson, & VanGeest, 2013; Grava-Gubins & Scott, 2008; Hawley, Cook, & Jensen-Doss, 2009; Jansen et al., 2005; Thorpe et al., 2009; VanGeest, Johnson, & Welch, 2007; P. M. Wilson, Petticrew, Calnan, & Nazareth, 2010).

This literature revealed the potential value of identifying peers to help promote survey engagement; this approach has been used in administering online surveys to healthcare practitioners (Grava-Gubins & Scott, 2008). Therefore, I recruited survey “champions” within each of the three groups to support survey distribution and maximize response rates. Survey champions are influential peers, and recognized leaders in the survey sample. My specific approaches for subsample are identified below.

Survey Sampling – Genesis Physicians Group

The Chief Executive Officer (CEO) of Genesis Physicians Group served as survey champion for the primary care physicians survey sample. Working closely with him, I developed a survey recruitment strategy integrated with the launch of their Accountable Care Organization (ACO) initiative, which includes segmenting their 113 primary care physicians into six groups, called PODS. Each of these six PODS are led by Associate Medical Directors (AMDs), who serve various roles, including communicating with their PODS important information about the progress of the ACO initiative. The online survey represented the first major communication from the AMDs to their PODS. The Genesis CEO served as the champion for informing the AMDs about the survey, and distributing reminders to their PODS to complete the survey.

Survey Sampling – North Texas Nurse Practitioners

The president of the North Texas Nurse Practitioners (NTNP) professional organization served as the survey champion for this group. I worked with her to familiarize her with the study objectives, and articulate specifically what I was seeking from the survey sample. The president provided me with their 257 membership distribution list, which included email addresses. This was essential to tracking individual responses.

Survey Sampling – Michigan Association of Diabetes Educators

An eminent member served as the champion for the Michigan Association of Diabetes Educators. The membership list was not available to me or the champion. However, the survey champion sent the survey email, which included a link to the survey, to their Listserv, an electronic email list used for communication to all 399 members. Please see Appendix F: *Emails Used for Survey Distribution* for the emails used for survey distribution.

3.4. Data Collection

The sample for the qualitative (interview) data was distinct from the sample for the quantitative (survey) data, and the interview sample population is smaller than the survey sample. I purposively minimized the time between the interview data collection and analysis, and the survey construction and distribution (Harris & Brown, 2010).

3.4.1. In-Depth, Semi-Structured Interviews

I conducted individual, in-depth semi-structured interviews (Lillrank, 2012; O'Reilly, 2012), in a private location. The interviews generally lasted between 45 minutes to one hour. The average length of the interviews was 58 minutes, 33 seconds. The shortest interview was 34 minutes, 50 seconds (P03); the longest interview was one hour,

20 minutes, and 49 seconds (P15). Informed by the extant literature, I used open ended, main questions and follow-up probes (see Appendix G: *Semi-Structured Interview Guide*). I selected this approach because it is well-suited for collecting information from participants about a *specific topic* (Britten, 1995; Hesse-Biber & Leavy, 2010).

Prior to the interview, I informed each participant of the purpose of the study, and obtained their informed consent. I kept a separate file containing identifying information in a secure location on a password-protected computer using my University of Michigan Google drive account.

Insights gleaned from the initial interview participants helped guide my probes in subsequent interviews. I continued to conduct interviews until my analysis reached saturation. All interviews were conducted face-to-face. The participant determined the location; I traveled to their preferred location.

All interviews were transcribed verbatim. I used Scribie, an external transcription service. All interview transcripts were de-identified, and interview participants were given an anonymous ID number (i.e., P01).

3.4.2. Survey Design

The survey is a common research tool used across numerous areas of research. There is a common process to its design. Groves et al. (2011) outline the process, which I have adapted and depicted in Figure 3.4.2. In this section, I will describe how I constructed the survey, and validated it using cognitive interviews. The recruitment and sampling plan have been described in section 3.3. I describe how I analyzed the survey data in section 3.5.



Figure 3.4.2: Survey Design Process (based on Groves et al., 2011, p. 47)

I constructed the survey instrument based on the categories identified in the interview data. Specifically, the survey asked about what psychosocial factors practitioners use, their relative priority, what decisions are influenced by these factors, and what triggers their consideration. I also asked respondents to identify their information sources for psychosocial information, their practice setting, and what clinical decisions they personally make, or provide input into. This was important because nurse practitioners, physician assistants, and clinical pharmacists may not make, or provide input into the same clinical decisions as physicians across practice settings. Additionally, allied health professionals may find themselves providing input into, but not themselves ultimately making, decisions that lie within the scope of practice for practitioners with prescribing authority. Further demographic details, such as years of practice, were also gathered to characterize the survey sample.

In constructing the survey questions, I followed proven principles of writing good questions based on the survey methodology literature (Passmore, Doobie, Parchman, & Tysinger, 2002). Key principles include:

- Use simple words, that all respondents will understand
- Use memory cues to improve recall
- With closed questions, include all reasonable, possible responses

For additional detail please see Appendix J: *Principles of Survey Instrument Design*.

Validating the Survey Instrument – Cognitive Interviews

I validated the survey instrument prior to finalizing and distributing the survey using the cognitive interview approach. Cognitive interviews have been used to pretest health surveys prior to distribution (Drennan, 2003) and I believed the approach was suitable given the complexity of the research topic.

Therefore, I used cognitive interviewing to pretest the questions in order to detect any issues with clarity or meaning (Beatty & Willis, 2007; Sherman et al., 2014; Willis, 2005). Cognitive interviewing entails administering the survey to a portion of the sample population, while collecting additional verbal information about the survey instrument (Beatty, 2003). I ensured quality of responses by confirming that the questions were well understood and easy to answer (Groves et al., 2011; Jansen et al., 2005). I also assessed how well the answers corresponded to what I intended to measure. I confirmed that all questions followed three standards: 1) *content* standards—the questions ask about the right elements, 2) *cognitive* standards—the respondents understand the questions and have the information required to answer them, and 3) *usability* standards—respondents can complete the survey easily (Groves et al., 2011; Squires et al., 2013).

I conducted seventeen cognitive interviews from September 25, 2014 through October 15, 2014 (see Table 3.4.2). Each of the following clinician roles were represented in the cognitive interviews: physician, physician assistant, nurse practitioner, registered nurse, and clinical pharmacist. The interviews lasted an average of 33 minutes, 32 seconds; the longest lasted one hour, 40 minutes; the shortest lasted 19 minutes. During the cognitive interviews, I gained feedback based on what the respondents thought as they reviewed the questions. I made the specific adjustments to the survey based on feedback in the following areas: survey look and feel (e.g., finalized groupings

of clinical decisions), clarity of wording of questions and answer choices (e.g., added context on circumstances when psychosocial factors are important), and specific content changes (e.g., added “selecting generic vs. brand” to medications decisions answer choices). I recorded these interviews and referred back to them as needed prior to finalizing the instrument. Please see Appendix H: *Survey Instrument*.

	In Person	Telephone	TOTAL
Clinical Role			
Physician	2	1	3
Physician Assistant	0	3	3
Nurse Practitioners	1	4	5
Registered Nurse	0	4	4
Clinical Pharmacist	1	1	2
TOTAL	4	13	17

3.4.3. Survey Distribution and Administration

I used Qualtrics software to create the instrument and distribute the online survey via email, and collect the data (see Table 3.4.3). I used the University of Michigan email survey for all correspondence with the survey participants. The email system is protected with password access. I assumed that all study participants were familiar with standard email security protocols. I introduced the survey in the survey email, and I informed the participant of the purpose of the study and obtained their informed consent. As I did with the interview data, I kept a separate file containing identifying information for survey participants in a secure location on a password-protected computer using my University of Michigan Google drive account.

I received my first survey response on November 20, 2014, and my last response on May 5, 2015. Since the survey was distributed via email, I identified the purpose of the study, why they were being contacted, identified the survey “champion” for the

particular subsample, and gave the recipients the option of removing their email address from the distribution. Please see Appendix F: *Emails Used for Survey Distribution* for emails used to distribute the survey instrument.

Table 3.4.3 – Survey Distributions

	Sent by	Sent From	Date / Time (ET)
Genesis Physicians			
Initial Email Sent to (6) AMDs	Champion	Qualtrics	2.3.2015 3:55pm
Email Sent to PODs	AMDs	Qualtrics	2.5.2015 10:00am
Reminder Fax	Champion	Genesis Fax	3.6.2015
Reminder Email	AMDs	Qualtrics	3.6.2015 6:00pm
Reminder Email	Champion	Qualtrics	3.11.2015 10:00am
Reminder Letter	Champion	Postal Mail - Dallas	4.7.2015
North Texas Nurse Practitioners NTNP			
Initial Email	Champion	Qualtrics	11.20.2014 10:00am
Reminder Email	Champion	Qualtrics	12.4.2014 10:23am
Reminder Email	Champion	Qualtrics	12.18.2014 12:16pm
Reminder Email	Champion	Qualtrics	1.5.2015 10:00am
Reminder Email	Champion	Qualtrics	1.20.2015 1:33pm
Michigan Diabetes Educators			
Initial Email	Champion	To Listserv	12.2.2014
Reminder Email	Champion	To Listserv	12.18.2014
Reminder Email	Champion	To Listserv	1.5.2015
Reminder Email	Champion	To Listserv	1.23.2015

Note: reminders were only sent to non-respondents for Genesis and NTNP.

3.5. Data Analysis

Separate data analyses were conducted for the two phases of the study; these are outlined below.

3.5.1. Interview Analysis

I used the grounded theory approach to code, summarize, and condense the data (Charmaz, 2006). I selected this approach because it is well suited for analysis of the interview data (Charmaz, 2006), and because it is conducive to understanding how a process works (Creswell, 2006). I applied this approach to understanding the psychosocial and situational factors used in the decision process in the course of patient-centered diabetes care decisions.

I coded the interview transcripts using NVivo version 10.0 qualitative data analysis software. My objective was to find repetitive patterns, focused on the psychosocial factors, the triggers of consideration, and how they are used. I coded line-by-line to segment the data and link the patterns I identified. Coding is a cyclical process, enabling the refinement and highlighting of patterns to generate categories and concepts. I followed a coding process consistent with grounded theory. I did line-by-line coding in the initial coding phase, using in vivo codes to capture the physicians' meanings (Glaser, 1978). I summarized basic topics in a word or short phrase, using gerunds to help me investigate processes (Miles, Huberman, & Saldaña, 2014; Saldaña, 2009). In the second coding cycle, I used axial coding to define conditions and actions (Corbin & Strauss, 2007). Consistent with grounded theory, in this second cycle, I developed categories for the first cycle codes, an approach well suited to apply meaning to the data (Miles et al., 2014; Saldaña, 2009).

I calculated interrater reliability to determine the extent to which multiple coders agree. I had a second coder code selected interview transcripts; 24% of the interview transcripts were randomly selected by the second coder, four of the total seventeen. The interrater reliability (IRR) between the second coder and I was 98.436% for all codes

used in the interview data analysis. This is above the generally recommended 90% threshold (Di Iorio, 2006).

I used memos and diagrams to describe the emergent concepts. I reviewed the transcripts for key concepts, using the participants' own words. Please see Appendix I: *Code Book for Physician Interviews* for the codebook used for the physician interview analysis.

The cognitive map is an established tool to depict how an individual thinks about a particular process (Miles et al., 2014). Since there is no tool that I am aware of to depict how a *group* of individuals think about a particular process, I used the cognitive map to depict what I heard from the physician interview participants as they described how they used psychosocial information in the course of making clinical decisions.

I constructed the cognitive map by completing two separate steps. First, I divided key concepts into two separate categories: 1) process concepts – *how* decisions are made, and 2) content concepts – *what* information is used to make the decisions (Miles et al., 2014). Process categories included context on clinical decisions, such as *how* clinical targets are established using psychosocial information. Content categories included what factors represented the substance of the topic, such as *what* influenced their consideration of clinical practice guidelines and psychosocial factors. Each of these categories represented content that was present across multiple interviews. Second, I used displays to separate content and process terms, and grouped concepts that seemed to belong together. I did so by examining relationships, if any, that existed between concepts. By analyzing relationships on a large display I was able to create groups of concepts, and links between groups. I used the memos I wrote from my analysis of the interview data to

help identify themes. This formed the basis of the initial cognitive map, which I revised over several iterations to create the final map depicted in chapter five.

3.5.2. Survey Data Analysis

Analyses of the survey data began with data processing and identifying invalid data. I corrected invalid entries for the five physicians who indicated non-physician roles. I clarified their credentials with the marking director, the point of contact in the organization. She located their credentials and training using their internal personnel records. Once confirmed, I corrected their survey entries to “MD” or “DO”. This approach improved the quality of the data, and confirmed that the data contained the information intended in the design (Groves et al., 2011). Also, I confirmed quality using the following: range edits, balance edits, and consistency edits. Range edits confirm that data entered aligns with practical ranges. Balance edits are associated with percentages and outliers. Consistency edits check for uniformity.

Common approaches to handling missing data are listwise deletion and casewise deletion. Listwise deletion is omitting respondent entries that contain missing data. Casewise deletion involves defining a case, stipulating that if any specified data elements are missing, the entire response is deleted. I did not use listwise nor casewise deletion. Given the time required to complete the survey, I expected, and received, incomplete responses. I did not adjust for non-response bias, given that I did not know any characteristics of the respondents, aside from their membership in one of the three organizations represented in the survey sample. I included the responses submitted up to the point that respondents stopped entering responses (Little & Rubin, 2002).

Statistical Analysis

I initially examined survey data using descriptive statistics (Bartholomew, Steele, Galbraith, & Moustaki, 2008). Descriptive statistics describe the size and distributions of various elements in a sample. I evaluated variable distributions using frequencies, means and standard deviations (J. Cohen, 1988; Tavakol & Dennick, 2011).

Tests for Association – Role and Clinical Decisions

I tested for association between practitioner role, based on one of the three groups that comprised the survey sample, and each of the four types of clinical decisions. I used SPSS version 22 to complete a logistic regression to examine the relationships between role and each group of clinical decisions; each group of clinical decisions served as my dependent variable. I used a 95% confidence interval. I selected the logistic regression because I created two category variables from the five category variable responses for the clinical decisions. In the instrument, I asked respondents to indicate the frequency with which psychosocial factors influenced diabetes clinical decisions. I used a five point Likert scale (5-Always, 4-Often, 3-Sometimes, 2-Rarely, 1-Never).

To test for differences between the physicians and other survey respondents for the four groups of clinical decisions, I defined the clinical decision as my dependent variable. I grouped the nurse practitioners and the diabetes educators together since there is overlap in the types of practitioners included in the samples. Since I compared two groups, I used the t-test of difference between means (“independent samples t-test” in SPSS). I excluded from my analysis any response that indicated “N/A – I don’t make or influence these decisions”, an option for the frequency of influence on clinical decisions questions. I considered the Likert scale to be an interval ratio variable, because the difference from “Always” to “Often”, is the same as the “Rarely” to “Never”.

I also investigated perceptions of importance of psychosocial factors by testing differences between each of the four groups of psychosocial factors and years of experience, and physician specialty. In addition, I investigated difference in clinical decisions influenced between each of the four groups of clinical decisions and years of experience, and physician specialty. I used the one-way ANOVA to investigate difference. I formed two groups for years of experience, 1) less than ten years, and 2) greater than or equal to ten years. There were two physician specialties represented in the primary care subsample of survey participants: family medicine and internal medicine. Years of experience and physician specialty served as my independent variables.

Response Rates and Representativeness

Response rate is the total number of surveys returned divided by the total number of surveys sent. Calculating response rates for emailed surveys must also describe the number of individuals who may have received it (Colbert, Diaz-Guzman, Myers, & Arroliga, 2013). I kept close account of the entire sample. I used individual email addresses for the primary care physicians and the nurse practitioners. I did not have access to email addresses for the diabetes educators. Overall response rate was 29.8%, as shown in Table 3.5.2. The response rate for the physicians was 39.8%, 16.0% for nurse practitioners, and 35.8% for diabetes educators.

Table 3.5.2 – Survey Response Rates

	Total	Nurse Practitioners	Diabetes Educators	Primary Care Physicians
Total Sent	769	257	399	113
Total Responses	229	41	143	45
Response Rate	29.78%	15.95%	35.84%	39.82%

3.6. Risk Management

There were several risks associated with this study related to recruiting subjects, credibility and transferability, and content validity. Subject recruitment and participation was critical to the success of the project. To mitigate the risk of inadequate data collection, I communicated the aims of the study and the importance of study participants to potential participants. I leveraged my professional network for interview recruitment, which included the network of my dissertation committee members and colleagues at the Ann Arbor Veterans Administration Center for Clinical Management Research. I also used survey champions in each of the three survey sample groups to help maximize response rates for the online survey.

Qualitative research is subject to threats to credibility and transferability. For this project, creditably threats included omission and observer effects. Omission could occur if I omitted clinical or patient situations relevant to explain how psychosocial factors influence clinical care decisions. Observer effects could occur if participants indicate what they think I want to hear, versus describing what actually takes place (Schensul & LeCompte, 2012). I minimized these risks through my interview probes.

Validity

Although validity has a common definition, there is no consistent method to measure it. Validity refers to the extent to which the survey instrument accurately reflects the intended construct (Chen & Paulraj, 2004; Friedman & Wyatt, 2006; Groves et al., 2011). External validity is dependent upon the survey sampling method. The sample is representative of the larger population (K. Kelley, Clark, Brown, & Sitzia, 2003). Because I am interested in practitioners who make, or have input into, T2DM care decisions, I ensured external validity by using a sample that draws from national and

regional associations, including practitioners from/with various: geographic areas, practice settings, years of experience, and roles. Content validity refers to the extent to which the survey questions reflect specific topics under investigation. Content validity could be threatened if the survey instrument does not fully reflect the categories identified in the interview data. I mitigated this risk by ensuring that the survey instrument was informed by the interview data analysis, and by a lengthy cognitive interviewing process. In addition, I ensured that the survey instrument reflected leading practices found in the literature (see Appendix J: *Principles of Survey Instrument Design*) (D. A. Cook & Beckman, 2006).

Institutional Review Board Approval

The University of Michigan Health Sciences and Behavioral Sciences Institutional Review Board (IRB) approved the study on February 7, 2014 (eResearch ID HUM00085503; OHRP IRB Registration Number: IRB00000246).

CHAPTER 4

ACCESSING PSYCHOSOCIAL INFORMATION FOR CLINICAL DECISIONS

If you look at people who seek a lot of care in American cities for multiple illnesses, it's usually people with a number of overwhelming illnesses and a lot of social problems, like housing instability, unemployment, lack of insurance...

— Paul Farmer

4.1. Introduction

In this chapter, I describe how psychosocial information is accessed in the course of providing diabetes care, specifically in making type 2 diabetes (T2DM) care decisions in the outpatient setting. The study is comprised of two groups of participants: 1) seventeen physicians who participated in one on one interviews, and 2) 219 online survey participants sampled from a group of primary care physicians, nurse practitioners, and diabetes educators. In this chapter, I address two of my six research questions:

RQ1: Which psychosocial factors do practitioners perceive to be important in making, or providing input into, care decisions for adult, type 2 diabetes patients? What is their relative priority?

RQ2: How do practitioners access psychosocial information?

The overall purpose of this investigation is to understand and document what psychosocial factors practitioners consider in making, or providing input into, clinical care decisions. I place psychosocial factors into four groups: 1) sociodemographic, 2) psychological, 3) social relationship and living conditions, and 4) neighborhood and

community. Please see Appendix B: *Psychosocial Factors* for a further description of these four groups of psychosocial factors. I group clinical decisions into four types: 1) establishing appropriate levels of control, specifically for HbA1c (i.e., treatment goals), 2) prescribing medications, 3) making referrals to specialty care and support services, and 4) recommendations for diet, physical activity, and frequency of clinical visits. Please see Appendix C: *Type 2 Diabetes Clinical Decisions* for a further description of these four types of T2DM clinical decisions. Also in this chapter, I introduce my initial conceptual model of psychosocial information access, which depicts 1) the top psychosocial factors indicated by study participants, 2) their sources of psychosocial information, and 3) how this psychosocial information is accessed.

4.2. Characteristics of Study Participants

Interview Participants

A total of seventeen physicians were interviewed, as shown in Table 4.2.1. Approximately half of the interview participants are family medicine physicians; the other half are internal medicine physicians. There is one endocrinologist. There are roughly equal proportions of male and female physicians; half have less than ten years of experience. Approximately one quarter work in one of the following three practice settings: 1) community clinics, 2) the Veterans Administration, and 3) public hospital clinics.

Table 4.2.1 – Interview Participants Characteristics (n=17)

	<i>n</i>
Specialty	
Family Medicine	8 (47.1%)
Internal Medicine	8 (47.1%)
Endocrinology	1 (5.9%)
TOTAL	17
Gender	
Female	8 (47.1%)
Male	9 (52.9%)
TOTAL	17
Years of Experience	
<= 10	9 (52.9%)
11 – 20	6 (35.3%)
21 - 30	1 (5.9%)
>= 31	1 (5.9%)
TOTAL	17
Practice Setting	
Community Clinic	4 (23.5%)
Federally Qualified Health Center (FQHC)	2 (11.8%)
Veterans Administration	5 (29.4%)
Public Hospital Clinic	4 (23.5%)
University Hospital Clinic	2 (11.8%)
TOTAL	17

Online Survey Participants

A total of 219 healthcare practitioners were eligible for and responded to the online survey, as shown in Table 4.2.2. Approximately 20% primary care physicians, and 25% are from one of each of the following roles: 1) nurse practitioners, 2) registered nurses, and 3) registered dietitians. Just over half of participants are certified diabetes educators. Approximately 25% are family practice specialists, and 25% are internal medicine specialists. Just over 15% have endocrinology as a specialty. The vast majority practice in an outpatient clinic or a group practice.

Table 4.2.2 – Professional Characteristics of Survey Respondents (n=219)

	Genesis Primary Care Physicians	North Texas Nurse Practitioners	Michigan Diabetes Educators	TOTAL
Role				
Physician (MD)	39	-	-	39 (17.8%)
Physician (DO)	4	-	-	4 (1.9%)
Physician Assistant (PA)	-	-	2	2 (0.9%)
Pharmacist	-	-	6	6 (2.8%)
Nurse Practitioner (NP)	-	39	12	51 (23.3%)
Registered Nurse (RN)	-	-	58	58 (26.5%)
Registered Dietician (RD)	-	-	58	58 (26.5%)
TOTAL	43	39	136	219
Certified Diabetes Educator				
Yes	1	1	113	115 (53.2%)
No	41	38	22	101(46.8%)
TOTAL	42	39	135	216
Clinical Specialty				
Family Practice	12	20	27	59 (27.4%)
Internal Medicine	30	7	13	50 (23.3%)
Endocrinology	-	3	32	35 (16.3%)
Podiatry	-	1	-	1 (0.5%)
Nephrology	-	-	1	1 (0.5%)
Emergency Medicine	-	3	-	3 (1.4%)
Obstetrics/gynecology	-	-	1	1 (0.5%)
Hospitalist	-	-	3	3 (1.4%)
Other	0	5	57	62 (28.8%)
TOTAL	42	39	134	215
Practice Setting*				
Community Health Center	2	10	23	35
Free Clinic	7	6	14	37
FQHC	1	1	10	12
Outpatient Clinic	20	15	123	158
Veterans Administration	5	1	9	15
Home Health	5	9	18	32
Indian Health Service	-	-	9	9
Group Practice	45	18	44	107
Other	4	6	23	33
TOTAL	89	66	273	428
* select all that apply				

The majority of participants are female; 20% are male, as shown in Table 4.2.3. However the majority of the physicians are male. Just over half are between 45–64 years old. Just over one third have ten years or less of experience, and another third have between 11 and 20 years of experience.

Table 4.2.3 – Demographic Characteristics of Survey Respondents (n=219)

	Genesis Primary Care Physicians	North Texas Nurse Practitioners	Michigan Diabetes Educators	TOTAL
Gender				
Female	8	33	133	174 (80.9%)
Male	34	6	1	41 (19.1%)
TOTAL	42	39	134	215
Age				
25-34	1	6	7	14 (6.5%)
35-44	7	8	17	32 (14.9%)
45-54	19	14	28	61 (28.4%)
55-64	8	10	75	93 (26.2%)
65-74	6	1	7	14 (6.5%)
75-84	1	-	-	1 (0.5%)
TOTAL	42	39	134	215
Years of Experience				
<= 10	9	21	49	79 (38.7%)
11 – 20	15	10	43	68 (33.3%)
21 - 30	10	5	25	40 (19.6%)
>= 31	7	-	10	17 (8.3%)
TOTAL	41	36	127	204

4.3. Overview of Findings

The consideration and consistent influence of psychosocial factors emerged immediately in the investigation, imparted in the initial interviews, and reiterated throughout the subsequent interviews. Participants indicated that psychosocial factors are consistently considered in making T2DM clinical care decisions. Since the physician interview participants consistently emphasized the broad importance of psychosocial

information in general for providing patient-appropriate care, I describe them through analysis of the online survey data, using the average Likert scores for each of the psychosocial factors. In reporting my survey findings, I isolate physician survey responses from the entire survey sample to support the goal of examining potential differences between practitioner groups.

Summary of the Average Likert Scores for Psychosocial Factors

Survey respondents indicated that the top psychosocial factor is *financial strain* from the sociodemographic group, as shown in Table 4.4.2. Respondents indicated 4.84 out of a 5 point Likert scale (5 – Very Important, 4 – Important, 3 – Neither Important nor Unimportant, 2 – Unimportant, 1 – Very Unimportant). Also, 99.4% of responses indicated “Very Important” or “Important”. Next is *mental health status* (4.62/5; 97.6%), and *life stressors* (4.57/5; 97.0%) from the sociodemographic group. *Food security* (4.55/5; 94.8%) from the neighborhood / community group is next. *Social support* is next (4.53/5; 97.5%), followed by *health literacy* (4.53/5; 97.0%), both from the psychological group of psychosocial factors.

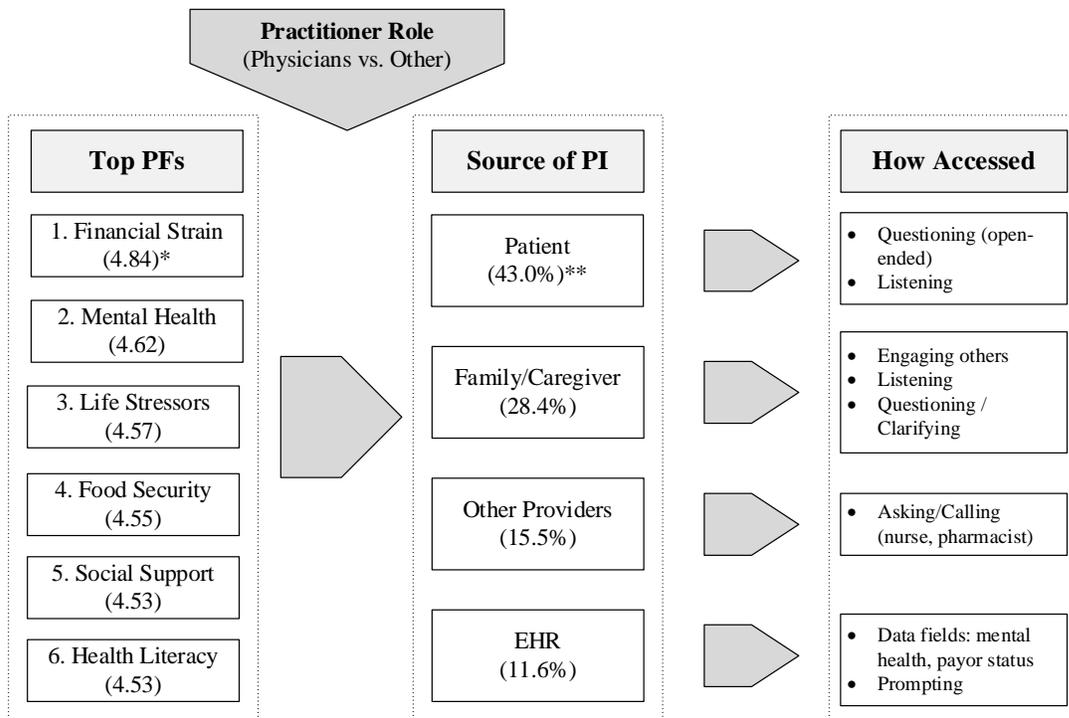
Summary of Sources of Psychosocial Information

Among all respondents, 43.0% indicated that the *patient* is the most frequent source of psychosocial information while among physician respondents, 49.5% indicated as such, as shown in Table 4.5.2 (multiple responses were possible). The *family and/or caregivers* is the next most common source, with 28.4% of all source selections among all respondents, and 39.7% of all sources among physician respondents. *Other providers* is the next most commonly chosen source, representing 15.5% of all source selections among all respondents and 7.3% of all sources among physician respondents. The

electronic health record is the least common specifically-chosen source of psychosocial information, reflecting 11.6% of source choices among all respondents and only 3.2% these choices among physician respondents.

Initial Conceptual Model of Psychosocial Information Access

To summarize the results for RQ1 and RQ2, I created an initial conceptual model to depict the top 25% of psychosocial factors, practitioner role, the sources of psychosocial information, and how the psychosocial information is accessed (see Figure 4.3: Initial Conceptual Model of Psychosocial Information Access). I build upon the model in chapter six, where I show the final, complete conceptual model.



PI – Psychosocial Information

PFs – Psychosocial Factors

* - Mean of responses to Likert scale responses: 5–Very Important, 4–Important, 3–Neither Important nor Unimportant, 2–Unimportant, 1–Very Unimportant

** - % of Total Source Responses. Respondent could indicate more than one source.

Figure 4.3: Initial Conceptual Model of Psychosocial Information Access

I now transition to more detailed results, using this model to structure the presentation of results. I describe my findings from the physician interviews, followed by my findings from the online survey.

4.4. Importance of Psychosocial Factors

RQ1: Which psychosocial factors do practitioners perceive to be important in making, or providing input into, care decisions for adult, type 2 diabetes patients? What is their relative priority?

Both interview and survey participants expressed beliefs that psychosocial factors are important considerations in the course of making clinical decisions for diabetes care, offering extensive and consistent narrative explanations of their perspectives regarding their importance. As many interview participants highlighted, psychosocial factors are vital because the care regimen requires extensive responsibility of the diabetes patient to make *daily decisions* concerning self-care behavior—specifically regarding dietary practices, physical activity, medication behavior, and self-monitoring. The bulk of these decisions are made, and subsequent actions are taken, outside of the clinical environment—away from the support and guidance of the care team. Accordingly, self-care behaviors are greatly influenced by psychosocial factors characteristic of patients’ lives outside of clinical environments. Based on their understandings of this, practitioners attempt to understand patients’ life circumstances to inform care decisions. A family medicine physician with almost 20 years of experience, stated:

Any chronic disease that requires that the majority of the management is done by the patient at home on a daily basis is gonna be completely embedded in these psychosocial situations, and diabetes is the number one ... You have to [consider psychosocial factors all the time]. (P16)

Survey participants also support the key theme that psychosocial factors are considered in making, or providing input into, clinical decisions for diabetes care. For the top six psychosocial factors, they indicated *at least* 4.53 out of a possible five, indicating that they believed these factors were vital considerations.

4.4.1. Physician Interview Findings

The physicians interviewed noted that if diabetes patients have the tools and support to *manage their lives*, then they tend to experience good outcomes; however, if they experience barriers that prevent them from managing their day to day responsibilities, their ability to perform necessary self-care practices could be impaired — thus resulting in worse health outcomes. Therefore, psychosocial factors are central considerations as the physician attempts to assess to what degree a patient is able to manage themselves, their environment, and their treatment. A medical director of a federally qualified health center (FQHC) located in a federal refugee resettlement area in the Northeast United States, offered that diabetes care *must always* consider psychosocial factors because efficacy of care is essentially influenced by to what degree each individual patient is able to navigate the various barriers to self-care they may confront:

About 5 years ago, we tried to figure out why [a] sub-population of patients are consistently with A1Cs greater than 9 ... we looked at demographic information, age, country of origin, male versus female. The only persistent factor that we found out of our population of 700 plus diabetics ... [was that they] have anxiety, depression, schizophrenia, and ultimately people that have a poor control of what's called "managing their lives" ... [they] have obviously a poor control with managing their diabetes. (P01, Family Medicine)

As the above quote suggests, psychosocial information is important because it can offer context and perspectives to physicians concerning the issues their patients may be confronting, which may present barriers to care. For example, P17 states, *"I have a very*

hard time giving a diagnosis of non-compliant, because we're looking at the tip of the iceberg, we don't know what's going on in their life ... you're gonna look at psychosocial factors” (P17, Family Medicine).

Physicians highlight the difficulties that their patients have with managing diabetes because of the demands placed upon them. Participants spoke to the considerable strains of the all-encompassing care regimen. An internal medicine physician (P02) with twenty years of experience practicing in urban areas, states, *“diabetes is probably the most difficult of diseases ... [it requires] management all your life. It affects every facet of your life”*. The patient must undertake relatively strict, daily self-care practices such as specific dietary choices—which can be difficult if a patient is in an insecure or chaotic living situation. The importance of consistency with timing or type of food is therefore one disease-related factor that makes diabetes more difficult to manage, for the patient and for the physician:

If you have significant diabetes where you need to be on insulin ... then you really need to be pretty regiment[ed]. You kind of eat the same amount of carbs every day, and every meal. Otherwise you can't figure out, you can't know how much insulin you should be taking ... It needs to be at the same time every day or things get out of whack pretty quickly. (P16, Family Medicine)

Next, I highlight participants' insights into the importance of specific psychosocial factors shown in the Conceptual Model of Psychosocial Information Access, which physicians addressed in the interviews as important considerations in making clinical decisions concerning their T2DM patients: 1) financial strain, 2) mental health status, 3) life stressors, 4) food security, 5) social support, and 6) health literacy. Then, I explain how each helps physicians understand potential barriers and facilitators to self-care, in order to tailor the treatment they believe most appropriate for the patient.

Financial Strain

There are a myriad of reasons why a patient may not be following their recommended diabetes care regimen, and physicians believe financial barriers are important to consider as a possible explanation. An internal medicine physician (P09) with twenty-five years of experience based in Texas, states how important financial barriers can be; *“How much disposable money do people have is a really big thing, and something I take into consideration ... I don’t care if they speak English or they speak Spanish or Ethiopian or whatever, a more common denominator is just poverty.”*

Physicians explain that patients tend to prioritize their self-care behavior relative to their basic needs, which can be threatened by financial strain. A family medicine physician (P14) with extensive experience with at-risk patients, shared how patients may focus their energies and attention on meeting such basic needs ahead of managing their diabetes: *“lights, water, cable, internet... phone ... all those things ... because if they don’t have that, nothing else matters. They’re just trying to get the lights on, ‘Don’t even talk to me about my diabetes, because I’m trying to get my lights on.’”* An internal medicine physician (P08) with 15 years of practice experience, further stresses, *“if you’ve got limited resources getting the kids to school and getting them the things that they need, [that] takes priority over getting the healthy foods to manage the diabetes.”*

Thus when basic needs are not being met, patients tend to shift their priorities *away from* recommended self-care practices, and *towards* behavior that helps them meet their basic needs. Financial strain can cause such a shift in priorities.

Furthermore, physicians noted that when basic needs are not being met, patients may *believe that* their diabetes management is important, but that this belief may not be

easily transformed into self-care behavior. Again, financial strain can cause a shift in priorities in a way that impedes self-care, as summarized by this physician:

Is it because they literally don't have enough money to pay for their medicine? They might think it's really important, but they've made the decision that, "I need to have food for my child versus getting my Januvia [diabetes tablet medication] which is too expensive. (P01, Family Medicine)

Therefore, as physicians note, financial barriers can cause a patient to miss appointments, not take medications, or make unhealthy dietary choices. P09 shared phenomenon was evident among his/her patients, “[access to money] affect[s] whether or not people can buy the medicines”. Or, as this Texas-based family medicine physician (P10), describes: “they may not ... have the funds ... to buy healthier type foods and so they're eating on the run.”

An internal medicine physician (P08) based in Michigan states how financial strain can present barriers to self-care, which then can result in unplanned hospital admissions; “we recently had somebody with 2 hospital admissions in 1 month, because she's on 15 medications. She has a really big co-pay. She doesn't get paid at the same time her medicines are due. And so she'll go a few days without taking her medicines.”

Physicians with experience treating certain patient populations, based on geographic location or care setting, consider financial strain to be relevant for all of their patients. For example, financial barriers are a consistent consideration for physicians who see under- or uninsured (“self-pay”) patients. Physicians with such patient populations simply assume that financial barriers are always a threat to a patient's ability to perform consistent, healthy self-care behavior. A family medicine physician (P10) with almost a decade of practice experience in a low-income, community clinic, shared, “the financial barrier ... is pretty much universal here at our clinic.”

Mental Health Status

Mental health issues are important because they can indirectly contribute to barriers to healthy self-care; thus, similar to financial strain, mental health issues impede self-care. An internal medicine physician (P07) states, *“The reason ... is not always just socioeconomic. Often it’s mental health issues or something as well, that are preventing them from being compliant.”*

Mental health issues present barriers to self-care by restricting the patients’ motivation and requisite understanding of treatment recommendations. This can result in unhealthy self-care behavior. A family medicine physician (P17) and medical director of a federally qualified health center (FQHC) in the Midwest United States explains, *“if they’re depressed ... they are not able to check their blood sugar. Of course if they don’t check, guess what, they don’t know what it is ... they’re not motivated to do any exercise.”* These barriers can be exacerbated by comorbid conditions, as expressed in this patient case, *“He’s got schizophrenia ... He is cognitively impaired.... He smokes despite his very end-stage COPD (chronic obstructive pulmonary disease) and diabetes”* (P16, Family Medicine).

Some physicians consider mental health status for all patients. The prevalence of mental health issues cause them to be broadly considered:

Every doctor has to think about [mental health] ... 15% of the U.S. population has depression, so everyone should think about depression, really ... And SSRIs [Serotonin-Specific Reuptake Inhibitors, typically used to treat depression] were once the number one prescribed medication in the United States.
(P06, Family Medicine)

Since the diabetes self-care regimen requires considerable responsibility of the patient, mental health issues are consistently noted. An internal medicine physician (P07) with over a decade of experience with at-risk patient populations makes the point this way,

“certainly if people have mental health conditions ... that is clearly going to stand in the way of their ability to care for themselves.”

As with financial barriers, mental health issues tend to be considered when treating certain patient populations, based on geographic areas where physicians practice. Physicians describe, based on their practice experiences, how patients from certain geographic areas tend to have higher concentrations of mental health issues. One family medicine physician with practice experience in different, major United States urban centers states, *“There’s a lot of mental illness in, I think urban kind of violent, or nearly violent environments”* (P06). Another family medicine physician (P16) describes how economic challenges are common among her patients with mental health issues, therefore they tend to gravitate to low-income communities; *“Ypsilanti (Michigan) has a very large population of schizophrenic and bipolar disease patients. It’s a cheap place to live.... so people who don’t have very much money go live there. And people with schizophrenia don’t have very much money.”*

Life Stressors

Life stressors are important considerations because they can have dramatic and negative effects on self-care behavior. Physicians try to assess stress level to get an understanding of what the patient will realistically be able to do. Awareness of life stressors, and association with other psychosocial factors, also help physicians understand potential reasons for unhealthy self-care practices. This understanding regarding drivers of self-care is important in helping them determine the type of support a patient might need.

Stressors are generally associated with other psychosocial factors, which can stem from various everyday circumstances, often concerning difficult relationships with other people such as family members. As this physician noted, he considers “*stressors in terms of do they have unstable relationships with their family members*” (P01, Family Medicine). Another family medicine physician (P06) with experience with at-risk patients provides examples of stressors that impede self-care he has observed with his diabetic patients, “*stressors in their lives ... a family member who's in jail ...*”

One physician also highlighted the problem of gun violence in the broader community as an important source of stress for her diabetic patients. Physicians recognize that stress affects self-care because it may lead to self-soothing and impaired decision-making “*stressors ... causing them to overeat, make poor decisions*” (P14, Family Medicine). Life stressors, again accompanied by other psychosocial factors, also tend to lower a patient’s motivation and confidence: “[*lack of*] *support ... financial resources... general mental health... stressors. Certainly go hand in hand with motivation, self-efficacy ... patient's sense of agency*” (P15, Family Medicine). These experiences of stress can also increase vulnerability to other problems, such as mental illness, as one physician argued: “*stress ... loneliness ... things which aggravate to depression*” (P11, Internal Medicine).

Some practice settings tend to have patients who experience various, persistent life stressors — often associated with poverty. A family medicine physician who sees patients at a community clinic shares, “*In this setting, we have a skewed population here ... in our setting in general uninsured, poor people, you have to always consider that ... they have a very high stress level in their lives and that stress affects them negatively*”

... they ... come in with depressive-type symptoms or stress-related symptoms” (P10, Family Medicine).

Food Security

Lack of consistent access to food is important because it can present barriers to following dietary recommendations. Physicians described two threats to food security: 1) not enough food due to financial strain, and 2) lack of access to healthy foods in neighborhood. Financial strain is a very severe problem with many layers, including food access, as articulated by a family medicine physician (P16):

Homeless patients have a real hard time managing their diabetes, things like ... some consistent kind of food ... you [can't] fully assess the quantity of carbs that you are ingesting, and have a reasonable way of figuring out how much of insulin you should be taking. So for people who need insulin to manage their diabetes, being homeless makes it incredibly difficult.

A family medicine physician (P15) also states that food insecurity is an important issue standing in the way of self-care among some of her patients, “... *the reason why their A1c is high is because they don't have enough food, or if they're buying a lot of calorie-dense, nutrient-poor food.*”

Consideration of this issue appears to be situational. The family medicine physician continues, describing what prompts her consideration of food insecurity, and how other psychosocial factors may also be considered, “*if someone is uninsured or Medicaid, I'm certainly gonna be ... asking a lot more questions about financial security, and food security ... and like, are needs getting met*” (P15).

Social Support

Following the diabetes care regimen requires considerable social support; it can act as a facilitator or barrier for adherence to recommended self-care behaviors.

Understating the level of social support available to the patient helps the physician understand to what degree the patient may have available to help them, “[*understanding level of*] social support [*is*] definitely [*important*].... And ... obviously, how many people live in the family is also important. If you’re by yourself versus you have a family to support” (P11, Internal Medicine). As will be discussed in the next chapter, this assessment of available help is important in assessing both patient capabilities and in evaluating the causes of patient behavior. The importance of social support to diabetes-related self-care was summarized by this physician: “*Diabetes is really difficult to manage all by yourself ... doing the shopping, doing the meal preparation, making trips to the pharmacy ... Oftentimes, it’s a team thing. The spouse or the significant other or oftentimes, the child is the one going to the pharmacy or going to the store*” (P01, Family Medicine).

As suggested above, strong social support can facilitate self-care. An internal medicine physician (P13) with practice experience with at-risk patients in the East and Midwest United States, further illustrates with reference to a specific patient case:

And I know, for example, that he [diabetic patient] has a very supportive wife who will do whatever needs to be done at home. Whatever it is I say that he should do, she will make sure it happens, and I know that’s a key part of his psychosocial environment.

Conversely, physicians also share specifically how *lack* of social support can act as a barrier to recommended self-care behavior. Low social support can impede the patient’s ability to manage the various self-care responsibilities associated with the diabetes care regimen. As exemplified in the following quote, physicians note when a patient’s social relationships may present barriers to self-care, such as friends, neighbors or roommates:

I've got one gentleman ... [he] always seems to have some problematic person renting a room from him ... that is very disruptive to his ability to manage his chronic conditions because this person's always causing trouble, it causes him a lot of stress. They're bringing substances into the house, there's always alcohol around. There's a lot of drama. Those kind of things make it really difficult to manage [diabetes]. (P13, Internal Medicine)

Social support is considered in specific situations. They consider potential barriers to self-care due to low social support when they see patients who may not have family members or friends who can help with self-care demands. An internal medicine physician (P13) describes this when he considers the patient's support network; *"I think people's social support network is really important. So, do they have caregivers, friends, other people in their social network that can support them? Or conversely, that make it hard for them to effectively manage their diabetes?"* Understanding a patient's level of social support is critical to approximating what they can realistically perform.

Health Literacy

Health literacy is an important consideration. Physicians assert that when diabetes patients understand the treatment, they are more prone to follow recommended self-care. Consequently, they experience better outcomes. As this family physician said: *"... some people just don't understand the health problem ... they could have low health literacy ... they [may] not focus on that aspect of their health"* (P06, Family Medicine).

An internal medicine physician (P13) discusses how a patient's level of health literacy and health numeracy might affect their ability to understand the rationale underlying treatment decisions: is important:

Their level of health literacy, their level of health numeracy. Those are things that I think a lot about... it relates to their ability to understand the numerical things about diabetes and ... risk for things in the future and how that may relate to their understanding of sort of time perspective and reducing the risk of things over a five-day or 10-year time horizon.

Limited health literacy can also affect patient motivation. An internal medicine physician (P13) asserts this connection as follows: *“their health literacy or their numeracy ... obviously, there's some sort of correlation... a fairly strong correlation there ... we ... use education as a proxy.... a higher level of education, in many cases [is] correlated with things like self-efficacy, activation, treatment engagement, motivation.”*

Physicians consider health literacy issues when caring for at-risk patients. A family medicine physician (P11) describes her experience with at-risk patients, *“a lot of [our patient] population ... is illiterate. But if you give them health education, they wanna learn and take care of themselves ... health education probably is one most important factor [in these patients doing well].”* An internal medicine physician considers health literacy issues when he sees patients who may have low levels of formal education, which, in his experience, influence how involved they may be in their care, *“people with lower levels of education are more often people who have lower levels of self-efficacy, motivation, and treatment engagement”* (P13, Internal Medicine).

4.4.2. Survey Findings

Since there are no previous published studies nor an established standard procedure to select the top psychosocial factors, I focus on the top 25% (6 of 23) reflected in my sample. To identify the top 25% of psychosocial factors, I list them according to highest average score on the Likert scale for my sample (5 – Very Important, 4 – Important, 3 – Neither Important nor Unimportant, 2 – Unimportant, 1 – Very Unimportant). Please see Appendix K: *Average Likert Scores of Psychosocial Factors* for the complete list of 23 psychosocial factors I investigated, sorted by highest to lowest average score on the Likert scale.

The psychosocial factor, *financial strain*, had the highest average Likert score of all psychosocial factors measured. As shown in Table 4.4.2 – Average Scores of Individual Psychosocial Factors, the six highest average scores for psychosocial factors are, in order of relative priority: 1) financial strain (sociodemographic), 2) mental health status (psychological), 3) life stressors (psychological), 4) food security (neighborhood / community), 5) social support (social relationships / living conditions), and 6) health literacy (psychological). I isolate physician responses in the table. Please see Appendix L *Average Likert Scores of Psychosocial Factors by Group* for a listing of average scores of the psychosocial factors by the four groups: 1) psychological, 2) social relationships / living conditions, 3) neighborhood / community, and 4) sociodemographic.

The differences for all six of the top psychosocial factors indicated are statistically significant based on the comparison of physicians to other practitioners. I completed an independent-samples *t* test comparing the means of the Likert scores of importance (5 – Very Important, 4 – Important, 3 – Neither Important nor Unimportant, 2 – Unimportant, 1 – Very Unimportant) between the two groups: 1) physicians, and 2) the nurse practitioners and diabetes educators.

For *financial strain*, I found a significant difference between the two groups ($t(162) = 2.657, p < .05$). For *mental health status*, I found a significant difference between the two groups ($t(162) = 4.531, p < .05$). For *life stressors*, I found a significant difference between the two groups ($t(162) = 3.978, p < .05$). For *food security*, I found a significant difference between the two groups ($t(157) = 8.354, p < .05$). For *social support*, I found a significant difference between the two groups ($t(157) = 4.029, p < .05$). Last, for *health literacy*, I found a significant difference between the two groups ($t(162) =$

-4.897, $p < .05$). I report the absolute value of the t-value. In all cases, the means for the nurse practitioners and diabetes educators are *higher* than the physicians for each psychosocial factor — suggesting that, on average, these practitioners viewed psychosocial factors as more important than their physician counterparts.

Table 4.4.2 – Average Likert Scores of Individual Psychosocial Factors

	Total ($n = 164$)	Primary Care Physicians ($n = 36$)	Nurse Practitioners & Diabetes Educators ($n = 128$)	p value
Financial Strain	4.84 (.383)	4.69 (.525)	4.88 (.323)	.009
Mental Health Status	4.62 (.556)	4.28 (.701)	4.73 (.465)	.001
Life Stressors	4.57 (.576)	4.25 (.649)	4.66 (.522)	.000
Food Security	4.55 (.633) _a	3.88 (.729) _b	4.74 (.460) _c	.000
Social Support	4.53 (.572) _a	4.20 (.678) _d	4.62 (.504) _e	.000
Health Literacy	4.53 (.580)	4.14 (.683)	4.64 (.498)	.000

Note. Respondents were asked to indicate the importance of psychosocial factors in making, or providing input into, diabetes care clinical decisions. Responses were captured in a Likert scale: 5 – Very Important, 4 – Important, 3 – Neither Important nor Unimportant, 2 – Unimportant, 1 – Very Unimportant. Standard deviations listed in parentheses.

^a $n = 159$. ^b $n = 34$. ^c $n = 125$. ^d $n = 35$. ^e $n = 124$.

4.4.3. Comparison of Results

Both interview and survey participants indicated that psychosocial factors were influencers of clinical care decisions. Five of the top six psychosocial factors, as indicated by average Likert score in the survey, were also discussed extensively by the interview participants: 1) financial stress, 2) social support, 3) mental health status, 4) health literacy, and 5) life stressors. However, neighborhood context was emphasized more by interview participants than survey respondents; while interview participants mentioned this as an important theme in the context of life stressors, it was one of the lower-scored factors in the survey (4.01/5: 76.1%). Additionally, although survey

participants emphasized food insecurity as a psychosocial factor considered (4.55/5: 95.0%), it was not as commonly mentioned by interview participants – although it was mentioned enough to include it as a theme. Differences between practitioner roles will be discussed further in the discussion section.

4.5. Sources of Psychosocial Information

RQ2: How do practitioners access psychosocial information?

Both interview and survey participants indicate that the patient is a significant source of psychosocial information. Interview participants conveyed how the patient, via the patient consultation, is the primary source of psychosocial information. Both sets of participants also shared that the patient’s family and caregivers are vital sources of this information. Please see Table 4.5.1 for a summary of the sources of psychosocial information, and detail on techniques physicians use to access it.

Table 4.5.1 –Sources of Psychosocial Information, How Accessed

Source of Information	How Accessed
<ul style="list-style-type: none"> • Patient 	<ul style="list-style-type: none"> • Questioning (open-ended) • Listening
<ul style="list-style-type: none"> • Family/caregivers 	<ul style="list-style-type: none"> • Engaging others • Listening • Questioning / Clarifying
<ul style="list-style-type: none"> • Other Providers 	<ul style="list-style-type: none"> • Asking / calling them (i.e., nurse, pharmacist - members of care team)
<ul style="list-style-type: none"> • EHR 	<ul style="list-style-type: none"> • Data fields: mental health, payor status • Prompting

Participants also use the electronic health record as a source for psychosocial information, although less commonly per the survey results. Interview findings showed

that the EHR was most helpful for identifying a small number of factors of interest to them: mental health status, medication refill behavior, and attendance at clinical appointments (see Figure 4.3). More detail is provided below.

4.5.1. Physician Interview Findings

Patients

Interview participants indicated that patients are their main source of psychosocial information; it is primarily acquired when physicians ask patients about barriers to following the diabetes care recommendations that they may be experiencing (see **Questioning (open-ended)** on Figure 4.3). As this participant explained, *“I will ask them point blank, how is their mood and how they’re doing ... I usually will just rely on the patient telling me”* (P07, Internal Medicine). Beyond eliciting general issues, some physicians also have direct conversations with their patients about specific psychosocial issues, if they believe they may be experiencing barriers because of them. As this participant explained, *“I very much have conversations about what they’re able to afford in terms of their medications”* (P15, Family Medicine).

In addition to context on barriers, these conversations may also elicit specific patient priorities, a key input in selecting clinical goals appropriate for the particular patient’s circumstances. A family medicine physician (P16) recounts a recent conversation she had with her patient concerning how employment demands interfered with his ability to follow the diabetes regimen. As a result, his priorities shifted:

He said, “Look, my decision is to keep my job. I’d rather keep my job than manage my diabetes. I understand that the long term health consequences are bad, but I’m not gonna treat my diabetes right now. I’m just gonna let it go. And when I get on my feet again and I get a place to live again, then I’ll talk to you about my diabetes management.”

Some patients will also share psychosocial information about barriers they are experiencing, without prompts from the physician, “*So many times they just come tell you, ‘I can’t afford that insulin’*” (P03, Internal Medicine). In these cases, the primary mode of access is **Listening** (see Figure 4.3). Of interest are issues they may be experiencing in that particular moment, or those on a more long-term basis.

Caregivers and Family Members

Caregivers and family members are also sources of psychosocial information for physicians. Participants indicate that **engaging others**, especially the patient’s support network is important (see Figure 4.3) since it can be a key information source regarding psychosocial issues facing a patient. As this physician explained: “*[for some patients] ... we have to engage the family. It’s really important to get some family member [to attend clinic visit with the patient], or at least some decision makers in the family who play an important role ... that really helps*” (P11, Internal Medicine).

Caregivers provide psychosocial information directly regarding factors about which they have knowledge, like access to support; “*[the] caregiver might tell you [about] their home situation*” (P03, Internal Medicine). They also can provide insight on specific cognitive issues, which can be difficult for the physician to access from the patient themselves; “*So if they’re having problems remembering, they’re having memory issues that the family tells us, ‘Oh, we’re noticing some things at home.’ You’ll get that information from their family member caregiver. We have to rely on that*” (P07, Internal Medicine). This information may be accessed by physicians either by **listening** or by **questioning/clarifying** (see Figure 4.3).

Other Practitioners

Physicians rely on other members of the care team to help identify potential psychosocial barriers, and help address them – primarily by **asking/calling** these practitioners (see Figure 4.3). For example, physicians acknowledge that nurses can be an excellent source of information on psychosocial barriers, and one described how he asks them directly about his patients’ potential barriers, *“nurses are totally onto this [psychosocial barriers]. They're the ones who can answer a lot more [questions about psychosocial barriers] than the providers”* (P02, Internal Medicine). A family medicine physician (P12) also shares how he calls the pharmacist when he might have concerns about psychosocial barriers to medication behavior. He consults with this member of the care team to confirm the barrier and develop approaches to address it, *“[When] I have concerns about adherence ... which we would frequently do. We would call our pharmacy andget [the] history ... they're supposed to get refills every month. Well she's had three refills in the last six months. Well that explains it...”*

Electronic Health Record

Although they are the most frequently relied upon information sources, patients and caregivers may not fully articulate the psychosocial issues they are facing. Accordingly, physicians may use the electronic health record (EHR) to help **prompt** a conversation about psychosocial barriers (see Figure 4.3). Additionally, physicians **review** the data fields to help understand medications refill behavior, attendance at follow-up appointments, and explore other potential barriers (see Figure 4.3). In these cases, they will use the EHR to help identify a specific psychosocial barrier, such as mental health status.

EHR – Prompt for Further Probing

An internal medicine physician (P07) states how he uses the EHR to check specifically for medication behavior, *“if they’re not refilling ... you’ll know ... there’s an issue with meds. You’ll talk to them about it.”* P07 also explains how insight regarding medication refill history found in the EHR can trigger dialog probing for potential psychosocial barriers; *“you ... look at their medication history ... [to confirm] if they’re not refilling ... You’ll know ... there’s an issue with meds. You’ll talk to them about it and depending on what they say ... [confirm if] they’re agreeable to seeing someone to help them out... They might say, ‘I can’t afford it.’ Or they might say, ‘I forget,’ or ‘I don’t need it,’ or ‘I don’t think I need it, I feel fine.’”*

P07 also shares how information in the EHR helps her understand if the patient is missing follow-up appointments, and this information helps guide the conversation with the patient which could reveal psychosocial barriers, *“information [in the record] ... could [prompt me to probe], ‘Why can’t [you] make it to the appointment? Why did you miss your last three appointments?’”*

EHR – Reviewing Data Fields

The EHR is also used to help identify a problem. It can provide insights on psychosocial factors that patients may not share directly. For example, they use the EHR to help them assess mental health status; *“generally people wouldn’t tell me about suicidal ideation, but sometimes it would be noted [in the EHR] that they had a suicide attempt”* (P06, Family Medicine).

Payor status, contained in the clinical record, can also help guide the conversation on potential self-care barriers due to financial strain, *“if someone is uninsured or [has,] Medicaid, I’m certainly gonna be, right away asking a lot more questions about financial*

security, and food security, and housing status, and just kind of checking in and seeing like, safety ... I mean, just in terms of like housing security [if] needs [are] getting met” (P15, Family Medicine).

4.5.2. Survey Findings

In line with the interview findings, survey respondents indicate that the *patient* is the most frequent source of psychosocial information—representing 43% of all source selections among all respondents, and 50% among physician survey respondents, as shown in Table 4.5.2. The table shows the absolute number of all sources indicated, for each of the 23 psychosocial factors investigated. Respondents could indicate more than one source for each psychosocial factor. The table also shows the percentage of all selections for each source given as an option. The family and/or caregiver(s) is the second most indicated source (28.4%), followed by other providers or members of the care team (15.5%). The electronic health record is the least indicated specific source (11.6%). The importance of these factors are also represented in Figure 4.3.

Table 4.5.2 – Selected Sources of Psychosocial Information

	Total Selections (<i>n</i> = 164 respondents)	Primary Care Physician Selections (<i>n</i> = 36 respondents)	Nurse Practitioners & Diabetes Educators (<i>n</i> = 128 respondents)
Patient	1925 (43.0%)	340 (49.5%)	1585 (41.8%)
Family / Caregivers	1270 (28.4%)	273 (39.7%)	997 (26.3%)
Other Providers / Members of Care Team	696 (15.5%)	50 (7.3%)	646 (17.0%)
EHR	521 (11.6%)	22 (3.2%)	499 (13.2%)
Other	37 (0.8%)	0 (0.0%)	37 (1.0%)
No Reliable Source	28 (0.6%)	2 (0.3%)	26 (0.7%)
TOTAL	4477	687	3790

Note. Respondents could indicate that they relied on more than one source (“check all that apply”). Totals represent the total number of times the source was indicated, for each of the 23 PFs investigated.

4.6. Practitioner Characteristics – Physician Interview Findings

RQ5: What practitioner characteristics (i.e. role, age) are associated with their use of psychosocial information?

In this section, I address the fifth research question. I describe practitioner characteristics that are associated with psychosocial information use. Diversity in amount of experience and representation of three specialties in the physician interview sample offers varied perspectives on the relative importance of psychosocial factors. Experienced physicians tend to emphasize the *necessity* to consider the influence of psychosocial factors; this is a fundamental part of how they deliver care. Less experienced physicians understand their importance and agree on their relative priority. Family medicine physicians express that those that chose the specialty may be more inclined to consider psychosocial factors.

Experience

Experienced physicians detail how their insights on the importance and influence of psychosocial factors have developed in the course of providing patient care over several years, which include innumerable patient cases. A family medicine physician (P01) emphasizes that appreciation for the influence of psychosocial factors is *essential* to sustaining a practice in certain care settings; “*as a family practice doc working in a community health center for a decade and a half, either you acknowledge the impact of the psychosocial problems or you’re not gonna last.*”

Physicians’ experience in providing care for diabetic patients informs the importance they place on evaluating psychosocial information, which may have been

provided by other members of the care team. An internal medicine physician (P09) with over two decades of experience states, *“I think the difference between being a young doctor and an old doctor, is that the young doctor will just take the history that somebody else has gathered as gospel. An older doctor will look at it and go, ‘I wonder if all of that’s true?’ Because they’ve seen enough patients to realize that it is not true.”*

Family Medicine Specialty

A family medicine physician asserts that the *specialty itself* may predispose physicians to be sensitive to the importance of psychosocial factors:

I would hope that [residents have] a little bit of bias as a family practice resident that they care about the big picture and not just the individual disease. Because there’s inter-relationships between ... co-morbid problems ... and ... their psychosocial issues. I mean it’s kind of ... I don’t know, how does a plumber learn to be a plumber? I mean he watches a good plumber after a while, and then he goes out on his own, and goes back to that good plumber every now and then. They’re observing how I’m interacting with patients and trying to glean from it some sort of knowledge that they can bring to their own practice ... we take care of a lot of diabetics ... this is the way we do it. Here is our data to say whether or not it’s been successful or not. (P01, Family Medicine)

In some cases, appreciation for the importance of psychosocial factors may have started prior to medical training, depending on an individual’s experiences before attending medical school. Those who believe these issues are important may have formed these perspectives prior to beginning formal medical training. As this family medicine physician (P15) shares, *“I had [perspectives on psychosocial factors] going in just kind of through personal experience.... I definitely kind of didn’t have a traditional path in medical school ... I’ve had a lot of other experiences and done international work and did a lot of other things ... done community organizing ... [so] in medical school, for sure, I was very much aware of it and very much aware of the way in which it was impacting my patients”* (P15, Family Medicine).

4.6.1. Survey Results

Likert Scores for Psychosocial Factors and Clinical Role

As table 4.4.2 shows, there is a statistically significant difference between average Likert scores for psychosocial factors between physicians on the one hand, and the nurse practitioners, registered nurses, and diabetes educators on the other. The nurse practitioners, registered nurses, and diabetes educators scored each of the psychosocial factors *higher than their physician counterparts*.

Likert Scores for Psychosocial Factors and Years of Experience

Based on interview participant perspectives, I further investigated perceptions of psychosocial factors by testing differences between each of the four groups of factors and years of experience. Years of experience is my independent variable and each of the four groups of psychosocial factors is my dependent variable. I measured the independent variable based on if the respondent had less than ten years of experience, or greater than or equal to ten years of experience. I used the one-way ANOVA to investigate difference. I found no statistically significant difference between years of experience and average Likert scores for psychosocial factors for any of the four groups of psychosocial factors (Psychological: $F(1,162) = 0.12, p > .05$; Social Relationships / Living Conditions: $F(1,157) = .005, p > .05$; Neighborhood / Community: $F(1,157) = 1.985, p > .05$; Sociodemographic: $F(1,162) = .020, p > .05$). In fact, I found remarkable similarities in average Likert scores between the less experienced and more experienced practitioners.

Likert Scores for Psychosocial Factors and Physician Specialty (Internal Medicine and Family Medicine)

Also based on the interview results, I investigated whether there are differences between average Likert scores for each of the four groups of psychosocial factors and

physician specialty. Specialty (Family vs. Internal medicine specialty) is my independent variable and each of the four groups of psychosocial factors is my dependent variable. The primary care physicians were comprised of two specialties: family medicine and internal medicine. I used the one-way ANOVA to investigate differences only in the physician sample (n=36). I found no statistically significant difference between specialty and average Likert scores for psychosocial factors for any of the four groups (Psychological: $F(1,34) = 2.19, p > .05$; Social Relationships / Living Conditions: $F(1,33) = 1.42, p > .05$; Neighborhood / Community: $F(1,32) = .005, p > .05$; Sociodemographic: $F(1,34) = 5.17, p > .05$).

These findings are reflected in the initial conceptual model of psychosocial information access (see Figure 4.3) where practitioner role is depicted as a moderator of perceived influence of information sources.

4.7. Conclusion

In this chapter, I described the psychosocial factors that practitioners perceive to be important in the course of making type 2 diabetes care clinical decisions in the outpatient setting, which answers RQ1. As depicted in the initial conceptual model of psychosocial information access (see Figure 4.3), the top six psychosocial factors are: 1) financial strain, 2) mental health, 3) life stressors, 4) food security, 5) social support, and 6) health literacy.

I detailed how psychosocial information is accessed from four main sources: 1) patient, 2) family / caregivers, 3) other providers, and 4) EHR. Practitioners indicated that the patient is the most frequent source of psychosocial information, specifically via the patient consultation. The patient's family and caregiver(s) is also a source of

psychosocial information. These individuals offer critical insights on self-care activities, such as medication behavior. The EHR is also a source, although less often.

I found a statistically significant difference in perspective on the importance of psychosocial factors based on role. As a group, the non-physician roles (i.e., nurse practitioner, registered nurse, diabetes educator) perceived psychosocial factors as *more important* than their physician counterparts (see table 4.4.2). I found little difference in perceived importance of psychosocial factors based on years of experience. I found no statistically significant difference in perception of importance of psychosocial factors based on physician specialty. Practitioner role is depicted on the initial conceptual model depicted in Figure 4.3.

In the next chapter, I describe how psychosocial information is used to make diabetes clinical decisions. I introduce a cognitive map depicting how practitioners make clinical decisions and detail the specific clinical decisions for which psychosocial information is used.

CHAPTER 5

USING PSYCHOSOCIAL INFORMATION FOR CLINICAL DECISIONS

It is much more important to know what sort of a patient has a disease than what sort of a disease a patient has.

— William Osler (1849 – 1919)

5.1. Introduction

In this chapter, I describe how psychosocial information is used in the course of making type 2 diabetes (T2DM) clinical care decisions in the outpatient setting. I group clinical decisions into four types: 1) establishing appropriate levels of control, specifically for HbA1c (i.e., treatment goals), 2) prescribing medications, 3) making referrals to specialty care and support services, and 4) recommendations for diet, physical activity, and frequency of clinical visits. Please see Appendix C: *Type 2 Diabetes Clinical Decisions* for a further description of these four types of T2DM clinical decisions.

As described in Chapter four, both interview and survey participants indicate that they consider specific psychosocial factors to be important in the context of diabetes care, and that they use questioning, listening, asking and reviewing approaches to retrieving information from their primary sources of psychosocial information: patients, family/caregivers, other providers, and the EHR. To illustrate how practitioners use psychosocial information, I introduce a cognitive map that summarizes their thought

processes when using this information. I also describe *when* and *how* psychosocial factors influence clinical care decisions. I conclude this chapter with survey findings detailing the influence of psychosocial factors on specific clinical decisions.

In this chapter, I address two of my six research questions:

RQ3: How do practitioners use psychosocial information? How does this information influence their specific care decisions?

RQ4: In which situations are psychosocial factors considered?

Summary of Findings

Interview Themes

Physicians use psychosocial information to help them determine barriers to self-care that patients may be experiencing. They use this information to inform clinical decisions to address these barriers as appropriate for the patient's circumstances.

Summary of Decisions Influenced by Psychosocial Information

Psychosocial information is used most frequently for *target level of control decisions*, as shown in Table 5.5.5.1. Respondents indicated 4.26 out of a 5 point Likert scale (5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never) in response to target level of control decisions. Also, 81.9% of responses indicated “Always” or “Often.”

Making recommendations are next (4.18/5; 90.6%), followed by *other decisions*, (4.14; 80.8%), *making referrals* (4.13/5; 75.8%), and *medications decisions* (4.09/5; 88.6%).

The nurse practitioners, registered nurses, and diabetes educators indicated their decisions were more frequently influenced by psychosocial factors than did the physicians. The difference was statistically significant for medications decisions.

5.2. Cognitive Map of Psychosocial Information Use

Cognitive maps provide a cognitive representation of concepts associated with a particular area, showing the connections between them (Miles et al., 2014). I use the cognitive map to answer my third research question.

RQ3: How do practitioners use psychosocial information? How does this information influence their specific care decisions?

I used this schema to depict how psychosocial information is used to make diabetes care clinical decisions (see Figure 5.2). This visual representation helps articulate “what is going through” physicians’ minds when they reflected upon their experiences using psychosocial information to make diabetes care clinical decisions. I use descriptive labels, drawn verbatim from the physicians’ interviews. In the cognitive map of psychosocial information use, I use quotations and bold font to make physicians’ words conspicuous. For further detail on how I constructed the cognitive map, please refer to chapter three, section 3.5.1.

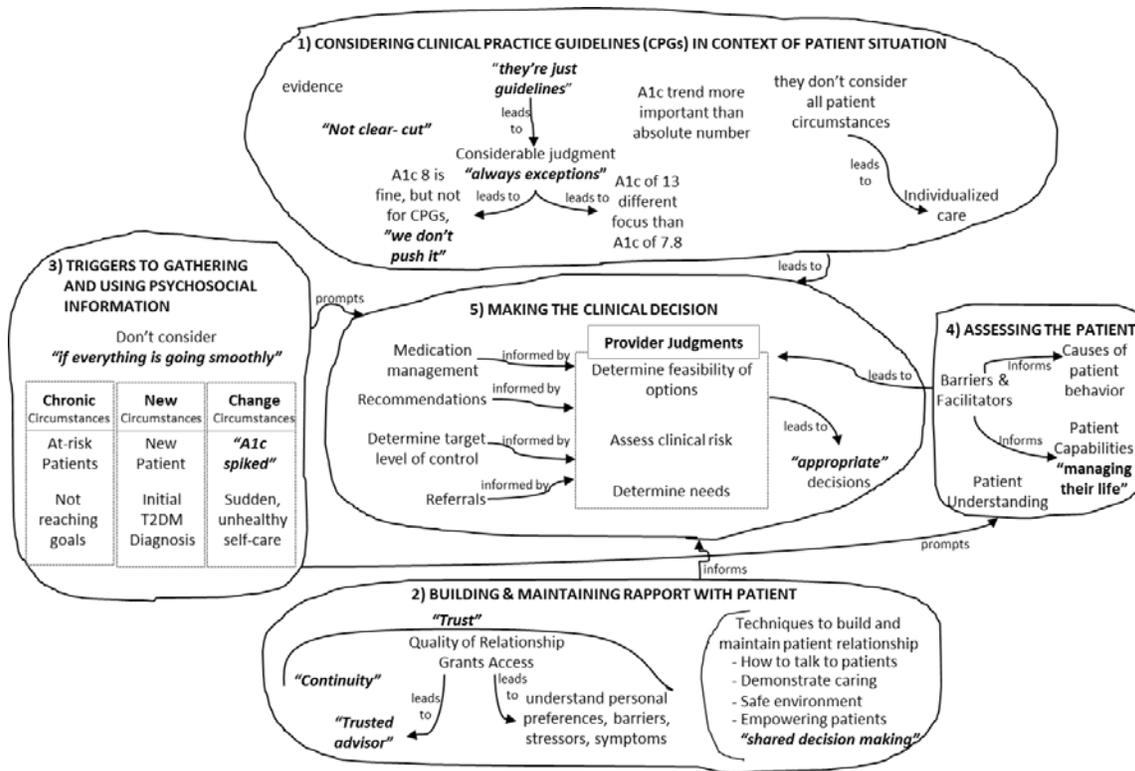


Figure 5.2: Cognitive Map of Psychosocial Information Use

I now detail each of the five areas of the map, which represent the key concepts that comprise the cognitive process of psychosocial information use: 1) considering clinical practice guidelines (CPGs) in the context of the patient situation, 2) building and maintaining rapport with patient, 3) triggers to gathering and using psychosocial information, 4) assessing the patient, and 5) making the clinical decision.

5.3. Considering Clinical Practice Guidelines (CPGs) in Context of Patient Situation

Physicians are aware of general clinical practice guidelines and consider them in the course of clinical decision making, particularly for determining the appropriate target for a patient's HbA1c level. But they emphasize that they calibrate their use of guidelines against several factors, including psychosocial ones. While they certainly consider the

guidelines, they assert that they are by no means a replacement for their own clinical judgment for what they believe is best for the patient. Determining what decision is “best” can be nuanced and imprecise, however. One internal medicine physician (P02) attempts to quantify the ambiguity rooted in the various clinical decisions associated with outpatient clinical care; “... *I tell all the [internal medicine] residents ... ‘if you’re that type of person who wants 100% clarity, you better go into surgery. Because in the medical field, 70% is a good day. 70% certainty is a good day.’*”

Evidence

Physician participants stated that they consistently use the guidelines as a starting point, as they are considered as general standards of care, and represent the best evidence for appropriate targets. A family medicine physician (P01) with administrative responsibilities for clinical performance metrics at a federally qualified health center (FQHC) says, “*I’m a big evidence-based medicine guy, so if there is good data behind a clinical practice guideline, then either myself as an individual [and] as the Chief Medical Officer of the clinic, I’ve tried to get my other docs to endorse those. So, I would say we’re very heavily invested in evidence-based medicine.*” Moreover, there are diabetes guidelines considered beyond the HbA1c target recommendation—like target cholesterol level, blood pressure, diet, physical activity, and an annual eye exam. These supplemental guidelines appear to be considered holistically at each visit. A family medicine physician (P10) described her consistent use of certain guidelines; “*I feel like I always operate considering guidelines because ... there are certain standards that are just standard medical practice ... their LDL goal, are they taking Aspirin? Is their blood pressure well controlled? I mean those are all clinical guidelines we look at that every single time we*

see a patient. Have they received their Pneumovax vaccine? Have they received their flu shot? Are they up to date on their other preventive measures?"

Not clear-cut

Nevertheless, physicians expressed considerable ambivalence concerning the guidelines. Although their clinical decisions are motivated by the evidence, their general attitude is quite mixed regarding their use. This is especially so for diabetes guidelines when compared to other chronic conditions. As one internal medicine resident (P04) explains, *"diabetes guidelines ... they're not really as clear-cut as [guidelines for] hypertension ... If ... blood pressure is above a certain threshold, you need to do something...."*

"They're just guidelines": HbA1c Target

According to interview participants, establishing an appropriate HbA1c target is the specific diabetes care clinical practice guideline that tends to most frequently necessitate clinical judgment, influenced by psychosocial factors. As such, there are *"always exceptions"* (P03). An internal medicine resident (P04) explains, *"... we're always on the fence on changing things ... we don't push it that much.... Because there's a huge range of 7 and 8 ... still there is no real [specific goal] ... it's more like there's clinical judgment rather than [a strict number] ... it's not by numbers."* An internal medicine physician (P03) explains how the guidelines are not directives; they are simply aids to support his clinical decisions, *"they're just guidelines."* This sentiment is echoed by an endocrinology fellow (P05), who contends that judgment is needed when considering the guidelines for target HbA1c; *"I think in the guidelines, there's room for clinical judgment, like a different A1c for people with hypoglycemia."* This requirement

for judgment in setting appropriate HbA1c goals is also expressed by more experienced physicians. An internal medicine physician (P09) with over twenty years of experience states, “*I think there’s evidence to show that ... moving someone below 9, does a better job than leaving them above 9, even though you would not have achieved a goal of below 7.*”

A1c trend more important than an absolute number

For most physician participants, understanding a patient’s HbA1c over a period of time is more important than the absolute number. Physicians stress the value of understanding the patient’s HbA1c history in order to ascertain a trend. Knowing if the HbA1c is decreasing, increasing, or remaining the same, is important; “*Typically [if] they’re trending down ... like if the A1c has been 9, now it’s 8.5, or like 10 and now it’s 9, even if it’s not controlled. I mean we don’t do anything from there because it’s going down.... if ... the trend is in the right direction ... Then we’re fine with that, [I tell the patient] ‘Keep doing what you’re doing’*” (P04, Internal Medicine). However, even with historical HbA1c data, the guidelines are unclear. A family medicine physician (P16) described just how imprecise the decision to establish an appropriate HbA1c goal even with trend data in hand can be:

It’s like “Okay, should I add insulin now or not?” ... their A1c is ranging from say 8.6 to 9.5, not great control ... by anybody’s ideas. The biggest decision is, do I start insulin or not ... and it’s not clear-cut. It’s not like this patient’s A1c is 8.4 today, it was 8.4 last month, it was 8.4 the month before, it was 8.4 the month before that. I’d like it to be under 8 so I’m gonna add insulin this much and it’s gonna go to 7.9 and we’re gonna be done. People don’t work that way.... Their A1c goes all over the place and you’re sort of like looking for where’s the mean here and how much can I push down the top without going too low on the bottom. It’s complicated.

They Don't Consider All Patient Circumstances

Diabetes care decisions are based on various, dynamic factors — including psychosocial factors — which physicians believe are not necessarily fully incorporated into the guidelines. Their use of the guidelines hinges upon what information physicians gather regarding the patient's particular situation, primarily at the time of the visit.

Patient situations can be deeply rooted in psychosocial factors; *“when you read through all these guidelines, [they] probably cover most of the population. They try to cover majority of it ... it might be little bit difficult to apply all the guidelines, [depending upon] patient population ... their education level ... [because] things are different [for certain patients]”* (P11, Internal Medicine). Physicians' level of adherence to the guidelines is therefore dependent upon the patient's situation, derived from their understanding of how a patient's psychosocial factors may impact what they believe is an appropriate for them. The most important factors are detailed below.

5.4. Build & Maintain Rapport with Patient

As described in chapter four (section 4.5), the patient is the most frequent source of psychosocial information for physicians; moreover, as was depicted in the initial conceptual model of psychosocial information access (see Figure 4.3), this information is gleaned almost exclusively as a result of the communication (open-ended questioning and listening) that takes place in the patient-doctor relationship. Using this information is dependent upon the physician's ability to access it, which physicians express is heavily dependent upon the level of trust in patient-doctor relationship. Trust enables the physician to facilitate communication and commitment from the patient on various diabetes care recommendations; *“with any type of patient, you have to build a rapport and you have to build that communication, and so that they buy in to what you're*

teaching them or what you're recommending them, and that's just basic patient-doctor rapport and relationship" (P10, Family Medicine). Consequently, as depicted in Figure 5.2, physicians actively consider how to foster the necessary rapport and relationship.

Trust

Physicians spoke extensively about the importance of building trust with their patients, as this is what facilitates their access to, and subsequent use of, psychosocial information. Patients may share quite intimate and sensitive psychosocial information about their living situation and self-care capabilities. A family medicine physician (P15) believes trust is integral to building the relationships with patients, *"I think trust plays into things a lot ... If we have an established relationship, so they ... know ... that I care about them."* Another family medicine physician (P14) explains how developing trust is essential to how she practices medicine:

The way that I practice medicine ... I know that I'm doing a lot more than just collecting information. I'm developing a relationship with them, I'm developing trust. I'm trusting them and they're trusting me ... it's like everything comes together in the right way for this relationship to work, and then all of a sudden it's like they understand that I actually really care about them. Because I actually care and I want them to be better.

However, this information is rarely disclosed during initial visits, before the relationship is established. An internal medicine physician (P09) with over a decade of clinical experience describes establishing a trusting relationship this way, *"It's kind of weird ... unlocking of someone's trust ... you have to have trust in order to get to the truth about someone's psychosocial factors."*

Although physicians state that they attempt to start building trust at the very first visit, they also recognize that the relationship must be built *before* they expect transparency in disclosure of psychosocial information. The relationship develops over

several visits; *“In that first visit, I think you have to be somewhat skeptical, because people will usually try to paint a better picture ... because they’re trying to somehow please you, or put on a good face. There’s some pride issues; they’re not sure if they can trust you. But I think over time, if you’ve got a good doctor-patient relationship, wow, you may know things that only their priest or religious advisor knows. I mean, it can get to that level”* (P08, Internal Medicine). She cites a patient case in which the patient-doctor relationship facilitated sensitive psychosocial information; *“There are people who, for reasons of pride, will really hide [financial barriers] ... 20% of the time they’ll hide it... it may come out down the road. But only if I’ve established that relationship”* (P08).

Quality of the Relationship Grants Access

The quality of the relationship gives the physician access to sensitive, pertinent psychosocial information. P08 also describes a case when the *quality* of the relationship granted access to pertinent psychosocial information; *“since I had a relationship [with the patient] she knew that she could say that [she will not change certain dietary habits] to me.”* Another internal medicine physician (P09) describes how the quality of the relationship can *grant him access* to the patient’s situation, important in understanding level of social support; *“... from [the] relationship comes all sorts of wonderful things, including access to their social world.... Because they’ll start to be real with you after a while. They may not tell you everything, but ... I don’t tell my wife everything, either. You know what I’m saying?”* A family medicine physician (P16) with almost twenty years of experience describes her mindset during her consultation with a new patient, and her awareness that patients may not initially reveal pertinent, and very sensitive, psychosocial information:

[Seeing a] patient for the first time, you have no idea. And, sometimes patients lie and say, "Everything's fine," even when they're getting the crap beat out of them every night.... Or they're doing a lot of drugs or they're homeless.... They'll lie because they're embarrassed. But, usually, after a couple of visits, you can build some relationship and trust and you'll start to get more information. So, there's some continuity of care that leads to more disclosure.

Continuity

Physicians express the view that seeing the same patient enables them to “get to know” them, and to some degree enables patients to “get to know” them. This continuity is important to accessing psychosocial information; “*over time, you get to know the person. And it's a chronic disease, so yeah ... sometimes when you do see them every month, there's more things you find out and you can take it to account*” (P05, Endocrinology). Seeing the same patient over time helps facilitate disclosure which occurs as the relationship develops, and trust is established:

I think trust plays into things a lot.... If we have an established relationship, so they also know me and they know that I'm not gonna force anything on them ... that I care about them It's gonna be a shared decision making versus someone who doesn't know me at all ... if I do know them, [if] I do know their family, and we kinda have gone through ups and downs together.
(P15, Family Medicine).

Trusted advisor

Seeing patients over a period of time enables the physician get to know the patient in depth. This helps the physician recognize if psychosocial factors may facilitate, or present barriers to, following the recommended care regimen; “*part of it is the longitudinal rapport that I build up with patients. I mean if they've been my patient for years, hopefully I am that trusted advisor that is giving them some salient information*” (P01, Family Medicine).

5.4.1. Techniques to Build and Maintain the Patient Relationship

Physicians describe various techniques they use to help build and nurture trusting relationships with their patients; accordingly, this is included in the cognitive map of psychosocial information use (see Figure 5.2). This is an important part of how they provide patient care. Building trusting relationships is at the core of how they practice.

“How” to Talk to Patients

Techniques to build trust include *how* physicians talk with patients. They ask general and specific questions that elicit the patient’s input on barriers to care that they may be experiencing. They may direct the conversation toward specific barriers (i.e., financial strain) or guide the consultation toward how their patients’ living situations might impact their self-care behavior, and subsequently their HbA1c; *“I am ... able to bring the attention and the focus ... on [what is impacting them]. Some of the times ... they’ll volunteer, ‘Listen, my control’s horrible because right now I’m feeling horrible because of my grandson.’ ... Hopefully I’ll lead them in that direction”* (P01, Family Medicine).

Demonstrate Caring

Successfully demonstrating caring for their patients is central to how physicians deliver care. An internal medicine physician (P09) describes how caring is really the essence of what he does with his patients, *“I really don’t ‘cure’ very many people. I just kind of care about them. And that caring translates to a relationship.”* Demonstrating that they care for their patients helps them forge connections, which facilitates sharing of pertinent, often sensitive, psychosocial information; *“[they disclose because of the]*

doctor-patient relationship, the ability to make a connection ... The fact that I care about them and that I demonstrate that in my behaviors” (P08, Internal Medicine).

Safe Environment

Physicians express that establishing and maintaining a safe environment – as defined by freedom from judgment, affirming language, and protection of privacy — is important. A safe environment is imperative to establish from the very first encounter with the patient; *“I think the key is, if you’re judgmental or blaming in the initial visits, and you say, ‘What? You aren’t taking care of yourself.’ Or, ‘I can’t help you if you don’t take care of yourself,’ then, you get nothing. But, if you’re supportive and say, ‘Wow, it sounds like you’re working really hard to manage this,’ or, ‘You’ve done a good job of dealing with this problem,’ then you get more information” (P16, Family Medicine).*

Furthermore, maintaining this protected space facilitates access to information; *“I’ll ask one question and then this whole other floodgate opens ... if you allow that possibility and allow people to feel safe, which I think is really what it is” (P15, Family Medicine).*

However, physicians must maintain appropriate boundaries if they have close relationships with patients *and* their patient’s family members, whom they may also be treating. This is a consideration in maintaining, and communicating, a safe environment, free from disclosure of personal information. Once patients realize that their confidentiality is maintained, they may share additional information:

There are two issues. If ... the doctor knows your family ... and your friends ... very well... sometimes that kind of becomes like, “Oh, hopefully that doesn’t get disclosed.” Usually it doesn’t, but that confidence I should have in you that, “Okay, my information is going to remain personal.” [the patient may] start disclosing ... As a patient, if I’m improving in my health, and I’m seeing that my doctor is really doing the best to work on my health, and I haven’t seen anything getting disclosed anywhere, I’ll start disclosing accordingly.
(P11, Internal Medicine)

Empowering Patients

Physicians also attempt to develop and nurture the patient relationship by acknowledging the autonomy and dominion that patients have over virtually every self-care decision, even the decision to select their doctor. This means that some physicians refuse to be directive with their patients. As this physician says, *“I will not necessarily tell a person what to do. Some people want that, then I’m not a good doctor for them. I’ll just tell them straight to their face, ‘I’m just not gonna be a good doctor for you. There’s lots of other doctors’”* (P14, Family Medicine).

Empowering interactions are also characterized by decisions that are shared. An endocrinologist (P05) describes how she empowers patients by allowing them to voice opinions about potential treatment options, *“[I give them] some time to talk ... [I] ask them, ‘What do you think?’ or ‘Can you do this?’ Instead of saying, ‘Do this. Do this. Do this.’ I think that’s the main thing.”* Similarly, this family medicine physician (P15) empowers patients through shared decision making, *“they know that I’m not gonna force anything on them... I’m gonna make recommendations, but it’s gonna be shared decision making.”*

5.5. Triggers to Gathering and Using Psychosocial Information

In this section, I answer my fourth research question. I describe the situations that trigger consideration of psychosocial factors.

RQ4: In which situations are psychosocial factors considered?

Although practitioners consistently indicate that psychosocial factors are generally important influencers of diabetes clinical care decisions, there are specific circumstances when psychosocial factors are particularly relevant, and situations when

they are less so. In this section, I outline the situations in which physicians may not consider psychosocial factors, followed by the situations when they do.

Do not Consider Psychosocial Factors if Patient is Responding to Treatment

Physicians may not consider psychosocial factors if the patient is doing well clinically; *“If a patient is already well-controlled, typically whenever we see him and his A1c is good every time. We really don’t think much beyond that”* (P04, Internal Medicine). Another internal medicine physician (P13) states, *“I think that for better or for worse, I often don’t consider ... [psychosocial factors] ... as much in my treatment decisions ... if everything is going smoothly.”*

If the patient appears to be following the care regimen — and their clinical numbers bear this out — the physician may conclude that, if indeed the patient is experiencing barriers to care, they must be addressing them sufficiently; *“You don’t actually have to ... [think about psychosocial factors] in the healthy guys that have it together and have financial resources. They’ve figured out a way early on, when they first got diagnosed, to fit diabetes management into their daily lives. They’re eating healthy. They have a routine. It’s not a big deal for them”* (P16, Family Medicine).

Another family medicine physician (P06) reiterates that he may not investigate potential psychosocial barriers for the relatively few patients who are at goal, because the patient must be addressing them effectively enough; *“If they were always at 7 [HbA1c], then I probably won’t go into a lot of depth about psychosocial barriers ... there’s not all that much we actually have to talk about; they just need refills, and that takes 2 minutes ... because ... whatever barriers they may have ... they’ve overcome [them].... But [that is not the case] for most patients.”*

Situational Factors

Next, I describe the situations that *do* trigger the consideration of psychosocial factors, using data from the physician interviews (see Table 5.5), followed by the results from the online survey (see Table 5.5.4). I segment these situational factors described in the physician interviews into three areas: 1) chronic circumstances, based on *ongoing* situations, 2) new circumstances, based on *emerging* situations, and 3) a change in circumstance, based on a *variation* in situation.

Table 5.5 – Triggers Gathering and Using Psychosocial Information

Chronic Circumstance	New Circumstance	Change in Circumstance
At-Risk Patients – patients from groups the physician considers at higher risk to experience barriers to self-care due to psychosocial factors	New Patient – physician is seeing a patient for the first time	Spike in A1c – patient experiences a sudden elevation in HbA1c for reasons that are initially obscure
Patient not reaching goals on an ongoing basis – the patient is not reaching clinical goals (i.e., their numbers are “not what they should be”)	Initial T2DM Diagnosis – a patient that is diagnosed initially with diabetes	Sudden unhealthy self-care behavior – patient is abruptly not following the care recommendations, discovered through patient consultation, caregivers, or health record (medication refills, appointment no shows)

Chronic Circumstance

I define chronic circumstance situational factors as those affecting patients with persistent conditions over time. Physicians consider psychosocial factors when treating patients who fit their definition of “at-risk patients” and those not reaching goals on an ongoing basis. As shown in Table 5.5.1, physicians gather information such as financial

strain, access to healthy foods, and areas to exercise, to classify adherence barriers and make referral decisions to help patients address them.

Table 5.5.1 – Chronic Circumstance

Psychosocial Trigger	Information Gathered	Use
<ul style="list-style-type: none"> • Financial strain • Mental health status • Payor status • Immigrant status 	<ul style="list-style-type: none"> • Frailty • Psychosocial barriers to performing activities of daily living • Indicators of barriers to “taking care of themselves” 	<ul style="list-style-type: none"> • Classification <ul style="list-style-type: none"> ○ At-risk ○ Complex • Probe for self-care barriers • Prompts further examination • Analysis of the causes of patient behavior

Classifying At-Risk Patients – Complex Patients

Physicians classify some patients as “complex”, based on their at-risk status which can be due to their socioeconomic status, immigrant status, or mental health status. Classifying patients as “at-risk” prompts physicians to routinely consider psychosocial factors and potential barriers to self-care. An internal medicine physician (P08) explains her thinking on how at-risk patients prompt her consideration of potential psychosocial factors:

Psychosocial information is always going to be important, probably more important ... in people who are frail, underserved, somehow at-risk, whether it’s ... people with substance use ... [people with] difficulty in performing independent activities of daily living ... someone who is ... very malnourished, recurrent falls, or other evidence that there’s some impairment in the ability to take care of themselves.

Physicians consider impoverished patients, and those who experience financial barriers, to be at-risk, and consider psychosocial factors categorically; “you always consider them because if they tell you that there’s no way they can afford insulin or if

they tell you that it doesn't fit in their lifestyle, then you know” (P03, Internal Medicine).

Poverty generally presents considerable barriers to care and has a cascading influence on the demanding diabetes self-care regimen. One family medicine physician (P16) outlines the interrelationships which categorically trigger her consideration of psychosocial factors; *“Extreme poverty, recent loss of a job, recently lost housing, house repossessed or kicked out of a rental unit, serious mental illness, or physical illness that’s resulted in significant disability and job loss.”*

Physicians may determine that patients who directly communicate that they are generally struggling with taking care of themselves may be at-risk, triggering consideration of psychosocial factors. Physicians explore self-care barriers when they classify patients as at-risk. Patients with diminished capacity, which can be caused by various psychosocial factors, prompt further exploration of potential self-care barriers. An internal medicine physician (P03) describes the characteristics that he considers which put patients at-risk, and influences his priority of focus areas; *“if you’re not understanding, you have issues and that makes you a complex patient. You might be depressed ... wanting to die quickly. So that’s [what] we need to address.”* A family medicine physician (P12) reflected on his thirty years of experience with at-risk patients, and their difficulty with navigating the diabetes care regimen:

I think the less sophisticated the person, the less success I have with complex [diabetes] regiments; number of pills, testing, multiple injections of insulin. It takes a very motivated, relatively sophisticated person to manage a complex health problem ... I’ll try the best I can, but you have to individualize it. My experience is that [at-risk patients] have relatively little sophistication with regard to health concerns and health issues.

Immigrant status can serve as a trigger for assumptions, which can be imprecise. An internal medicine physician (P09) discusses his experience with immigrant populations and his indefinite approach to determining risk based on a patient's immigrant status. He reflected upon how his classifications may be imprecise, and reflect his own bias:

I think poverty ... In my community, I've cared for a lot of immigrant populations most of my career in the last 15 years or so. Not that all immigrants are impoverished, but immigrant status ... the ability to navigate, the evidence that they're navigating the culture that they've moved to, that they're not socially isolated. We used to talk back in the day about linking social capital ... So, you kind of do that ... Filter through that grid of how nuclear are they, how tightly bonded they are to their immigrant group ... Let's say you came from a small town in Mexico, but you're clearly navigating ... Your temperament is one; that you are not shy. You're really aggressive, and you're not intimidated by the American healthcare culture or the American culture in general ... I will have a less worry about ... That really probably is a subconscious bias.

Patient not reaching goals, numbers “aren't what they should be”

Physicians consider psychosocial factors when a patient is not reaching clinical goals on an ongoing basis, (e.g., when their HbA1c remains higher than goal). In these circumstances, physicians consider psychosocial factors may be the cause, and probe accordingly. An internal medicine physician (P13) describes the circumstance for his patients; *“It's often when somebody's HbA1C is 10 and they're not taking their medications ... Then, we might start to ask some of those questions about ... psychosocial barriers ... [things] we need to be aware of and ... to address.”* Physicians consider psychosocial factors if a patient is not able to follow the treatment regimen, over a period of time. An internal medicine physician (P03) describes when this could occur: *“one circumstance would be recurrent, non-compliance. Like, you're not listening to what I am telling you [...] Then there might be a compounding factor.”* This prompts physicians

to investigate potential barriers to care, which could be due to psychosocial factors.

Physicians attempt to determine if, and to what degree, psychosocial barriers may cause persistent unhealthy self-care behavior. One internal medicine physician (P13) explains:

If their HbA1c is elevated, if their blood pressure is elevated beyond ... the target.... If their cholesterol is elevated beyond what it should be and they are supposed to be taking a cholesterol-lowering medication that should, if taken correctly, at a proper dose, should be getting them to the target goal ... Or they're missing appointments. I think that those are the things that would prompt me then to say, sort of be a red flag ... I should dig into some of those things a little bit deeper.

Rather than an absolute number, an internal medicine physician (P07) speaks to the situation in which the HbA1c and other clinical variables are not improving; *“Their blood pressure’s not under control. They’re on 4 medications ... and they’re blood pressure’s still not under control. Their A1c is not improving ... they’re not responding.”*

Another internal medicine physician (P09) expresses the circumstance more generally; *“When things are just whacked, you know, really out of control clinically. So that’s really the driver to the social-behavioral, psychosocial factor consideration.”*

In addition to the absolute numbers, knowing the *trend* of the clinical data is also a trigger for consideration of psychosocial factors, resulting in conclusions about psychosocial barriers to care. Following a patient’s progress over a period of time can help physicians understand the efficacy of the regimen and discern if psychosocial factors may be presenting barriers to care which result in an inability to reach clinical goals. A family medicine physician (P01) states how he considers psychosocial information to determine barriers if a patient is not reaching clinical goals; *“I would say that those patients that are not able to get to goal are ones that are going to get some increased attention ... there are lots of my patients that get that same exact intervention and still*

have an A1c of 12.0. So, what’s different? That’s why I say ... ‘Yeah, sometimes they [psychosocial factors] matter a whole lot’ ... because it’s nothing to do with their metabolism or anything like that. It’s what’s important to them and what other problems are going on at home to cause them to not be able to follow the treatment plan.”

New Circumstance

I define “new” circumstance as those in which there is a change for the patient or for the physician. As shown in Table 5.5.2, physicians consider fairly distinct psychosocial factors when treating patients new to the physician, and those patients with an initial diabetes diagnosis. For new patients, physicians investigate level of social support and self-care practices to determine what information exchange is necessary in the initial consultation. For newly diagnosed patients, physicians gather information on other chronic conditions and intention to make required lifestyle changes.

Table 5.5.2 –New Circumstance

Psychosocial Trigger	Information Gathered	Use
<ul style="list-style-type: none"> • New patient 	<ul style="list-style-type: none"> • Social support • Background / intake information concerning health behavior, self-care practices • Potential barriers to self-care 	<ul style="list-style-type: none"> • Assess causes of patient behavior (barriers / facilitators) • Assess patient capabilities • Assess patient understanding
<ul style="list-style-type: none"> • New diabetes diagnosis 	<ul style="list-style-type: none"> • Other chronic conditions • Intention to make required lifestyle changes 	<ul style="list-style-type: none"> • Assess causes of patient behavior (barriers / facilitators) • Assess patient capabilities • Assess patient understanding

New Patient

Physicians consider psychosocial factors when seeing a new patient. The first visit can include gathering psychosocial information about various specific psychosocial factors, including level of support, physical activity and general health habits. An internal medicine physician (P07) explains: “... *in the first visit [I] get the information in terms of what support they have and who’s at home.*” Another internal medicine physician (P08) explains how she asks about physical activity, and potential barriers; “*[I ask new patients] about their health habits and the things that affect those health habits ... [I] ask them about what they do for physical activity ... [I] ask them about what are the things that they’re doing to manage what makes it easier or harder [for them].*” P07 also explains her probes concerning mental health; “*I will ask about mood as well ... that might give me a sense [of their psychosocial factors].*”

Psychosocial information gathered in the initial visit is by no means comprehensive, but it can be helpful for physicians to get an initial understanding of the patient; “*it’s not gonna be as deep a dive, but still getting at least some of those initial factors*” (P08, Internal Medicine). Physicians can also get background information on new patients via intake questionnaires, which collect information on self-care habits, such as dietary practices. As (P15, Family Medicine) notes, “*[At the] first appointment ... I will have a lot of ... information ... [our] 25-paged intake packet ... includes a diet diary and [things] ... that we think make a difference in people’s health ... so we ask about it. I think we have the SF-20 (20-Item Short Form Health Survey) ... in there and ... a lot of different measures of just kind of health and well-being*”

Physicians recognize that information that addresses the full range of psychosocial barriers which could influence care decisions, cannot be gathered in the

initial visit. The volume of information concerning diabetes, and the practical constraints on how much the patient is able to digest, dictate the extent to which physicians can collect psychosocial information with a new patient. P10 (Family Medicine) explains: “...it’s hard ... I almost feel like we need 2 or 3 new patient visits because it ends up being so much information to a patient ... there’s only so much a patient’s gonna hear from you, or really understand ... sometimes [patients] come [directly] from the hospital ... they have a lot of new stuff going on that they didn’t even know they had until they went to the hospital”

New Diabetes Diagnosis

A new diabetes diagnosis may prompt physicians to consider psychosocial factors. As P13 (Internal Medicine) said, “*certainly, a new diagnosis of diabetes when somebody is hearing this for the first time [prompts considering psychosocial information]*” This is particularly important if a patient has preexisting chronic conditions; “*they’ve had heart failure or a heart attack and diabetes and cholesterol and it’s all new to them*” (P10, Family Medicine). Physicians recognize the scope of the effect on the newly diagnosed patient; “*a new diagnosis of diabetes ... you think about how that information’s gonna interact with somebody’s views of themselves, with their environment ... in some cases, [they’ll be getting] much more healthcare and be followed much more closely than they had been used to before ... especially if we’re having to start them on insulin [right away]*” (P13, Internal Medicine).

Change in Circumstance

I define change in circumstance as when there is an obvious change in clinical numbers, or sudden unhealthy self-care behavior that is inconsistent with the recommended diabetes care regimen. As shown in Table 5.5.3, physicians consider

psychosocial factors in the following circumstances: a “spike” in HbA1c and sudden, unhealthy self-care behavior. Physicians gather information on potential barriers to care, such as financial strain and missed appointments.

Table 5.5.3 – Change in Circumstance

Psychosocial Trigger	Information Gathered	Use
<ul style="list-style-type: none"> • Spike in HbA1c • Sudden unhealthy self-care behavior 	<ul style="list-style-type: none"> • Sudden psychosocial barriers <ul style="list-style-type: none"> ○ Financial strain ○ Missed appointments 	<ul style="list-style-type: none"> • Analysis of the causes of patient behavior • Assess needs arising from barriers to self-care • Referral decisions

Spike in A1c

Psychosocial factors are considered when the physician observes an abrupt increase in HbA1c. Physicians specifically mention that a sudden increase in HbA1c (i.e., a “spike”) triggers consideration of psychosocial information; *“so if you’ve seen the patient, if it’s not the first visit, and you see their A1c spiked ... it could be that trigger to consider psychosocial factors”* (P06, Family Medicine). Another family medicine physician (P15) explains how she might probe for barriers to self-care when she observes a sudden change in HbA1c; *“I think that ... either like a clinical change ... a spike in A1c ... I’m probably gonna probe more into why I think we may be having difficulty.”*

Another family physician (P01) explained how in these circumstances he may consider a decision to get support for access to medications:

For those patients who either historically have had great successes with their sugar control, and then all of a sudden they’re having a quarter where their A1c jumps up ... from a 7 to an 11 ... in 1 quarter ... almost to a person that’s either someone who has had a total lack of financial resources, so they were well-controlled on medication X and now they’re no longer able to get that medication.

Sudden unhealthy self-care behavior

Psychosocial factors are explored if the patient is not able to achieve various elements of self-care. Physicians consider psychosocial factors because they believe a sudden change could stem from a patient not following the treatment regimen due to various self-care barriers that have recently emerged due to shifting psychosocial factors. A family medicine physician (P12) explains his rationale for considering psychosocial factors; *“I would say, if there’s a change, either a disease that was under a certain level of control is now out of control.”* Another family medicine physician (P12) describes how a patient missing appointments prompts investigation regarding potential psychosocial factors. A decision to enlist other members of the care team to help locate these patients is based on what information he is able to gather. He shared his experiences with diabetes patients who may experience sudden, unhealthy self-care behavior. This type of sudden decline in healthy self-care behavior is usually a signal that the patient is experiencing barriers to care based on psychosocial factors, resulting recommending care managers try to locate these patients, *“If they [diabetic patients] were really adherent, and, all of a sudden, they disappeared off the face of the earth.... [some] would be using ... drugs ... or were ... in jail ... but we did the jail clinic so that was pretty easy to figure out. We would know that.... The next time I went to the jail, they would ... be on my patient list ... so generally, if they disappear, we would have our case managers give them a call or track them down.”*

Survey Findings

I now detail the survey findings concerning the triggers raised in gathering and using psychosocial information. By a large margin, survey respondents most frequently indicate that psychosocial factors are important to consider *in all circumstances*. As

shown in Table 5.7.4, a wide majority of responses across respondent roles indicate that they consider them in all circumstances (as noted in the table, survey respondents could indicate more than one source). In this way, survey results differed from the interview results. Nonetheless, survey results demonstrate that for some practitioners, each of the categories of circumstances (chronic, new, changed) serve as specific triggers to the consideration of psychosocial factors.

Table 5.5.4 – Circumstances when Psychosocial Factors are Important to Consider

	Total (<i>n</i> = 204)	Primary Care Physicians (<i>n</i> = 41)	Nurse Practitioners & Diabetes Educators (<i>n</i> = 163)
In all circumstances	182 (44.2%)	35 (29.7%)	147 (50%)
Chronic circumstances			
Patient with multiple chronic conditions	34 (8.3%)	11 (9.3%)	23 (7.8%)
Patient with persistent, low treatment adherence	33 (8.0%)	11 (9.3%)	22 (7.5%)
Patient from low-resourced areas	31 (7.5%)	12 (10.2%)	19 (6.5%)
Patient with diagnosed mental health condition	29 (7.0%)	10 (8.5%)	19 (6.5%)
Patient with undiagnosed mental health issues	22 (5.3%)	9 (7.6%)	13 (4.4%)
New circumstances			
Seeing a new patient	33 (8.0%)	12 (10.2%)	21 (7.1%)
Seeing a work-in patient	14 (3.4%)	6 (5.1%)	8 (2.7%)
Change in circumstances			
Change in health status (e.g. spike in HbA1c, additional diagnosis)	34 (8.3%)	12 (10.2%)	22 (7.5%)
TOTAL	412	118	294

Note. Respondents could indicate more than one circumstance.

5.6. Patient Assessment

In using psychosocial information, practitioners seek to make several judgments that then inform their clinical decisions. I now outline how psychosocial information is used by physicians in their general assessment of patients. As shown in Table 5.6, these judgments include: 1) the causes of patient behavior, 2) patients' capabilities, in light of psychosocial barriers and facilitators that they may be experiencing; and 3) patients' understanding of their diabetes care regimen.

Table 5.6 – Psychosocial Information Use for Patient Assessment

Practitioner Assessment Type	Practitioner Judgments	Relevant psychosocial factors considered
<ul style="list-style-type: none">• Causes of patient behavior	<ul style="list-style-type: none">• Barriers and facilitators experienced	<ul style="list-style-type: none">• Life stressors• Social support• Health beliefs and preferences
<ul style="list-style-type: none">• Patient capabilities	<ul style="list-style-type: none">• “Can they do it?”	<ul style="list-style-type: none">• Mental health• Health literacy• Payor status• Financial strain• Life stressors• Social support
<ul style="list-style-type: none">• Patient understanding	<ul style="list-style-type: none">• “Can they understand it?”	<ul style="list-style-type: none">• Health literacy

The causes of patient behavior

Psychosocial information is crucial for the physician to understand patient adherence practices, in particular, why the patient may not be following the diabetes care recommendations. A full understanding of self-care behavior is reliant upon understanding if the patient may be experiencing psychosocial barriers to care, such as financial barriers which may intersect with other psychosocial factors. Practitioners described using information regarding life stressors, mental health, and social support in

such causal analyses. For example, an internal medicine physician (P13) describes how becoming aware of a change in a patient's life stress and a loss of social support was responsible for changes in his previous self-care behavior: "*a gentleman ... in his mid-50s, poorly controlled ... for a while ... we were trying to escalate his medications and trying to get him to take his insulin routinely ... We didn't realize that he had changed his job recently to a 3rd shift. He's had all kinds of social challenges. He previously was a cocaine abuser. He stopped that. He had a girlfriend who was a healthcare provider ... he started [to] ... clean his act up ... but then they broke up ... talking about the psychosocial stuff ... [the girlfriend] was a supporter in his care, but when they broke up that ... provided him, I think, with enough confidence ... to do some of the stuff on his own.*" A family medicine physician (P15) also shares a patient case that helps illustrate his use of psychosocial information to identify life stressors and poor mental health as causes of worsening patient self-care behavior:

His diabetes was poorly controlled.... I knew he was very motivated, and I couldn't figure out what was going on ... he was ... very highly functioning, worked really hard on his diet, almost obsessively ... was exercising regularly ... then his A1c ... jumped to ... almost 10 ... I was trying to figure out what had happened ... as we were talking, there was this whole complex story that unrolled ... his wife had gotten diagnosed with cancer, so that was one layer ... the next layer was... they have been struggling in their marriage ... he had actually been planning on asking for a separation. And then ... she got this cancer diagnosis. So then he felt like he couldn't leave her.... Even though he came in to talk about his diabetes, we ended up talking about his depression because he was now ... in a marriage that he didn't want to be in, and caring for this woman who had this very aggressive cancer diagnosis.... He was like, "I can't leave her now." ... he both has the caregiver stress and the stress of [being in] a relationship that [he didn't] want to be in anymore, and [he's] really depressed.... That definitely changed the way we were talking about his diabetes ... really shifted into a conversation about self-care, and how [can] we help [him care for himself] ... then how does the diabetes care follow from that?... He said, "Well, I haven't really been ... eating as well ... and I haven't really been exercising."

Patient capabilities

A key assessment decision physicians make is to what degree patients are able to manage themselves, their environment, and their health conditions. The ability to “*manage their lives*” (P01) is an important assessment. One family medicine physician (P16) explains that the assessment is based on how the patient responds to her questions, “... [answers] give you an understanding of how much control they have over their lives and how routine their lives are, and [any] stressors there are” (P16, Family Medicine).

Patient understanding

A patient’s ability to understand their illness and its treatment is also an important assessment that physicians make using psychosocial information. For example, a family medicine physician (P16) with almost twenty years of experience in various care settings speaks to the impact of how extreme cognitive impairment can influence self-care in general; “*It’s complicated to manage diabetes, but if you’re cognitively intact and have some resources, it’s doable, even with other illnesses ... [If the patient is] either very sick or very cognitively impaired ... you can’t really do it.*” Physicians consider mental health issues in order to gauge a patient’s ability to follow particular aspects of the care regimen, as not following recommendations could put them at considerable clinical risk:

It might be dangerous for the patient if we’re doing something like administering insulin or having them take an oral medication that will drop their blood sugar. [If] they are going through a manic episode or they ... have active psychosis. At best, we’re not gonna be doing anything with their treatment. At worst, we’re hurting the patient with that treatment. So, in that situation, there are some things that take a higher priority and that very clearly affects that decision making. (P07, Internal Medicine)

A patient’s health beliefs and perceptions about treatment options, especially how insulin and using needles impact their preferences, is also a factor relevant to patient understanding. Some patients believe that administering insulin is uncomfortable, or

painful. One physician explains, *“injecting could be up to 4 times a day ... it’s a fuss, they don’t want to be in pain”* (P04, Internal Medicine). A family medicine physician adds, *“a lot of them really are afraid of the needle”* (P12, Family Medicine). Some patients are reluctant to start insulin because they believe that insulin may make them sick or even kill them. Another family medicine physician (P06) shares his patient experience, *“for some patients, there was the fear of the association of death with insulin.”*

These beliefs primarily emanate from the patient’s interactions with and observations of the experiences of those close to them—friends or family members with diabetes who may have had to take insulin. Physicians from various care settings discussed their experiences with patients with these beliefs about insulin and the use of needles. As one family medicine physician (P12) shared, *“a lot of them have family members or friends who are on insulin. And more often than not, they’re varied experiences, but a lot of them had negative feedback from other people ... like they don’t like injecting themselves....”* As P10 asserts, *“There’s lots of misconceptions about it.... A lot of patients would always tell me, ‘When you get insulin you get really sick.’*

Physicians noted that these pre-existing, negative beliefs and associated misunderstandings are important to identify since they could stand in the way of optimal treatment for a given patient. As such, practitioners consider health beliefs in the context of their overall assessment of patient understanding.

Psychosocial information helps to inform physicians’ assessments of patient understanding of their diabetes care regimen, which helps them forecast the self-care barriers they may confront.

In sum, psychosocial factors play a key role in informing the physician's overall assessment of a patient, as they attempt to recommend a treatment regimen appropriate for the patient. It is to this issue that I now turn.

5.7. Making the Clinical Decision

As shown on the cognitive map (see Figure 5.2), psychosocial information helps physicians determine what treatment is most appropriate for the specific patient, at that particular time. For example, a patient's social circumstances can change quite frequently, and assessing their overall situation is done, at some level, during each visit. Psychosocial information, gleaned primarily from the patient, influences the physician's clinical judgment concerning what regimen is best, informed by their assessment of what may be currently effective. I now detail how psychosocial information is used for four types of diabetes care clinical decisions: 1) medication management, 2) recommendations, 3) determining target level of control, and 4) referrals.

5.7.1. Medication Management

Psychosocial information helps to inform medication management decisions. As shown in Table 5.7.1, physicians use information such as payor status, financial strain, social support, health beliefs, and occupational demands to inform judgment concerning how well a patient is "managing their life" which helps determine the medication regimen appropriate for the patient's circumstances. Medication management decisions include starting a patient on insulin, and determining which type of insulin is appropriate.

Table 5.7.1 – Psychosocial Information Use for Medication Management

Practitioner Judgments	How Used	Medications Decisions
<ul style="list-style-type: none"> • Barriers and facilitators experienced 	<ul style="list-style-type: none"> • Determine feasibility of medication options • Determine needs emerging from barriers to medication adherence 	<ul style="list-style-type: none"> • Select medication type • Start medication therapy (i.e., pills, insulin)
<ul style="list-style-type: none"> • “Can they do it?” 	<ul style="list-style-type: none"> • Determine feasibility of medication options • Assess clinical risk of medication options 	<ul style="list-style-type: none"> • Calibrate medication regimen complexity and intensity
<ul style="list-style-type: none"> • “Can they understand it?” 	<ul style="list-style-type: none"> • Determine feasibility of medication options • Determine needs for patient education 	<ul style="list-style-type: none"> • Educate patient

Select medication type

Insight into the barriers experienced by patients, and their related capabilities, plays a role in physicians’ judgments about the feasibility of different medication options for their patients. In turn, this leads physicians to prescribe medications that were deemed to be most feasible from the point of view of patient adherence. For example, health care payor status (closely associated with financial strain) means that some physicians actively consider medication cost when selecting medications for patients, thus making medication decisions according to a patient’s ability to pay. One family medicine physician (P10) who practices in an urban, community clinic explains:

...we’re very aware of how much medicines are. We either get medicines that are \$4 at Wal-Mart or that are discounted ... or we get it through an assistance

program. We're not just gonna write you random things that we know you're not gonna be able to purchase ... Because then you're not completing the treatment that we're recommending.... We make sure that we only recommend medications that a patient's gonna be able to obtain. We're not just gonna write it [just to] write it. We want the patients to actually take the treatment.

A major medication type decision affected by payor status as a barrier also concerns the type of insulin prescribed: specifically, fast-acting or slow-acting insulin. An internal medicine resident (P04) shares, “[I consider] what type of insurance would need to cover it [medication]. Typically, there are two main regimens ... long and short acting ... the longest one is quite expensive ... most insurance companies cover it by now, but there are some instances where ... it's not covered.... And of course all Medicaid policies aren't the same.... So that's another thing that goes into our consideration.... Cost would be a major ... psychosocial factor ... the ability to pay [for certain types of insulin].”

Similarly, a family medicine physician (P10) practicing in a community clinic in Texas shared how financial barriers due to lack of insurance coverage determine the insulin type available to some of her patients, because of their immigration status and lack of access to prescription assistance programs:

The Levemir and Lantus ... the 24-hour insulins ... are very expensive ... the slow-acting ... NPH [Neutral Protamine Hagedorn] 12-hour insulin ... is cheap ... a lot of our patients are on [Levemir and Lantus]. The way we get them is through assistance programs that the manufactures provide, but they are now requiring a social security number for these applications ... they used to accept a tax ID number [so if patients] had a tax ID, they could apply and get assistance. Well, they're rejecting those now.... If they don't have a social security [number], which a lot of our patients that are undocumented [don't have, they] can't qualify, can't receive those, and so we're stuck using older insulins, that are harder to manage, and harder to titrate into ... If you give it too strong, it drops them too low. If you don't give it strong enough, they don't get low enough. And it's a little bit more complicated ... all based on the patient, being undocumented, not having a social security number, not having health insurance, and not being able to get their insulin.

The cost of fast-acting insulin also causes physicians to select the slower-acting version of insulin in cases of general financial strain as opposed to just payor status. An internal medicine physician (P03) explains how out-of-pocket medication costs factor into his medication management decisions, which may be suboptimal clinically, because of financial considerations:

Ideally you would prefer for them to be on a short acting and a long acting ... Like TIDASE 3 times daily before meals and a long acting Basal. But then that's ... a lot more expensive than an intermediate acting insulin.... Many times they just come tell you, "I can't afford that insulin." [Because they] can't afford it.... [They run] out of insulin... So, a lot of people have to be on 70-30 [intermediate acting insulin] ... mainly because of cost reasons ... which is not really ideal.

Start medication therapy

Start Pills

The physician's assessment of a patient's capabilities and barriers/facilitators is considered in light of treatment options that typically occur before medication therapy: lifestyle changes in relation to diet and exercise. Specifically, if a practitioner does not think a patient can make the requisite changes, more aggressive treatment options may be initiated sooner. For instance, an internal medicine physician (P13) describes a representative patient case in which he makes a decision to start medication based on his predictions regarding a patient's future self-care behavior based on his/her financial barriers:

so if I have a patient, for example, who is not as well-controlled as they could or should be with diet and exercise alone, and they have low socioeconomic status, live in a low income neighborhood, where it's not safe for them to exercise outside, it's difficult for them to have affordable access to healthy food, I might be less confident that they're really gonna be able to get by on diet and exercise alone. In that case ... we may need to go straight to medication.

Start insulin

The decision to start insulin is one of the key medication management decisions that requires judgment informed by psychosocial factors. As such, I now describe the psychosocial factors which specifically influence the decision to start insulin. Patient understanding, as manifested through their health beliefs, may also influence the decision to educate patients about adding insulin to their treatment. Physicians note that adding insulin to the diabetes care regimen increases its complexity. An internal medicine physician (P13) acknowledges what a big adjustment adding insulin to a medication regimen means for some patients; *“For some people, it means they’re gonna have to take medication every day for pretty much the rest of their lives. When they’re not used to doing that ... [it] could be a big gear-shift. So I think about those things very much in that situation [starting insulin].”*

Health Beliefs and Preferences

Physicians explain how strong health beliefs are important factors to understand and consider as they deliberate over the decision to start insulin. They attempt to understand these concerns and when they encounter patients with intense fear of insulin, they determine the patient’s needs for patient education. Following this, they attempt to educate the patient on what starting insulin might mean for them, while addressing their misconceptions: *“... I’m like, ‘No, it’s because you’re really sick with diabetes that you need insulin. It’s the high sugar that’s causing this, not the insulin’”* (P10, Family Medicine). Physicians often have discussions with their patients concerning these health beliefs and preferences over a period of time, as the physician educates the patient, and they negotiate the significant decision to add insulin to their care regimen. Notably, efforts to persuade are woven into efforts to educate. A family medicine physician (P10)

shares, “[what] happens ... a lot is we have patients that are very resistant to insulin and they would do much better if they took insulin early on ... we have a hard time ... we’ll spend several months trying to convince someone that they’re gonna need insulin because they’re just not getting anywhere on maximum doses of oral medications. And then once they finally get on insulin, they’re able to see some improvement.” An internal medicine physician (P12) explains that he discusses insulin with patients well before it is clinically necessary to include it in their care regimen. His rationale is to quell the health belief that diabetes is a simple disease to treat, one that may just require a pill. He makes the decision to educate diabetes patients early on; “I throw the insulin concept out onto the table very, very early on, so they kind of understand what the disease is. Because a lot of people [believe], ‘All I have to do is take a pill.’ And then think they can get off the pill ... Like you take an antibiotic for strep throat, you take this for a period of time, then I can come off it. Or that once their glyco is getting better, ‘now I can come off the insulin.’ ... I’ve been through this path before, so I start the discussions earlier on.”

Despite their efforts to educate, physicians may not start patients on insulin until long past the time when it could benefit them. This is because some patients do not believe they are sick, or sick enough, to need insulin. They perceive the additional responsibilities as considerable inconvenience to their care regimen; they surmise that insulin is not worth the benefit. Patients may not “feel” sick, therefore they do not believe or fully understand the implications of chronic high blood glucose. It can be difficult to convince asymptomatic patients to take on the considerable life changes required from adding insulin to the care regimen; “I had many more patients who were not at 7, or probably not even at 8, and needed to start insulin, but they really didn’t want to. [It is]

hard to convince the patient to start insulin, to use a daily injection and check their sugars, to poke their finger several times a day, as well as inject themselves with the medication, because their blood sugar ... they can't see and they can't feel ... when their blood is abnormal ... [it] puts them at risk for a health event they've not yet experienced" (P06, Family Medicine).

Social Support

The vital decision to start insulin requires physicians to assess feasibility and clinical risk in relation to the patient's level of social support. They approach this decision thoughtfully and seek a full understanding of the benefits and risks based upon level of social support; *"you really have to be careful ... especially if they don't have assistance at home ... some people will have poor vision because of glaucoma, [or] cataracts. And they're not reliable to give themselves insulin. They're not reliable to follow a glucometer ... because they might mis-read how much they're getting and [because] they can't see well.... I've had a couple of patients like that ... I definitely have not pushed insulin aggressively ... for their own safety ... because it's just not safe"* (P10, Family Medicine).

Life stressors

Employment responsibilities are a life stressor that physicians consider in assessing the feasibility of starting insulin. A family medicine physician (P17) shares how he considers employment in making this decision. Patients who work in certain occupations may experience barriers to adhering to the medication regimen which includes insulin injections; *"if I start someone on a regular insulin, getting insulin shots 3 times a day and getting your Accu-Cheks (glucometer) 3 times a day ... [it] is just difficult for a working-class patient. Where are they gonna put their pen and needles? It's*

just impossible. I won't say impossible. It's difficult. Let me put it this way ... you'll see less compliance on those patients or less results outcome, because they may miss the afternoon dose."

Calibrate medication regimen complexity and intensity

The assessment of whether a patient “can do it” is important in relation to decisions about the clinical risk associated with complex or intense medication regimens, of which regimens including insulin may be an example. In particular, the barrier of a lack of social support is evaluated in relation to the clinical risk of an intense and complex treatment regimen; physicians consider the number and type of medications prescribed to the patient in relation to support with medication behavior. An internal medicine physician (P08) based in Michigan describes a patient case in which low social support influenced medication selection —due to the risk of episodes of low blood sugar; *“there's nobody to check on him, nothing. So, my goals for him were actually convincing him that, we needed to back off on the medications that his prior physician had been giving him.”*

In some cases, treatment intensity may also be lowered based on concerns about the harms associated with a high risk of non-adherence. Indeed, some practitioners even speak about suspending treatment in situations of mental health challenges. As this physician said, *“[If the patient is] either very sick or very cognitively impaired ... you can't really do it.”* Additionally, P07 notes that patients not following recommendations due to active psychosis could put them at considerable clinical risk:

It might be dangerous for the patient if we're doing something like administering insulin or having them take an oral medication that will drop their blood sugar. [If] they are going through a manic episode or they ... have active psychosis. At best, we're not gonna be doing anything with their treatment. At worst, we're

hurting the patient with that treatment. So, in that situation, there are some things that take a higher priority and that very clearly affects that decision making.
(P07, Internal Medicine)

Health Literacy

Health literacy is another factor considered in determining appropriate regimen complexity. An internal medicine physician (P13) describes how he may establish a higher HbA1c target based on a patient's ability to comprehend required self-care behavior required, *“if I feel like the person does not have a sufficient level of understanding of how to take the medication, why we're doing it, how to do it safely ... then we may go with a less aggressive, safer route for them ... the oral versus injectable medication is one example of that sort of thing... That will still be better than no treatment at all.”* A family medicine physician (P10) also considers health literacy and patient safety to decide on a higher HbA1c target, *“some patients don't always know how to even read their glucometer... you really gotta be careful on how aggressive you are with insulin. If you risk them dropping their sugar too low, they don't even know how to read or record the glucose ... that could be really dangerous for them.”*

5.7.2. Recommendations

Psychosocial information helps to inform recommendation decisions because physicians use this information to make judgments regarding patients' behavior, their capabilities, and the barriers/facilitators that they face. As shown in Table 5.7.2, physicians use information such as financial strain and employment demands to perform pattern matching described in chapter two (section 2.4). A family medicine physician (P15) indicates, *“If I know that somebody [is] from a lower socioeconomic status ... that ... is gonna be much closer to the front of my mind and ... the conversations that we're*

having ... [and] the recommendations I'm making." Further, they use psychosocial information to advise, educate, counsel and determine the feasibility of the patient following the care regimen. Physicians try to incorporate psychosocial factors into their care recommendations so that their suggestions are practical (i.e., within the patient's reach of performing). In this section, I describe the how psychosocial information is used, according to the following specific recommendations decisions: frequency of follow-up visits, exercise, dietary and lifestyle recommendations, and supporting patients to prioritize their own self-care.

Table 5.7.2 – Psychosocial Information Use for Recommendations

Practitioner Judgments	How Used	Recommendation Decisions
<ul style="list-style-type: none"> • Barriers and facilitators experienced 	<ul style="list-style-type: none"> • Determine needs emerging from barriers 	<ul style="list-style-type: none"> • Adjusting frequency and timing of follow-up appointments • Adjusting exercise, dietary behavior recommendations
<ul style="list-style-type: none"> • “Can they do it?” 	<ul style="list-style-type: none"> • Determine feasibility of recommendations 	<ul style="list-style-type: none"> • Acknowledging patient autonomy
<ul style="list-style-type: none"> • “Can they understand it?” 	<ul style="list-style-type: none"> • Determine needs emerging from patient's level of understanding 	<ul style="list-style-type: none"> • Supporting patients to prioritize self-care (e.g., exercise)

Frequency and Timing of Follow-up Visits

At a high level, diabetes care appointments can occur at fairly regular intervals, however patient circumstances based on psychosocial factors can dictate how often follow-up appointments are necessary, and the timing of those appointments. To determine whether such adjustments are warranted, physicians attempt to determine a patient's needs as arising from the psychosocial barriers and facilitators that they

experience. For example, patients may use their previous experiences with patients in similar circumstances to determine these needs. An internal medicine physician (P09) shares how he matches the characteristics of current patients to patterns from previous patients, which can inform the decision for frequency of follow-up visits:

I might ask a patient to come back and visit me more frequently than I would another patient. And that's where this profiling issue really comes up. I look at you and my pattern says, 'Oh, you're one of those kind of folk. You're low income. You're from a racial minority group. You're the matriarch of the family.'... Something triggers my thinking saying, 'Oh, you're gonna need a lot more support than if you were the male, diabetic, who goes to work, but doesn't have to go shopping, doesn't have to do the cooking, doesn't have to do the cleaning.'

For example, when physicians perceive that patients may need support for understanding care recommendations, they will attempt to schedule clinical visits when family members can also attend. A family medicine physician (P01) who sees patients from various parts of the world who have relocated to the Northeast part of the United States, shares his approach to scheduling visits that may help patients who experience transportation barriers to attending follow-up appointments: “...more than half of our patients are non-English speaking. So, it's a lot easier to book an interpreter to see me, and to see the diabetic educator back-to-back, so we book ... the van to come [and pick them up]. The likelihood that a person's gonna miss 1 visit versus 2 visits is less, so we try and, we call them a tandem visit; just back-to-back.”

Adjusting Dietary Recommendations

Nutritional guidance and dietary recommendations are influenced by psychosocial factors, such as financial barriers, culture, employment and other lifestyle demands. Physicians acknowledge patients' autonomy concerning dietary choices, and attempt to encourage them to make healthy dietary choices; “*What the patient can decide is how*

much ... they are gonna eat and what are they gonna eat and when are they gonna eat ... I can't really decide but I can advise, I can suggest" (P16, Family Medicine). An internal medicine physician (P07) explains how recommendations are somewhat limited by the extent to which she can control patient's eating behavior, contrasting dietary recommendations with medication prescriptions, *"food ... It's not like a medication. You can't really prescribe food, right, because everyone has their own preferences.... understanding their financial situation as it pertains to food helps."*

One way of tailoring dietary recommendations is to recommend specific foods, advice that is adapted to psychosocial factors such as financial barriers. As P08 explains, recommendations are made while: *"...making sure of something he could eat ... something that he could afford, because he was on a fixed income ... psychosocial circumstances [have] a huge impact on how I worked with them for their diabetes"* (P08, Internal Medicine).

Specific dietary recommendations may also be made in relation to a patient's eating schedule. For example, these recommendations may be informed by a patient's life stressors: *"...stress they have in their work.... People travel a lot ... depending on ... their job duties. We probably make decisions in terms of what kind of meals they can have"* (P11, Internal Medicine). Furthermore, employment demands may guide physicians toward recommendations aimed at educating and helping them address barriers, in order to support them in their efforts to follow the diabetes dietary regimen:

Depending on ... their job duties ... we probably make decisions in terms of what kind of meals they can have, where they are, when they buy, when they cook ... How many breaks they can take ... we have to kind of educate them really well, "even though I understand that you are really busy ... in spite of that, you need to take care ... to maintain your disease ... if you do these lifestyle modifications it helps maintain your blood sugar levels." (P11, Internal Medicine)

Supporting Patients to Prioritize Self-Care

In relation to recommendations, practitioners may also opt to support patients to prioritize their own self-care in light of competing responsibilities, such as patient caregiver responsibilities. Physicians attempt to encourage patients to not neglect themselves when confronted with lifestyle demands; *“[I tell patients with significant caregiver responsibilities] ‘you need to take care of yourself. Is there a way that, on a daily basis, you can still remember to do the things you need to?’ [I] remind them, ‘You gotta take care of yourself in order to take care of other people.’”* (P05, Endocrinology). An internal medicine physician (P08) shares how she attempted to support a patient with significant caregiver responsibilities; *“I wanted to work with her ... first focusing on diet and exercise, because I knew she was serving as a caregiver for her husband who was blind, and was spending a lot of time with him. So, [I] talk[ed] with her about how to carve out some time to step away from her caregiver duties so that she would be able to ... exercise and some of these other things.”*

5.7.3. Determining Target Level of Control

Psychosocial information helps to inform decisions about target levels of control. These decisions can be made at each clinical visit based upon patient circumstances driven by psychosocial factors. They can be revisited and adjusted, based on the extent to which the patient has reached a prior HbA1c goal. Psychosocial factors influence the setting of appropriate targets for control because the results of a risk assessment may mean that the objective of treatment may be trying to reduce the risk of hypoglycemic episodes, rather than attempt to create a regimen better suited for more ideal circumstances. As shown in Table 5.7.3, physicians use their judgments about barriers/facilitators, patient capabilities and understanding to help assess risk and

determine feasibility of “tight” control for HbA1c (i.e., HbA1c of 7). Patient preferences, based on how the patient “feels” also inform appropriate target levels.

Table 5.7.3 – Psychosocial Information Use for Target Levels of Control

Practitioner Judgments	How Used	Target Decisions
<ul style="list-style-type: none"> • Barriers and facilitators • ”Can they do it?” • “Can they understand it?” 	<ul style="list-style-type: none"> • Assessing clinical risk • Determining feasibility of different levels of control 	<ul style="list-style-type: none"> • Choose HbA1c target • Acknowledging patient decision-making autonomy

Choose HbA1c Target

Establishing an appropriate target may also involve intersecting decisions, determining risk and feasibility based on psychosocial information. For example, an internal medicine physician (P09) states how assessment of both factors inform the choice of HbA1c target: “...people who have erratic eating schedules, such as homeless people, or people that have really, really strict incomes, and their social environment’s really unstable ... [I’ll have] them be less than 8 rather than less than 7 as a control point on their A1c.” I now discuss issues of risk and feasibility in greater depth.

Assess risk

Patient capabilities are assessed in relation to clinical risk. Risk of low blood sugar is a vital concern for patients who lack social support, thus spending considerable time alone. For example, a HbA1c target *above* seven may be appropriate, given their circumstance. A family medicine physician (P14) discusses how demands, exacerbated by low social support, drive her rationale for diverging from establishing strict control goals; “*somebody who had, maybe a lot going on in their life, and other issues.... I would continue to work with them about their diabetes but, [I would not decide for] intense control.*” A family medicine physician (P16) describes how she determines appropriate

control targets based on financial strain; *“If somebody doesn’t have a refrigerator or regular place to live, electricity, regular meals ... We would never tightly control this guy. He would die.... I’d rather [him] have a HbA1c of 14 than try and manage insulin.... It’s not good, but the alternative is killing them. So, that’s worse, right?”* An internal medicine physician (P08) shares a case in which a patient’s low level of social support had considerable influence on establishing an appropriate HbA1c goal:

He would go to Meijer’s [regional supermarket chain based in the Midwestern United States] everyday, because that was his major way of having contact with humans ... So ... I’m not gonna try to get him under a HbA1c of 7, because I think he’s at really high risk.... if he did get hypoglycemia at home, he would probably die, to be perfectly honest ... because there’s nobody to check on him, nothing.

Determine feasibility

Physicians attempt to determine feasibility of a patient following a specific care regimen required to reach a certain HbA1c target. Financial strain can have considerable influence on establishing a target outside the guidelines. Physicians may explicitly divert from known guidelines due to the patient’s financial situation: *“...typically I would consider them [financial barriers] all the time. So, when a patient presents I have to think about the guidelines. Of course, there’s always sometimes where you need to break them [financial barriers which dictate certain insulin which influences A1c target]”* (P04, Internal Medicine).

Patient preferences also influence feasibility of specific targets. Physicians gauge the applicability of the guidelines, and may consider them less or intentionally disregard them, based on patient preferences. An internal medicine physician (P03) expresses how important understanding patient preferences are. He recognizes that ultimately, for outpatient diabetes care, the patient retains final authority and autonomy over the vast number of recommended self-care decisions. The patient makes decisions for dietary

practices, medication behavior, and attendance at clinical appointments — key dimensions of the care regimen — regardless of physician’s objectives for them; “patients can refuse treatment, right? They can take whatever [medications] they want. You can’t really force it, right?” Patient preferences are a key factor in the decision to establish an individualized HbA1c target. A family medicine physician (P01) emphasizes how patient preference may supersede the guideline, or what he may believe is appropriate for the patient:

[We must] make sure we’re assessing both what’s important to the patient as well as what we feel is important based upon evidence-based medicine. Because it’s one thing to come down from the mountain saying, “Well these numbers are important.” But again, if you can’t partner with them to say, why it’s important, or why it’s specifically important to them, I don’t think you’re gonna get a lot of traction.

Acknowledging patient decision making autonomy

An internal medicine physician (P08) described a patient case where a target was established based on patient preference: “I don’t know if it’s a phobia, but he essentially refuses to take medications. So he’s falling outside the [HbA1c] guideline.” Another internal medicine physician (P03) describes how patient preferences, based on how they feel, informs the decision to establish a specific, individualized target above the HbA1c guideline; “say ... their HbA1c as 8, right? So, a person comes in saying, ‘Doc, this is where I feel comfortable, I like my blood sugar at 140, I don’t like it when it’s 80, I just don’t feel strong enough, right? I just don’t have the energy to do what I need to do with life, I don’t care what the guidelines say.’ ... then you just document it and let them be happy because people know their body more than you know it, right?”

5.7.4. Referrals

Physicians make referral decisions to help assess and get support for self-care barriers that cannot be addressed during the clinical consultation. Referral decisions are *primarily* driven by judgments regarding psychosocial factors that present barriers to self-care. Referrals are made for counseling, behavioral health, and social work. Psychosocial information helps to inform these referral decisions. As shown in Table 5.7.4, physicians use psychosocial information to help determine barriers to self-care, and the degree to which a patient understands the treatment regimen. Health literacy, financial strain, and access to healthy foods and places to exercise help inform judgment on potential barriers to care, and what steps to take to help address them. Practitioners make referrals to help address barriers to comprehension of the treatment regimen, and support with dietary and physical activity recommendations. A family medicine physician (P14) describes her referral decisions quite simply, “*I just listen to what they say then I ... connect them with [needed] resources.*”

Table 5.7.4 – Psychosocial Information Use for Referral Decisions

Practitioner judgments	How Used	Referral Decisions
<ul style="list-style-type: none"> • Barriers and facilitators experienced • “Can they understand it?” 	<ul style="list-style-type: none"> • Determine needs emerging from barriers to self-care • Determine needs emerging from barriers to understanding 	<ul style="list-style-type: none"> • Referrals to assess barriers • Referrals to address barriers

Referrals to assess barriers

Physicians make referrals based on assessments that are critical to supporting patients in addressing barriers to self-care. One physician describes how she refers

patients to other members on her care delivery team to determine barriers to self-care, “...I would refer them ... either my nurse for case management or ... to the pharmacist ... who really helps us a lot with our ... patients ... they’ll basically have a ½ hour phone call with them every other week ... [to] find out how they’re doing, what barriers they have towards taking medications and things” (P07, Internal Medicine). An internal medicine physician (P07) also describes how she refers patients to counseling staff to try to identify, or confirm, barriers to care; “for me often times it’s trying to identify a resource that I’ve got at the health center. Be it either a social worker, because the patient’s having a problem with access to medications, or one of the behavior health staff who can do some counseling, all the way up to getting them into see a mental health professional like a psychiatrist. So, it’s trying to make a ... fairly quick assessment about what’s going on.”

Physicians also make referral decisions based on the patient’s level of health literacy. These referral decisions are typically *within the care team*. They refer patients with low health literacy to help assess their level of health literacy and to determine whether a patients with low health literacy needs additional education.

Referrals to address barriers

Referrals outside of the care team

One family medicine physician (P15) shares a specific patient case of a patient who was experiencing mental health issues, “getting him into counseling, talking about the depression, if we didn’t address this, his diabetes wasn’t gonna get any better.” One family medicine physician (P17) states how he refers patients with mental health issues; “if they are [depressed] ... we look at the behavioral part and sometimes patients who

are having very high blood sugar or A1c [is] still not getting controlled, I refer them out to BHC (Behavioral Health Consultants).”

Physicians may also refer patients to outside support services to help with financial barriers. Social workers can help address financial strain that poses barriers to care. An internal medicine physician (P07) discusses how she refers patients to social work based on financial barriers; *“I do refer patients for social work who tell me they’re not having enough money ... I, not infrequently, put a referral in for a social work to talk to them about ways to help them ... [find resources] in the community that might help them out.”*

Physicians may also refer patients outside the care team, directly to community-based resources when patients experience barriers to access healthy foods or places to exercise. These barriers are associated with a patient’s neighborhood and community setting. They may live in areas that do not permit ready access to foods or places to exercise, presenting barriers to self-care. A family medicine physician (P15) shares how she attempts to determine if lifestyle demands or financial barriers are causing certain dietary practices. If so, she will refer the patient to assistance:

I see people all the time, they’re eating off the dollar menu regularly, and so I sort of have a conversation about, what’s involved in that? Is it because they just really like fast food and they don’t really wanna change? Is it because it’s super convenient and they’re working 3 jobs ...? Is it the cost issue?... I would address those very differently.... if it’s really a cost issue, then I’m probably going to be bringing in social work and making sure, finding out, do they have food assistance, [if] they eligible for food assistance. [ensure they] know what other resources are available ... And I think it’s often multi-factorial, it’s not just one [psychosocial factor].

Referrals within the care team

Physicians may also enlist the support of other members of the care team to address low health literacy. Physicians may make global referrals to other care team members to address health literacy issues. For example, this internal medicine physician (P13) refers a patient to help them understand their treatment:

“[If a patient] has a low level of education, doesn't really seem to understand what's going on ... in terms of understanding his medications. I ask him, ‘What other medical problems do you have?’ He has no idea and he's got all these things documented in the chart from the previous visit. So, I might say, ‘This person probably has low health literacy. This is somebody that I need to have meet with our social worker, have our nurse case manager reach out to.’”

Physicians may also make referrals to other care team members to address health literacy surrounding more specific, rather than global, challenges. Self-monitoring and medication management are two of the more significant problems addressed with specific referrals. An internal medicine physician (P02) describes a representative patient case when he scheduled a nurse visit to help a patient with finger sticks, *“he [didn't] know how to ... stick his fingers... I [brought] him back [for] a nurse visit to teach him that.”*

Physicians may also refer patients to pharmacists to educate patients and provide resources to help them with medication self-care. A family medicine physician (P12) recounted how he referred patients on multiple medications to pharmacists to help identify barriers to medication self-care due to inadequate understanding of what was required, *“if they're on multiple medications, and I have concerns about adherence we would call our pharmacy ... our pharmacy was great, we had some PharmD's there who would do pill boxes for two to three weeks ... [they] would do their pill boxes for them, and then they would teach them.”* Additionally, a family medicine physician (P12) refers patients to other practitioners to provide patients with more detailed instructions on insulin, *“I [refer patients to] meet with the diabetic nurse ... to have her just go through*

some teaching ... to let [the patient] see what these needles look like, and let [the patient] practice with water. Just do it for a month. Not every day, just try a few [days], or have them inject insulin in a very low dose.”

5.7.5. Survey Findings – Influence on Clinical Decisions

I now detail the findings from the survey concerning the influence of psychosocial factors on clinical decisions. The survey findings are consistent with the interview findings concerning the influence of psychosocial factors on clinical decisions.

Target level of control is the decision most frequently influenced by psychosocial factors, as shown in Table 5.7.5.1. Next in frequency are *making recommendations*, followed by *making referrals*, and *medications decisions*. I isolate physician responses in the table. The differences in responses between physicians and non-physicians for *making recommendations* and *other decisions* are statistically significant, showing a difference based on health care practitioner role.

Table 5.7.5.1 – Frequency with which Decisions are Influenced by Psychosocial Factors

	Total (n = 157)	Primary Care Physicians (n = 33)	Nurse Practitioners & Diabetes Educators (n = 124)	p value
Target Level of Control	4.26 (.723) _a	4.07 (.781) _b	4.31 (.703) _c	.113
Making Recommendations	4.18 (.777) _d	3.83 (.879) _e	4.26 (.729)	.006
Making Referrals	4.13 (.830) _i	3.93 (.712) _j	4.17 (.808) _k	.219
Medications	4.09 (.722) _l	3.98 (.649)	4.12 (.743) _m	.345

Note. Respondents were asked to indicate the frequency that the decisions they make, or have input into, are influenced by psychosocial factors. Responses were captured in a Likert scale: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never. Standard deviations listed in parenthesis.

^a n=141. ^b n = 28. ^c n = 113. ^d n = 154. ^e n = 30. ^f n = 78. ^g n = 12. ^h n = 66. ⁱ n = 122. ^j n = 21. ^k n = 101. ^l n = 145. ^m n = 112.

Next, I highlight frequency with which psychosocial factors influence the specific clinical decisions within each of the four groups.

Target Level of Control Decisions

For target level of control decisions, psychosocial factors are most frequently considered in *incorporating input from the patient in setting the goal*, as shown in Table 5.7.5.2. Next is *establish target goal for blood glucose*. I isolate physician responses in the table. The differences in responses between physicians and non-physicians for making *incorporating input from the patient in setting the goal* are statistically significant.

Table 5.7.5.2 – Frequency with which Level of Control Decisions are Influenced by Psychosocial Factors

	Total (n = 141)	Primary Care Physicians (n = 28)	Nurse Practitioners & Diabetes Educators (n = 113)	p value
Incorporate Input from Patient in Setting Goal	4.51 (.780)	4.15 (.970)	4.60 (.701)	.024
Establish Target Goal for Blood Glucose	4.21 (.827) ^a	4.07 (.900)	4.24 (.808) ^b	.333
Establish Target Goal for HbA1c	4.15 (.913) ^c	4.25 (.887)	4.13 (.921) ^b	.519
Other Target Goal Decisions	4.15 (.950) ^d	3.82 (1.328) ^e	4.21 (.861) ^f	.365

Note. Respondents were asked to indicate the frequency that the level of control decisions they make, or have input into, are influenced by psychosocial factors. Responses were captured in a Likert scale: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never. Standard deviations listed in parenthesis. ^a n=140. ^b n = 112. ^c n = 140. ^d n = 68. ^e n = 11. ^f n = 57.

Making Recommendations Decisions

For making recommendations decisions, psychosocial factors are most frequently considered for *dietary recommendations*, as shown in Table 5.7.5.3. *Making physical activity recommendations* and *recommending that the patient’s caregivers understand what is required of the patient* are next. *Frequency of clinical visits* and *other*

recommendations decisions are least frequently indicated as influencers. I isolate physician responses in the table. I found statistically significant differences between physicians and non-physicians in responses for making *dietary recommendations*, making *physical activity recommendations*, and *other recommendations*.

Table 5.7.5.3 – Frequency with which Recommendations Decisions are Influenced by Psychosocial Factors

	Total (n = 154)	Primary Care Physicians (n = 30)	Nurse Practitioners & Diabetes Educators (n = 124)	p value
Make Dietary Recommendations	4.31 (.843)	3.90 (.995)	4.40 (.775)	.003
Make Physical Activity Recommendations	4.18 (.961) _a	3.66 (1.143) _b	4.30 (.874)	.007
Recommend Patient’s Caregivers Understand What Is Required of Patient	4.17 (.961) _c	4.10 (.900) _d	4.19 (.978) _e	.675
Frequency of Clinical Visits	4.12 (.912) _f	3.87 (.937)	4.18 (.898) _g	.089
Other Recommendations Decisions	4.12 (.909) _h	3.60 (.966) _i	4.24 (.860) _j	.043

Note. Respondents were asked to indicate the frequency that the recommendations decisions they make, or have input into, are influenced by psychosocial factors. Responses were captured in a Likert scale: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never. Standard deviations listed in parenthesis.

^a n=153. ^b n = 29. ^c n = 152. ^d n = 29. ^e n = 123. ^f n = 150. ^g n = 120. ^h n = 51. ⁱ n = 10. ^j n = 41.

Referrals Decisions

For making referrals decisions, psychosocial factors are most frequently considered in *making referrals to a dietician and/or nutritional information*, as shown in Table 5.7.5.4. I isolate physician responses in the table. None of the differences in responses between physicians and non-physicians is statistically significant.

Table 5.7.5.4 – Frequency with which Referrals Decisions are Influenced by Psychosocial Factors

	Total (<i>n</i> = 122)	Primary Care Physicians (<i>n</i> = 21)	Nurse Practitioners & Diabetes Educators (<i>n</i> = 101)	<i>p</i> value
Refer to Dietitian / Nutritional Information	4.26 (.980) ^a	4.00 (.775)	4.32 (1.016) ^b	.122
Refer to Support Services Within the Organization	4.20 (.967) ^c	4.05 (.970) ^d	4.22 (.969) ^e	.481
Refer to Diabetes Education	4.18 (1.024) ^f	3.90 (.889) ^g	4.24 (1.047) ^h	.181
Refer to Support Services Outside the Organization	4.11 (1.027) ⁱ	3.95 (.805) ^j	4.14 (1.069) ^k	.365
Refer to Specialty Care	4.07 (.873)	3.86 (.727)	4.11 (.898)	.229
Other Referral Decision(s)	4.03 (1.025) ^l	3.43 (.976) ^m	4.15 (1.00) ⁿ	.090

Note. Respondents were asked to indicate the frequency that the referral decisions they make, or have input into, are influenced by psychosocial factors. Responses were captured in a Likert scale:

5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never. Standard deviations listed in parenthesis.

^a *n*=113. ^b *n* = 92. ^c *n* = 117. ^d *n* = 19. ^e *n* = 98. ^f *n* = 114. ^g *n* = 21. ^h *n* = 93. ⁱ *n* = 120. ^j *n* = 21. ^k *n* = 99.

^l *n* = 40. ^m *n* = 7. ⁿ *n* = 33.

Medications Decisions

For medications decisions, psychosocial factors are most frequently considered in *selecting a specific medication*, as shown in Table 5.7.5.5. I isolate physician responses in the table. None of the differences between physicians and non-physicians for the specific medication decisions listed are statistically significant.

Table 5.7.5.5 – Frequency with which Medications Decisions are Influenced by Psychosocial Factors

	Total (n = 145)	Primary Care Physicians (n = 33)	Nurse Practitioners & Diabetes Educators (n = 112)	p value
Select a Specific Medication	4.34 (.680)	4.21 (.600)	4.38 (.701)	.173
Start a Patient on Non-Insulin Injectable Diabetes Medication	4.27 (.862) _a	4.30 (.728)	4.26 (.908) _b	.798
Reduce Complexity of the Medication Regimen	4.26 (.822) _c	4.09 (.843)	4.31 (.812) _d	.174
Select a brand, or a Generic, Medication	4.23 (.870) _e	4.36 (.699)	4.18 (.919) _f	.300
Start a Patient on Injectable Insulin	4.21 (.862) _g	3.97 (.695) _h	4.28 (.897) _i	.075
Adjust Non-Insulin Injectable Diabetes Medication	4.03 (.987) _j	3.85 (.972)	4.01 (.989) _k	.213
Add an Additional Oral Diabetes Medication	4.01 (.936) _l	4.03 (.948) _m	4.00 (.936) _n	.868
Adjust Insulin Injectable Diabetes Medication	3.96 (1.084) _r	3.61 (1.298)	4.07 (.988) _s	.067
Start a Patient on 1st Oral Diabetes Medication	3.92 (1.079) _t	3.81 (1.091) _u	3.95 (1.078) _v	.536
Adjust Oral Diabetes Medication Dosage	3.87 (1.033) _w	3.82 (1.074)	3.89 (1.024) _x	.722

Note. Respondents were asked to indicate the frequency that the medications decisions they make, or have input into, are influenced by psychosocial factors. Responses were captured in a Likert scale: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never. Standard deviations listed in parenthesis.

^a n = 126. ^b n = 93. ^c n = 138. ^d n = 105. ^e n = 132. ^f n = 99. ^g n = 136. ^h n = 32. ⁱ n = 104. ^j n = 124. ^k n = 91. ^l n = 130. ^m n = 31. ⁿ n = 99. ^o n = 53. ^p n = 10. ^q n = 104. ^r n = 137. ^s n = 104. ^t n = 130. ^u n = 32. ^v n = 98. ^w n = 135. ^x n = 102.

Practitioner Characteristics’ Association with Psychosocial Information Use

Nurse practitioners, registered nurses, and diabetes educators indicate that each of the four groups of clinical decisions are associated with psychosocial factors more frequently than physicians indicate their influence. The difference is statistically significant only for medications decisions. I found no statistical significance when comparing experienced practitioners (>=10 years of experience) to less experienced practitioners (<10 years of experience). Also, I found no statistically significant

difference in associations of psychosocial factors when comparing family medicine physicians to internal medicine physicians.

Clinical Decisions Influenced by Psychosocial Factors and Years of Experience

I also tested differences between frequency that psychosocial factors influenced the four groups of clinical decisions, and years of experience. Years of experience is my independent variable and each of the four groups of decisions is my dependent variable. I measured the independent variable based on if the respondent had less than ten years of experience, or greater than or equal to ten years of experience. I used the one-way ANOVA to investigate difference. I found no statistically significant difference between years of experience and importance of psychosocial factors for any of the four groups of decisions (Recommendations: $F(1,152) = 3.34, p > .05$; Medications: $F(1,143) = .051, p > .05$; Target Level of Control: $F(1,139) = 1.085, p > .05$; Referrals: $F(1,120) = 3.324, p > .05$). The more experienced respondents did see three of the four groups of decisions as more important: recommendations (4.25 versus 4.00), target level of control (4.30 versus 4.17), and referrals (4.22 versus 3.91). Medications decisions are the only group for which the more experienced respondents indicated lessor importance (4.08) than less experienced respondents (4.11).

Clinical Decisions Influenced by Psychosocial Factors and Physician Specialty (Internal Medicine and Family Medicine)

Last, I tested differences between frequency that psychosocial factors influenced the four groups of clinical decisions, and physician specialty. The sample for this test was only the physician sub-sample (n=36). Specialty is my independent variable and each of the four groups of decisions is my dependent variable. The primary care physicians were comprised of two specialties: family medicine and internal medicine. I used the one-way

ANOVA to investigate potential differences. I found no statistically significant difference between specialty and importance of psychosocial factors for any of the four groups (Recommendations: $F(1,28) = .641, p > .05$; Medications: $F(1,31) = .300, p > .05$; Target Level of Control: $F(1,26) = .952, p > .05$; Referrals: $F(1,19) = .897, p > .05$).

5.8. Conclusion

In this chapter, I described how practitioners *use* psychosocial information in the course of making, or providing input into, type 2 diabetes care clinical decisions in the outpatient setting. I introduced a cognitive map to describe the process of *when* and *how* psychosocial factors influence clinical care decisions (see Figure 5.2). The cognitive map is a visual representation of the key concepts of the cognitive process of psychosocial information use. The four key concepts I described in the cognitive map are: 1) considering clinical practice guidelines, 2) building and maintaining rapport with patients, 3) triggers of psychosocial information consideration, 4) assessing the patient, and 5) making the clinical decision.

Physicians are generally aware of the clinical practice guidelines but they readily use clinical judgment to weigh the guidelines against the specific patient situation, which is influenced by psychosocial factors. I describe how establishing an appropriate HbA1c goal is the guideline most influenced by psychosocial factors. Physicians establish an HbA1c goal above the guideline depending on financial strain, level of social support, or patient preferences.

I described the substantial importance physicians place on establishing and maintaining a patient-doctor relationship characterized by trust. This is necessary to grant the physicians access to use psychosocial information to inform clinical decisions. I

described the methods they use to build the relationship, such as asking open-ended questions, maintaining a safe environment without judgment, and empowering patients.

I outlined how psychosocial factors influence the specific four types of diabetes care clinical decisions. Physicians use psychosocial information to inform decisions that consider the patient's circumstances which are driven by psychosocial factors such as level of social support and financial strain.

I also showed the survey results on the influence of psychosocial factors on each of the four types of clinical decisions, which included tests for association. I only found statistically significant differences between practitioner role and frequency of influence for *making recommendations* decisions. Nurse practitioners and diabetes educators indicated that psychosocial factors influenced *making recommendations* more so than the physicians indicated influence. I also examined the relationship between clinical decisions, years of experience, and physician specialty. I did not find statistically significant difference between years of experience and importance of psychosocial factors for any of the four types of clinical decisions. Last, I found no statistically significant difference between physician specialty and importance of psychosocial factors for any of the four types of clinical decisions.

In the next chapter, I describe barriers to use of psychosocial information. I describe how practitioners use EHR tools to document and retrieve psychosocial information. I detail their confidence in using the EHR tools for psychosocial information use, and frequency that these tools support the documentation and retrieval of psychosocial information.

CHAPTER 6

BARRIERS AND FACILITATORS TO USE OF PSYCHOSOCIAL INFORMATION

Discrete fields in an EHR fail to capture critical clinical information which would be captured in narrative....over-reliance on structured data capture risks information loss, degrading value of the clinical record.

Structured data capture can be at odds with the expressivity, workflow, and usability factors preferred by clinicians.

EHR systems often do not meet the needs of users, supporting downstream reporting requirements at the expense of “clinically useful information”.

— HIMSS Health Story Project, November 2013

6.1. Introduction

In this chapter, I describe barriers and facilitators to use of psychosocial information. I touch upon other sources of psychosocial information, however I focus on practitioners' experience with electronic health record (EHR) tools to document and retrieve psychosocial information in the course of providing diabetes care, specifically in making, or providing input into, type 2 diabetes (T2DM) care decisions in the outpatient setting. In this chapter, I answer my sixth research question:

RQ6: What are the barriers and facilitators to acquiring and using psychosocial information? How effectively do current tools (templates, data fields, free text) support the storage and retrieval of psychosocial information?

In answering this research question, I further develop the conceptual model of psychosocial information access, initially depicted in chapter four (see Figure 4.3). I

include the additional psychosocial information physicians expressed was needed to help inform clinical decisions, and ideas physicians offered to improve the documentation and potential use of psychosocial information.

6.2. Facilitators to Use

As described previously, the patient is a primary source of psychosocial information. Physicians indicated that the quality of the relationship grants them access to sensitive psychosocial information. I examined physician perceptions of the level of accuracy of the psychosocial information that they received from patients. Physicians also use the medical record to access and use psychosocial information to inform care decisions. For instance, EHR alerts can prompt a referral to support services, and physicians document psychosocial information that can serve as a reminder to them in subsequent visits concerning a patient's circumstances.

6.2.1. EHR Can Facilitate Use

Physicians use the EHR to access psychosocial information to help inform clinical care decisions. EHR systems incorporate alerts regarding psychosocial information that can trigger a referral decision and in turn, help facilitate communication across the care team. One internal medicine physician (P07) states how the EHR provides her with intake information for new patients and alerts, which she can use to refer a patient to support services; *“all intakes get questions about fear of becoming homeless ... that’s an automatic flag in our system ... we will refer them to Social Work to get them early intervention ... it’s a great system.”*

Additionally, notes from referrals to other types of practitioners can bring attention to psychosocial issues within the consultation. As P07 said, *“If Mental Health*

sees them ... I make it a point to read the mental health note ... to make sure there's nothing in there that I need to know about because I know it will affect their medical care."

The social history portion of the EHR may also trigger consideration of psychosocial issues. A family medicine physician (P01) describes how psychosocial information documented in social history helps physicians understand a patient's situation; *"part of a doc's social history [is] trying to figure out who's at home. What sort of contacts there are? What impacts those contacts are making on people? So for me, it's important to know where they're working, who they're living with, who's important to them.... It is [captured in the social history]."*

Finally, information contained in free text notes may trigger consideration of psychosocial issues. A family medicine physician (P14) describes how she uses the EHR to document portions of the patient's circumstances, the patient's "story," that serve as prompts in future consultations. This information is documented during the consultation, in pithy phrases. These help remind physicians of what may have been discussed during the clinical visit; *"it's paraphrased because they'll be telling me a story ... about depression, the drinking ... their relationships, their home environment ... and I don't need to put the whole story in ... I just need a little tickler to remember. I look at it and I'll be like 'Ah! Yes, I remember!' It just comes flowing back, just the entire visit just comes back ... I will never remember if I don't type it right then."*

Physicians may rely on their memory if retrieving psychosocial information in the EHR is difficult, or if the needed information may not be there. As this physician said, *"A lot of things aren't in the chart and certainly, there's a place where you can put notes."*

And you can put a note like, 'Patient's son recently committed suicide.' And you can put that in there kind of like in the family section. But I know I don't routinely check that section. I don't think other people do either" (P15, Family Medicine). In such cases, memory embedded within a long relationship with a patient may be sufficient from a physicians' perspective. Additionally, this information can be augmented at times with confirmation from the patient during a visit; *"I know my patients really well, so most of that [psychosocial information] I'm actually ... relying what's on my head ... if I vaguely remember something, I'll ask again ... to verify what I remember, or clarify"* (P08, Internal Medicine).

6.2.2. Survey Results

For the psychosocial information, respondents indicated as "Very Important" or "Important" in making, or providing input into, clinical decisions, I asked them to indicate all sources for this information. Respondents could indicate more than one source. I gave respondents six choices: 1) patient, 2) family/caregiver, 3) other providers, 4) EHR, 5) other, and 6) no reliable source.

Survey respondents are most confident in the accuracy of psychosocial information accessed from the *patient, via consultation or interview*. As shown in Table 6.2.2, respondents are next most confident in the accuracy of information from the *other providers or members of the care team*. Next in confidence in accuracy is *family and/or caregivers*. The *patient, via screening tools and/or forms* is equal to *EHR*. I isolate physician responses in the table. None of the differences in responses among the three sources is statistically significant.

Table 6.2.2 – Confidence in Accuracy of Psychosocial Information

	Total (<i>n</i> = 159)	Primary Care Physicians (<i>n</i> = 34)	Nurse Practitioners & Diabetes Educators (<i>n</i> = 125)	<i>p</i> value
Patient, via consultation or interview	4.16 (.635)	4.15 (.558)	4.17 (.657)	.865
Other Providers or Members of the Care Team	4.09 (.688)	3.91 (.712)	4.14 (.676)	.092
Family / Caregivers	4.00 (.563)	4.06 (.600)	3.98 (.553)	.493
Patient, via screening Tool or Forms	3.86 (.651)	3.85 (.500)	3.86 (.688)	.930
EHR	3.86 (.757) ^a	3.82 (.717)	3.87 (.771) ^b	.759

Note. Respondents were asked to indicate the frequency that they had confidence in the accuracy of psychosocial information they accessed from these sources. Responses were captured in a Likert scale: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never. Standard deviations listed in parenthesis. ^a *n*=156. ^b *n* = 122.

6.3. Barriers to Use

Although the EHR can facilitate use of psychosocial information, physicians encounter considerable barriers in their efforts to utilize the EHR to use psychosocial information for clinical decisions. Barriers include practice constraints (i.e., time necessary to document and retrieve psychosocial information), and concerns about consistency across the care team.

6.3.1. Clinical Practice Constraints

Interview participants described circumstances that present barriers to using psychosocial information to help inform diabetes clinical care decisions. I grouped them according to clinical practice constraints and additional psychosocial information desired. Physicians describe how the very nature of clinical practice in the primary care setting presents barriers to access psychosocial information. Time constraints limit their ability

to probe psychosocial information. Also, learning about psychosocial barriers after patients' self-care has been negatively affected by them is an impediment to use.

Time Constraints

Given that the patient is the most frequent source of psychosocial information, it is perhaps unsurprising that interview participants consistently express the view that time constraints are a major factor in their ability to access pertinent psychosocial information; *“in my opinion, that’s the biggest problem, that we as a primary care physicians never have that much time, to ... discuss [psychosocial information] with the patient”* (P17, Family Medicine). Although physicians feel they have the skill to probe on psychosocial issues, time is a barrier to getting this information from the patient; *“The reality of it [...] is the providers do not have the time. A lot of ... question[s] [investigating barriers to self-care] could go on forever”* (P02, Internal Medicine). A family medicine physician (P10) shares how she does not have the time to probe to assess health literacy in order to explore potential barriers to self-care based on the patient's comprehension of the diabetes regimen; *“I think I’m always feeling pressed for time. Of course that’s like a complaint across the board. It’s like, ‘Where do you fit that in?’”* A family medicine physician (P06) expresses how time constraints restrict her ability to discuss pertinent psychosocial information that could offer her important insights on barriers to self-care; *“lack of time ... that’s an issue. There’s just less time to talk about things that maybe, I could say, are specifically related to at least diet, exercise, and medication intake ... they are related to barriers for diabetes care.”* Another family medicine physician (P10) expresses frustration with not having the time to fully understand the patient's circumstances and must prioritize how she spends her consultation time; *“Get[ing] ...*

people's back story ... is great, but it's hard to do that and stay focused on your visit. So I don't always tend to [get the back story] ... I do focus more on the medical piece ... even though ... it's important to focus on the back story of where the patient's coming from, but it's hard to do all that."

Physicians share specifics of the clinical consultation and how much time they have to actually discuss potential psychosocial issues with their patients. One family medicine physician (P06) discusses how she must allocate the limited time of the consultation; *"generally there are too many other problems to talk about. And there's limited time, just a 15-minute visit, which is like 5 minutes of discussion, 5 minutes of exam. And then the last 5 minutes are like getting in, getting out, and then going to lab."* An internal medicine physician (P03) points out that diabetes care is only a *portion* of a primary care clinical visit, which is already time constrained, even with extra time commonly allocated for a new patient visit; *"if it's a new patient, you get 10 minutes face-time, right? If it's ... a[n] established patient, 5 minutes.... So, 10 minutes ... for addressing everything, including health maintenance ... it's really too short.... So diabetes gets what, 30 seconds?"*

Some physicians share how they are not incentivized to allocate their limited time during the clinical consultation to probe and capture psychosocial information. Incentive structures influence how they spend time with patients, and what they focus on *"I'm not rewarded based on the detail of the note but ... that it meets certain coding requirements ... [and] that they're done on time"* (P08, Internal Medicine). An internal medicine physician (P13) shares his perspectives on how performance measures may influence how he allocates time with patients:

Many of the current metrics [incent physicians] to spend more time with a person who has a (HbA1c) 9.2 than the person who has a like the 8.7 or 8.5 that really we should be trying to aggressively get to 7.... maybe I really should spend more time with that person who has the A1c of 8.5 ... tapping into some of the psychosocial stuff ... to figure this out and really help them and understand what the barriers are and help them get to where they need to be.

6.3.2. Concerns about Consistency Across the Care Team

Physicians express concerns about variation between care team members in how they document psychosocial information. Uncertainty surrounding how psychosocial information is documented causes physicians to speculate if their documentation is useful to other members of the care team. A family medicine physician (P15) questions if other physicians follow the same procedure she does in documenting psychosocial information she deems important; *“you can write ... the psychosocial things that you think would be helpful for somebody to know ... ‘Patient like has a severe history of abuse’ ... I think that kind of thing, we will put in the problem list ... I don’t know if everybody does, but I will put it there.”*

Because of this uncertainty and variation in use, physicians question the value of taking time to search the record for pertinent psychosocial information, as what they are seeking may not be there. Rather than checking the record, they choose to get information from the patient; *“it’s easier to just ask the patient [about ability to pay for medications], than it is to dig through someone else’s notes that may or may not have documented that”* (P08, Internal Medicine). Additionally, physicians note that psychosocial information that they document in the record may be overlooked by other practitioners who provide care to the same patient. For example, an internal medicine physician (P08) expressed frustration with *important* psychosocial information she documented in the record which

was missed by her partners at her clinic and those who provided care to the patient during a hospital stay:

Sometimes [I'll] type in some comments ... under the unstructured problem list or under past medical history ... or in the social history. But by and large, a lot of that will get lost.... I know that from experience because if my patients go to the hospital or get seen by my partners in clinic, there might've been something really important that I knew about them and their psychosocial situation and that I documented using this pretext that didn't get picked up by my partners when they were taking care of the patient ... that's probably the biggest thing, there's always the risk that what I documented didn't click with them [i.e., partners on care team] ... what I meant in the social history.

6.3.3. Questions Regarding Accuracy of Psychosocial Information Accessed

I examined the perceived accuracy of information because it is an important dimension of access. All study participants indicate fairly high levels of trust in the accuracy of psychosocial information that they access as they make, or influence, clinical decisions for diabetes patients. On an unprompted basis, physician interviewees expressed the concern that, at times, they may question the accuracy of the psychosocial information that patients provide. An internal medicine physician (P02) with twenty years of experience, explains his scrutiny of psychosocial-related information this way, *"I'll be honest with you ... most of the time, a lot of patients, I have a feeling, I can't validate it, but my own intuition is, sometimes they tell us what we wanna hear.... [when] they disclose to me that they are compliant and have all ... "yes's" to what I'm asking. That's when I start to be dubious at something ... they're not being upfront."* Physicians may also evaluate the information they receive from clinical tests against their experience with some patients who attempt to skew results of common diabetes clinical measures, like fasting blood sugar (FBS). A family medicine physician (P12) with over thirty years of experience shares, *"people study for tests as I always say. So they know they're gonna*

get their fasting blood sugar checked, they'll starve themselves for 3 days and say, 'My sugar's fine.' And then they're so starved they'll go out and their sugar will be 500, and they'll be in comatose by the time they get home."

There are risks associated with accessing social support information from family and caregivers. Gleaning level of support can be delicate if the family member(s) are present during the clinical visit. An internal medicine physician (P11) describes situations in which it may be difficult to get information:

Family support is not very easy to find out. That's the toughest ... I've seen patients ... The son is here [points to the left], the mother is here [points to the right] ... You can literally see them arguing right in front of you. If [they] say, "Okay, my mom doesn't support me," and the mom is like next to [them] ... I think, that's one thing which is difficult to get out. It's difficult to get out of a patient ... family support.

Health Literacy - Problems with Access

Physicians describe barriers to accessing accurate information about health literacy. Low health literacy can influence the accuracy of the information the patient is asked to provide; *"I think both in terms of health literacy and just literacy, in general ... there's a lot of paperwork that patients ... fill out ... I think that is ... a definite gap, both in terms of my own screening, and just in terms of things that we're not doing as well as we could do"* (P15, Family Medicine). Another family medicine physician (P16) explains that lack of access is because disclosing low literacy may be too personal, compared to other personal information patients are comfortable sharing; *"I have a fair number of conversations with people about domestic violence, about rape, about things like that ... weird sexual practices, multiple sexual partners ... that people are very open about ... I've never had a conversation like that about literacy."*

Health Literacy - Problems with Assessment

Although level of health literacy is an important psychosocial factor, it is difficult to assess. A family medicine physician (P10) describes challenges to assessing literacy; *“we don’t always do a really good job about finding out who can’t read and write ... it is kind of hidden, you have to kind of tease it apart ... you end up giving them handouts and things to write on ... it kind of miss[es] the mark ... we don’t really assess patients’ literacy really well.... We don’t have in a formal way of assessing it. So that’s [a] limitation.”* This assessment gap was echoed by other physicians, *“[we] don’t have a good handle on health literacy, how much they understand”* (P02, Internal Medicine). Another family medicine physician (P15) revealed that her assessment of a patient’s health literacy may be higher than it actually is, *“I’m probably not as good... I mean ... I wish I were better about screening for [health literacy] ... particularly, because when you read things about health literacy, it’s often a lot lower than I think it is.”*

Physicians describe various techniques they use to attempt to assess health literacy level, which they associate with level of education and more general literacy.

One family medicine physician (P06) describes his approach:

I [have] never used a screening tool for health literacy, there are some that are available, but I would generally gauge it by patients.... I would have them look at the bottles with me and I’d say, ‘So this bottle says taking twice a day... two tablets twice a day’... [assessing] literacy for me was more around their bottles and what can they tell me [about] the information on the bottle.

A family medicine physician (P10) describes the complexity of trying to assess this important psychosocial factor:

A lot of times, it is kind of hidden [level of health literacy] ... you have to kind of tease it apart ... and we don’t always do a really good job about finding out who can’t read and write... You end up giving them handouts and things to write on, and it [can] kind of miss the mark.” She continues with doubts about her care

team's ability to assess health literacy, *"we don't really assess patient's literacy really well... I don't know ... we don't have a formal way of assessing it. So that's a limitation ... we're not necessarily always doing a great job with the health literacy."* (P10, Family Medicine)

6.3.4. EHR Presents Barriers to Use

Physicians share various barriers they experience to using specific EHR tools (i.e., data fields, templates, and free text) to document and retrieve psychosocial information. I arrange these EHR barriers in two areas: 1) time required to document psychosocial information and 2) the design of current tools.

Time Required to Document Psychosocial Information

Psychosocial information may be discussed at various times over the course of the clinical consultation, but it may not be documented in the medical record due to the time it takes to enter psychosocial information. Therefore, physicians may not use the EHR tools to document it. A family medicine physician (P12) discusses experiences across different care teams; *"Not everybody, myself included, would always include a very robust social history in writing. It just took too much time."* An internal medicine physician (P08) cites time as a barrier to documenting more extensive psychosocial information on the patient's "story", which includes pertinent information such as barriers to following the recommended diabetes regimen, *"Because of time, sometimes typing really fast it might be something like, 'DM discussed difficulties with lifestyle,' and that may be all I say, and I may know a 10 minute story about that but I didn't put it in [the EHR]."* Physicians describe having to choose between spending time with their patients and documenting psychosocial information in the record. They choose to spend their limited time talking to their patients, rather than documenting information in the

record; “it takes a lot of time ... it’s so time-consuming [to capture psychosocial information in free text] that I’d rather talk to my patient for the vast majority of the time and then spend a minimal time writing about what we spoke about, and then go on to my next patient where I spend time talking to them” (P15, Family Medicine).

Concerns about How the Information will be Used

Physicians also may not document self-care behavior because of concerns that their notes may be interpreted inaccurately by other practitioners or may result in stigmatization of patients. Therefore, as this physician explains, they may be reluctant to document this information in the EHR:

[a patient] may ... have a history of noncompliance but I don’t usually ... write the reason in the chart. I don’t know.... We tend not to put ... in the chart ... things that might implicate the patient. (P15, Family Medicine)

Design of EHR Tools

Participants also highlight the belief that the design of specific EHR tools — data fields, templates and free text — presents barriers to both documenting and retrieving psychosocial information. Some psychosocial information physicians express influences clinical care decisions, such as level of social support and financial strain, is not in the record. Physicians do not believe these tools facilitate easy documentation, or use, of relevant psychosocial information.

Documentation

EHR tools do not enable easy documentation of psychosocial information at the specificity required. The tools can be too complex and layered. A family medicine physician (P16) describes the difficulty in documenting rationale for a target goal for HbA1c, which can be driven by psychosocial factors not documented in the record:

I don't think it's as explicit as we'd like it to be ... ideal would be ... some place in the chart where we said this patient's A1c goal is 8 or 9 and ... clarifying ... the reason that we're not doing tight control.... It may be at the end of a note, but it's not some place that's easy to find.... I'm not even sure ... that I do it the way that I think would be ideal.

Current tools do not enable physicians to document specific psychosocial information pertinent for diabetes care decisions. An internal medicine physician (P08) describes the limitation of data fields:

The structured fields that we have are things like marital status and education level, which are important, but it's actually not as important, because health literacy and literacy are 2 different things that can't be predicted, unfortunately, by college education.... [Also] there [is not] ... a way to specifically document what their goals of treatments are, what their self-perceived barriers are.

A family medicine physician (P06) describes the limitations on what types of psychosocial information the data fields can document. For example, level of social support is not captured. This is highly pertinent psychosocial information for clinical decisions:

There is no tab for social support in the medical record ... I see the diabetes hypertension, hypercholesterolemia, back pain, abdominal pain. I see symptoms, and I see diagnoses, but I don't see psychosocial issues ... there are tabs for notes and problem list and medications and orders, but there's no tab for psychosocial issues.

An internal medicine physician (P09) discusses further limitations in data fields for documenting specific psychosocial information; “*you can code for ... narcotic addiction or tobacco, nicotine addiction, but there's not one for poverty or economic, food insecurity or shelter insecurity. So we missed the boat.*”

Templates are also not designed to capture the specific psychosocial information that may be pertinent to making clinical decisions. The structured format of templates do not lend themselves to capturing information concerning the patient's background and

living situation. A family medicine physician (P16) describes how the templates do not enable practitioners to capture the patient's story sufficiently:

Epic [EHR] has a big section for social stuff. But it's not all that usable. I don't quite know why it doesn't work, but it doesn't work ... nobody uses it ... [Because] psychosocial history is very story oriented, it's not very checkbox oriented.

Psychosocial information documented in free text fields may be difficult to use, because it is not documented in phrases that provide insight, or is difficult to locate within the text. This is especially the case when other members of the care team may have documented it; *“somebody else might find that it's [i.e., the psychosocial information] cryptic or it's very broad. It doesn't actually give the granular detail or it's simply not in a place they can find [it] ... and if they did, it's a note, it's a phrase”* (P08, Internal Medicine).

Retrieval/Use

Physicians express considerable challenges to retrieving and using psychosocial information based on capabilities of EHR tools, specifically that which is contained in data fields and templates. A family medicine physician (P15) describes difficulty in retrieving psychosocial information concerning mental health status; *“there's no place in MyChart [EHR] where I can find out what somebody's PHQ-9 was (Patient Health Questionnaire - a diagnostic tool for mental health).”* To address the limitations of these current tools, physicians simply depend on other means to use psychosocial information. Since the current capabilities of data fields are inadequate, physicians may rely on their memory to retrieve and then use psychosocial information; *“with some of my patients ... [I'm] worried about nutrition ... Unfortunately there's no great way to actually capture that in the EMR so a lot of it goes into unstructured fields in the HPI (History of Present*

Illness). Or it [was] buried 3 years ago ... [in] a progress note, that's not very helpful ... it's more in my head than it is in an accessible way in the chart" (P08, Internal Medicine).

Templates are difficult to use for retrieving specific psychosocial information. They are not designed for use with the broad range of relevant psychosocial information physicians may deem relevant to inform clinical decisions. In addition, their design is characterized by several layers to access. A family medicine physician (P12) describes how difficult it can be to retrieve relevant psychosocial information; *"Sometimes it [isn't] all that easy to find where ... [psychosocial information] ... is captured ... If their daughter's involved in their care or ... who's the primary caretaker?... The way they are designed ... complex ... the templates [are] oftentimes ... buried under multiple layers."*

6.3.5. Availability of Psychosocial Information to Support Clinical Decisions

In this section, I outline the availability of psychosocial information. I describe how it can be difficult to evaluate financial barriers to self-care. I describe survey findings concerning the frequency that respondents have the information they need.

Financial barriers

Financial barriers can be difficult for physicians to ascertain. Simply knowing income level or payer status may not be sufficient to inform a clinical decision. Ability to pay for medications is a more precise financial barrier that physicians deem important. An internal medicine physician (P07) with over a decade of experience based in Michigan, states, "I don't necessarily [use] income as much as ... the patient's ability to pay for their medications."

Availability of Psychosocial Information

Although respondents indicate that they frequently use psychosocial information for clinical care decisions, it is frequently unavailable. As shown in Table 6.3.5 psychosocial information is most frequently available for *medications* decisions. Respondents indicated 3.7 out of a 5 point Likert scale (5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never). Also, 59.0% of responses indicated “Always” or “Often”. *Making recommendations* decisions are next (3.69/5; 58.9%). *Other decisions* are next (3.67/5; 67.3%). *Target level of control* decisions are next (3.63/5; 54.8%), followed by *making referrals* (3.62/5; 54.9%). I isolate physician responses in the table. None of the differences in responses are statistically significant.

Table 6.3.5 – Frequency with which Respondents Have the Psychosocial Information They Need

	Total (n = 168)	Primary Care Physicians (n = 39)	Nurse Practitioners & Diabetes Educators (n = 129)	p value
Medications	3.70 (.765) ^a	3.82 (.756)	3.66 (.767) ^b	.267
Making Recommendations	3.69 (.700)	3.79 (.801)	3.66 (.667)	.289
Other Decisions	3.67 (.923) ^c	3.50 (1.000) ^d	3.73 (.905) ^e	.464
Target Level of Control	3.63 (.734) ^f	3.74 (.910)	3.59 (.671) ^g	.335
Making Referrals	3.62 (.704) ^h	3.72 (.759)	3.58 (.686) ⁱ	.301

Note. Respondents were asked to indicate how often they had the psychosocial information they need when making, or providing input into, clinical decisions. Responses were captured in a Likert scale: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never. Standard deviations listed in parenthesis.

^a n=161. ^b n = 122. ^c n = 52. ^d n = 40. ^e n = 122. ^f n = 166. ^g n = 127. ^h n = 164. ⁱ n = 125.

Timing of Access to Psychosocial Information

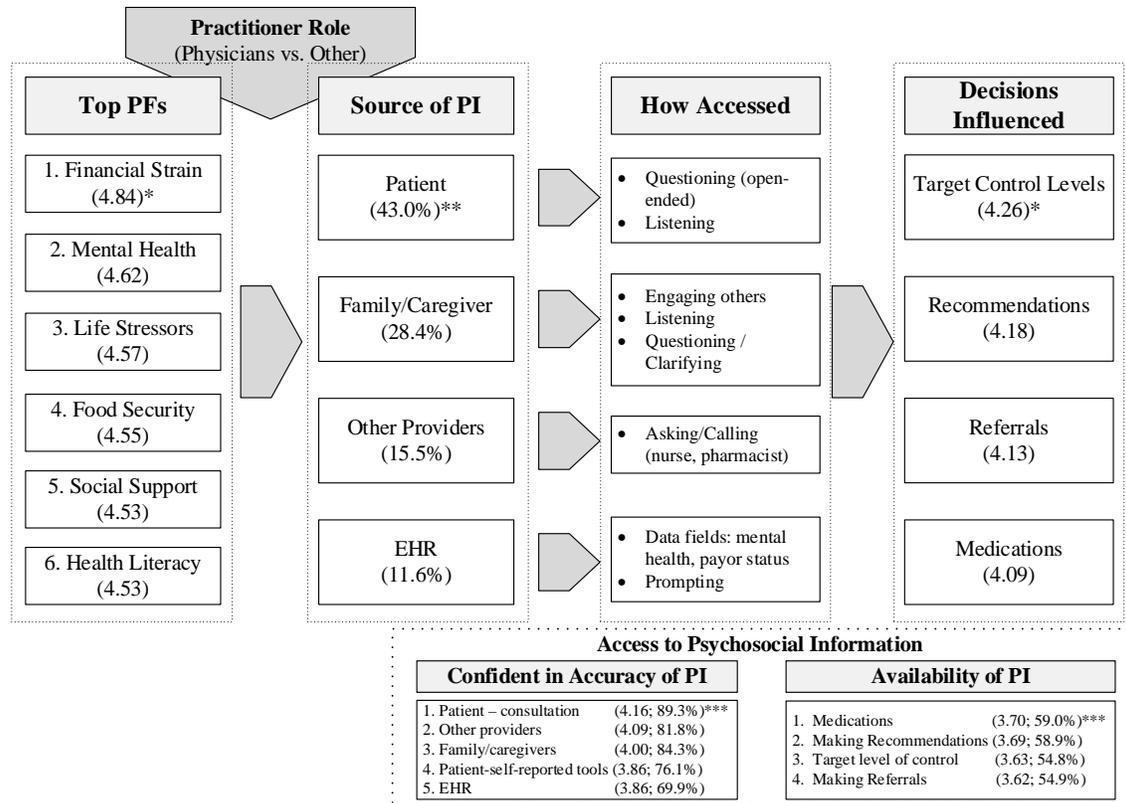
Physicians describe *when* psychosocial information is disclosed is also a barrier to incorporating psychosocial factors into clinical decisions. Participants describe how they may find out after a period of time that a patient is not taking medications as directed,

because they cannot afford them. A family medicine physician (P10) describes cases when patients disclose financial barriers during follow-up visits; *“I’ve had patients that didn’t have money to buy their medicines.... It frustrates me because they’ll be out of their medicines for 2 months ... [they] tell me ... at their follow up visit. I [say], ‘Could you just call us? We will help you. Let us know instead of not taking your insulin for 2 months.’”* Another family medicine physician (P15) describes how she may find out over time that a patient does not understand aspects of the care regimen:

Sometimes if things are poorly controlled ... [I’ll] have them repeat ... back to me ... [to] make sure that they ... understand what I’m saying.... I will go through their medications 1 by 1 and find out they’re not taking them ... or not the way it was prescribed.... I’ll find out that way, but that’s after the fact. It’d be nice if I knew that up front.

6.4. Final Conceptual Model of Psychosocial Information Access

To summarize results of psychosocial information access, I built upon the initial model shown in chapter four (see Figure 4.3) to create the final conceptual model of psychosocial information access (see Figure 6.4). I have added clinical decisions, and availability and accuracy of psychosocial information.



PI – Psychosocial Information

PFs – Psychosocial Factors

* - Mean of responses to Likert scale responses: 5 – Very Important, 4 – Important, 3 – Neither Important nor Unimportant, 2 – Unimportant, 1 – Very Unimportant

** - % of Total Source Responses. Respondent could indicate more than one source.

*** - Responses captured in a Likert scale: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never

Figure 6.4: Final Conceptual Model of Psychosocial Information Access

6.5. Additional Psychosocial Information Desired

Physicians discuss how they would like to have access to specific psychosocial information because information they currently can access is not comprehensive. Moreover, participants contend that having access to more detailed psychosocial information would better inform clinical care decisions. I next outline the additional psychosocial information desired, but currently not accessed, according to the four groups of psychosocial factors.

Sociodemographic Psychosocial Factors

Physicians express interest in learning more about sociodemographic psychosocial information. Financial barriers, dietary practices based on cultural norms, level of

education, and religion are among the additional information desired to help inform clinical decisions because these psychosocial factors may limit patients' ability follow recommended self-care behavior. An internal medicine physician (P07) expresses the belief that the current practice of documenting occupational classification (i.e. exempt or non-exempt) is not a sufficient indicator of financial stress; *"understanding their financial situation might help. Because non-exempt (status) might not help. It might not give you that granular information ... It won't."* Further, documenting payor status does not provide adequate insight on potential barriers to self-care due to financial strain. A family medicine physician (P15) says, *"I don't know anything about their income ... unless ... they're Medicaid ... sometimes ... that's kind of [an] indication."* Another family medicine physician (P15) describes various psychosocial information she would like beyond what is currently documented. Additional information concerning education level, language, religion, transportation, and level of social support would also help inform clinical care; *"highest grade of school ... their preferred language ... preferred religion ... How do they get to their clinic appointments? Who is their contact person? Sometimes who they'll give you as their contact person may be totally different from the person who I think is the person who is key ... they may give their husband's name, but he's as clueless as the patient."* Another internal medicine physician (P11) details additional psychosocial information desired:

I would like to know more about the resources they have, first of all. Second, their mental activity levels. And third ... family support ... how much does your family support ... maintenance of your disease.... Your lifestyle ... religious beliefs ... we had a lot of cultures back home [India] which have a different eating pattern ... people do a lot of fastings everyday.

An internal medicine physician (P08) expresses need to know more about dietary practices based on culture, this would help her level of understanding of the patient's circumstance; *"What's their diet like? Why is their diet like that? Is it because of financial restrictions? Is it because they're Japanese and me telling them not to eat white rice is just not a practical thing to tell them?"*

Social Relationships/Living Condition Psychosocial Factors

Physicians describe additional information desired concerning a patient's home environment. One internal medicine physician (P08) explains the additional information desired, *"more of a description about their home situation or competing priorities"* (P08, Internal Medicine). An enhanced understanding of the home environment can help physicians understand dietary and smoking habits, or potential exposure to second hand smoke; *"if they're diabetic I'm even more concerned if they're smoking or ... if there's people in the house that are smoking ... Their living situation is really important ... If you're living with other people or eating with the other people, you're eating as well.... if there's kids at home ... there's juice at home, cookies, cakes, all that stuff"* (P07, Internal Medicine). P08 also states how additional information on how diabetes may be impacting the patient's family would be helpful:

If you could get patients to tell you something about honestly how supported they feel ... "Does this chronic disease influence your family?"... And, "In what ways does it help and in what ways it does not help your relationship with your family members?" [that] is the evidence you really need to make some decisions ... because the diabetes not only creates a medical problem, it creates a social problem. (P08, Internal Medicine)

Neighborhood/Community

Participants spoke to how knowledge of community factors can help distinguish barriers to care from the patient's desire to follow the self-care regimen. An internal

medicine physician (P07) shares how additional information about the patient's perceived safety of their neighborhood may help her understand specific barriers which helps her provide support in addressing them; *"their ability to exercise, either the safety of the neighborhood versus their personal willingness to be able to engage in exercise to help control their diabetes."* Another internal medicine physician (P08) describes the difficulty with determining potential barriers to self-care due to neighborhood psychosocial factors. Knowing more detailed information about community safety, such as crime statistics for specific areas of a community (e.g., census tract) would help her assess potential barriers. Simply knowing the patient's address may not be sufficient:

Knowing the communities ... having some sense of the broader context of things ... that's really fraught with problems, right? Because then you're totally relying on stereotypes we know that zip code ... does correlate pretty well with socioeconomic ... [but] sometimes it plays against you... One of my residents bought a house not too far from Frandor (Michigan) ... I'm from this area (central Michigan)... I made the assumption that she might be in an unsafe neighborhood.... It turns out ... it's a lovely neighborhood.... I had made some assumptions that were completely incorrect.... On the other hand ... they have a child care center that's right across from the hospital, and there was a shooting at the houses directly across the street from [it] ... So, you just never know.

6.6. Improvement Ideas

In light of current barriers, physicians offer specific ideas to improve the capabilities of current EHR tools to better support their use of psychosocial information to inform clinical care decisions. Enhancing detail on current documentation would be helpful to understand cultural influence on self-care practices. One family medicine physician (P12) discusses how "ethnicity", a common field in the record, is not a precise enough indicator of cultural norms that could inform diabetes care clinical decisions, especially for patients who are not born in the United States:

we label Hispanics, Latinos as being this [one]group ... but it's enormously diverse and very, very, very, very, very, different ... the Nepalese, the Iraqis ... their foods are different.... their diet ... how ... they eat ... their preferences, their cultural beliefs ... how they used to access care in their country, what their expectations may be.

He suggests including country of origin *and* ethnicity in the record, “*you could capture ... at registration ... what their ethnic group was and where they were born....*”

The family medicine physician (P12) suggests how to make this information more easily accessible. Linking ethnicity to detailed background information would give the practitioner a more comprehensive understanding of culture, and health beliefs, “[*country of origin and ethnicity*] could then tie to some very specific information regarding health that a clinician could either read prior to the visit, [*or*] after the visit, but would be linked to that particular chart.” Making this information easily usable in the record would help inform clinical decisions. An internal medicine physician (P08) suggests “pop-up” boxes that appear, for example, under the problem list; “*it would be interesting if ... on a problem list ... for diabetes ... [you could] tie [in] some comments.... If you hover over ... a whole list of things [appear] ... the psychosocial information ... 'During the winter doesn't exercise because no safe way to do so' ... things like that. [If I see that] I'm ... not going to worry so much about glycemic control.*”

6.7. Survey Findings – EHR Tools

Insights from the physician interviews concerning the perceived barriers to documenting and retrieving psychosocial information helped inform the online survey, which I administered to a larger, more diverse group of practitioners. I used the online survey to further probe perceptions concerning capabilities to document and retrieve psychosocial information for three specific EHR tools: templates, data fields, and free

text. I asked respondents to indicate how frequently these tools support the *documentation* and *retrieval* of psychosocial information. Also, I asked respondents to indicate the frequency with which they *felt confident* using these tools to document and retrieve psychosocial information to make, or provide input into, care decisions. I report results for all survey responses; I also isolate physician survey responses to examine any statistical significance between physician respondents and the combined group of nurse practitioners and diabetes educators.

6.7.1. Frequency with which EHR Tools Support Documentation and Retrieval

Respondents most frequently believe that *free text* tools support the documentation of psychosocial information, as shown in Table 6.7.1.1. I isolate physician responses in the table. The differences in responses for *data fields* are the only for which the differences are statistically significant.

Table 6.7.1.1 – Frequency that EHR Tools Support Documentation of Psychosocial Information

	Total (<i>n</i> = 154)	Primary Care Physicians (<i>n</i> = 34)	Nurse Practitioners & Diabetes Educators (<i>n</i> = 120)	<i>p</i> value
Free Text	3.84 (.864)	3.91 (.793)	3.83 (.886)	.607
Data Fields	3.57 (.783)	3.85 (.892)	3.49 (.733)	.017
Templates	3.51 (.842)	3.74 (.898)	3.45 (.818)	.081

Note. Respondents were asked to indicate the frequency that each of the three EHR tools support the documentation of psychosocial information. Responses were captured in a Likert scale: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never. Standard deviations listed in parenthesis.

Respondents most frequently believe that *free text* tools also support the retrieval of psychosocial information, as shown in Table 6.7.1.2. I isolate physician responses in the table. There are no statistically significant differences in responses.

Table 6.7.1.2 – Frequency that EHR Tools Support Retrieval of Psychosocial Information

	Total (<i>n</i> = 152)	Primary Care Physicians (<i>n</i> = 34)	Nurse Practitioners & Diabetes Educators (<i>n</i> = 118)	<i>p</i> value
Free Text	3.68 (.918)	3.68 (.843)	3.68 (.942)	.993
Data Fields	3.61 (.887) ^a	3.67 (.777) ^b	3.59 (.917)	.675
Templates	3.59 (.930)	3.50 (.992)	3.62 (.914)	.514

Note. Respondents were asked to indicate the frequency that each of the three EHR tools support the retrieval of psychosocial information. Responses were captured in a Likert scale: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never. Standard deviations listed in parenthesis.

^a *n*=151. ^b *n* = 33.

6.7.2. Confidence in Using EHR Tools

Respondents most frequently indicate that they are confident that *free text* tools support the documentation of psychosocial information, as shown in Table 6.7.2.1. I isolate physician responses in the table. There are no statistically significant differences in responses.

Table 6.7.2.1 – Confidence in Using EHR Tools to Support Documentation of Psychosocial Information

	Total (<i>n</i> = 153)	Primary Care Physicians (<i>n</i> = 34)	Nurse Practitioners & Diabetes Educators (<i>n</i> = 120)	<i>p</i> value
Free Text	4.16 (.852)	3.97 (.810) ^a	4.21 (.859)	.155
Data Fields	3.77 (.892)	3.76 (.855)	3.77 (.906) ^b	.962
Templates	3.76 (.911)	3.62 (.954)	3.80 (.898) ^b	.309

Note. Respondents were asked to indicate the frequency in which they had confidence in using the three EHR tools to support the documentation of psychosocial information Responses were captured in a Likert scale: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never. Standard deviations listed in parenthesis.

^a *n*=33. ^b *n* = 119.

Respondents also most frequently indicate that they are confident that *free text* tools support the retrieval of psychosocial information, as shown in Table 6.7.2.2. I

isolate physician responses in the table. There are no statistically significant differences in responses.

Table 6.7.2.2 – Confidence in Using EHR Tools to Support Retrieval of Psychosocial Information

	Total (<i>n</i> = 152)	Primary Care Physicians (<i>n</i> = 34)	Nurse Practitioners & Diabetes Educators (<i>n</i> = 118)	<i>p</i> value
Free Text	3.80 (.914)	3.65 (.684)	3.85 (.948)	.261
Data Fields	3.74 (.895)	3.68 (.684)	3.76 (.949)	.557
Templates	3.72 (.931)	3.53 (.896)	3.77 (.937)	.183

Note. Respondents were asked to indicate the frequency in which they had confidence in using the three EHR tools to support the retrieval of psychosocial information. Responses were captured in a Likert scale: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, 1 – Never. Standard deviations listed in parenthesis.

6.8. Conclusion

In this chapter, I answered my sixth research question by describing how practitioners experience barriers to the use of psychosocial information. I focused on the effectiveness of current EHR tools in documenting and retrieving psychosocial information in the course of making, or providing input into, type 2 diabetes care clinical decisions in the outpatient setting. Using the online survey data, I quantified the frequency that these tools support psychosocial information documentation and use, and the confidence level practitioners indicate in using these tools to support documentation and use.

I described how physicians used EHR tools to help inform clinical decisions. My analysis of the interview data enabled me to understand then describe how physicians use current EHR tools to help inform referral decisions and facilitate communication of clinical information across the care team. I also described how physicians can use their notes in the EHR to help trigger their memory in recalling specific psychosocial information concerning a patient case.

Next, I described concerns physicians expressed regarding how clinical practice constraints present barriers to use. I described how quality concerns, time constraints, timing of access to psychosocial information, and design of EHR tools present barriers. Time pressures limit their ability to discuss psychosocial information with patients. I described the tradeoff physicians make between documenting psychosocial information and spending time with their patients. Time constraints can impede their ability to use the EHR to document and retrieve psychosocial information. Practice incentives can also present barriers to use. Physicians are not incentivized to capture the patients' situation pertaining to psychosocial factors.

I also described how inconsistency across the care team presents barriers. Physicians question the benefit of taking the time to search the record for psychosocial information that may have been documented by another team member, given that this information is not documented consistently. Consequently, they may ask the patient instead of using the EHR. Physicians also expressed concerns with documenting psychosocial information in the record because other members of the care team may not interpret their notes accurately. For example, documenting the reasons for a patient's unhealthy self-care behavior may stigmatize the patient.

I outlined the specific barriers physicians described to using the EHR for documentation, then retrieval of psychosocial information. I arranged these barriers in two areas: 1) time required to capture psychosocial information and 2) the design of current EHR tools: data fields, templates, and free text. Physicians express that documenting the patient's social history is time consuming. As a result, they do not document some psychosocial information. The design of EHR tools is a barrier to both

documenting and retrieving psychosocial information. For instance, concerns about access to healthy foods or rationale for a certain HbA1c goal may include pertinent psychosocial information, but current tools are not designed to document or retrieve this information easily.

I then described the additional psychosocial information that physicians desire, but cannot access and subsequently use. Physicians indicated that this information is either unavailable or only becomes available too late, after the time when they could have made adjustments to help address barriers to care. For example, patients may not initially disclose a psychosocial barrier (e.g., financial strain that prevents them from taking medications as directed), which may impede timely response to addressing these problems. I also described how physicians express desire to know more about psychosocial factors such as: cultural norms that may affect dietary habits, health literacy, their home environment responsibilities, and occupational situation.

I described specific ideas physicians shared to improve the documentation and retrieval of psychosocial information. It would be helpful if tools could accommodate a more granular level of psychosocial information (e.g., “ethnicity” may not be sufficient to capture cultural beliefs or dietary preferences).

Last, I used my survey data analysis to describe the use and perceptions concerning specific EHR tools. I described how respondents indicated that free text tools most frequently support the documentation and retrieval of psychosocial information, when compared to data fields and templates. I concluded with describing confidence in using these tools to document and retrieve psychosocial information. Again, respondents

most frequently indicated high confidence free text tools for documentation and retrieval of psychosocial information.

In the next chapter, I summarize the study. I discuss my conclusions and offer implications for future work. I also outline the strengths and limitations of the investigation.

CHAPTER 7

DISCUSSION AND IMPLICATIONS

The pioneers have begun their work. It is far from finished. New fields, new enterprises are visible. The times call for the high spirit of the courageous pioneers among physicians, scientists, and nurses.

— Lillian Wald (1867 – 1940)

Founder of the Visiting Nurse Service in New York City

Investments in larger systems of economic, environmental, and social support produce health and support individuals' quest for well-being.

— Elizabeth H. Bradley

7.1. SUMMARY OF FINDINGS

Psychosocial Factors, and their relevance (RQ1)

Practitioners believe that psychosocial factors are relevant to consider in making clinical decisions because they affect self-care behavior known to influence diabetes outcomes. Physicians emphasized how the complexity of the diabetes care regimen requires that the patient is able to effectively “manage their lives.” They strongly consider the following six psychosocial factors because they present barriers to self-care, and can make it difficult for the patients to follow the recommended care regimen: financial strain, mental health status, life stressors, food security, social support, and health literacy. Financial strain is of particular note as it influences medication self-care. Also, a patient’s mental health status and level of social support are of import, since these factors may drive establishing higher HbA1c targets than are recommended in practice

guidelines, in part to avoid the potential risk of harm associated with hypoglycemic episodes.

My findings for practitioner perceptions of psychosocial factors are consistent with the literature I detailed in chapter two (section 2.3.1). For example, financial strain presents barriers to access medications, and influences medication self-care behavior (Jotkowitz et al., 2006; Kangovi et al., 2013).

How practitioners access psychosocial information (RQ2)

The patient is the most frequent source of psychosocial information. Patients provide physicians information to help them understand potential barriers to self-care, such as financial issues which prevent them from following recommended medication self-care. In addition, physicians describe how their patients state that their other responsibilities can cause them to focus on activities they determine are more important (i.e., occupational responsibilities) than diabetes self-care. Physicians also rely on the patient's family and caregiver(s) to access pertinent psychosocial information such as mental health status and level of social support. Other members of the care team provide support in assessing the nature of the particular barrier to self-care (i.e., health literacy), and offer support in making clinical decisions to address it. The EHR is also used as a source of psychosocial information. It can serve as a direct information source (i.e., regarding mental health status) and can also help provide information (i.e., using refill information) that can trigger a conversation about potential barriers.

These interview findings are generalizable based on the survey participants indicating the patient as the primary source (43%), followed by the family / caregivers (28.4%), other providers (15.5%), and the EHR (11.6%). These findings are consistent

with the literature I cited in chapter two (section 2.4.2), outlining how the patient is a source of psychosocial information (Kassirer et al., 2010). They also are also consistent with the literature indicating that the EHR is a source of psychosocial information for medication refill information (Doyle et al., 2012). These findings contribute to the literature by linking how practitioners access specific psychosocial information to the sources from which they acquire it, and how it helps inform their outpatient care decisions.

Conceptual Model of Psychosocial Information Access

The final conceptual model of psychosocial information access (see Figure 6.4) provides a framework for further investigation of the associations between psychosocial factors, information sources, and clinical decisions. The depiction of these associations fills a current persistent gap in clinical decision making models discussed in chapter two (section 2.4). The conceptual model describes *how* psychosocial information is accessed for the four types of diabetes clinical decisions investigated.

How practitioners use psychosocial information (RQ3)

Physicians use psychosocial information to help them develop a care regimen appropriate for the patient situation. This information helps them: assess the patient, understand the influencers on their self-care behavior, determine their capabilities (i.e., the degree to which they are able to “manage their lives”), and assess their level of comprehension of required self-care practices. Physicians consider the diabetes clinical practice guidelines (CPGs), but psychosocial factors can greatly influence deviations from them, in particular for establishing an appropriate target for HbA1c. This interview finding was confirmed in the survey results, which show that target level of control decisions are very frequently influenced by psychosocial factors.

Cognitive Map of Psychosocial Information Use

The cognitive map of psychosocial information use (see Figure 5.2) represents how physicians incorporate psychosocial information into their clinical decisions. It includes their thought processes to determine how CPGs may not directly apply to the patient situation and depicts triggers for consideration of psychosocial factors. The map also depicts how physicians access sensitive, pertinent psychosocial information from the patient, which informs the clinical decisions.

Physicians access psychosocial information by developing rapport with patients, facilitated by seeing them over a period of time. Continuity of care is important in developing the relationship. Physicians express the importance of “getting to know” their patients over multiple clinic visits; this helps them develop a trusting relationship with their patients. Through this connection, physicians are able to access personal, sensitive psychosocial information which patients share. Physicians detail the techniques they use to build the rapport necessary to create and maintain these trusting relationships; they provide a safe environment, free from judgment. They also empower patients with shared decision making by acknowledging the critical role patients have in influencing clinical decisions.

Psychosocial information informs practitioners’ assessment of the patient and all four types of diabetes clinical decisions I examined. This information informs subsequent judgments about the feasibility of treatment options, clinical risk, and patient needs. For example, treating an at-risk patient who experiences financial strain influences an assessment of patient capabilities and a related feasibility judgment, which then results in a decision to establish an HbA1c target lower than the target recommended in the guidelines. Further, physicians take financial strain and related capability and feasibility

judgments into account when making medications decisions, in particular selecting type of insulin, which has implications for financial strain based upon out-of-pocket costs. Physicians acknowledge that their decisions may be clinically suboptimal (i.e., selecting a less expensive insulin), but they reason that these decisions are appropriate based on their assessment of the patient situation.

When are Psychosocial Factors Considered (RQ4)

Psychosocial factors are specifically considered in three distinct types of circumstances: 1) *chronic* circumstances, which are based on ongoing situations (i.e., at-risk patients, when a patient is not reaching clinical goals); 2) *new* circumstances, which are based on an emergent situation (i.e., new patient, initial diagnosis); and 3) a *change* in circumstances, based on a variation in the patient's situation (i.e., A1c "spike", sudden, unhealthy self-care practices). They are not particularly considered if the patient seems to be doing well and meeting their clinical goals.

Practitioner characteristics' influence on use of Psychosocial Information (RQ5)

Physicians are consistent in their perceptions of the influence of psychosocial factors. Across the three clinical specialties represented in my sample—and level of experience from resident to thirty years of practice—all used psychosocial information to help inform their clinical decisions. The final conceptual model of psychosocial information use (see Figure 6.4) shows how the most pertinent psychosocial information is accessed, for which decisions, and barriers to use.

My survey findings extend the literature cited in chapter two (section 2.6) regarding practitioner role and influence of psychosocial factors. I found statistically significant difference between physicians and other practitioners. Nurses tend to believe

more frequently than physicians and diabetes educators that psychosocial factors influence self-care practices (Funnell, 2006; Rasch & Cogdill, 1999). Also, I found statistical significant differences in practitioner role for influence for *specific* clinical decisions. Nurse practitioners consider psychosocial factors more frequently than physicians for medications decisions. Diabetes educators consider them more frequently than physicians for referral decisions. These findings extend the knowledge concerning practitioner consideration of psychosocial factors to diabetes educators, beyond physicians and nurses. Furthermore, I found no statistical significance in examining difference of influence of psychosocial factors on clinical decisions between physician responses by specialty, nor for years of practice experience.

Barriers to Use – Efficacy of EHR Tools (RQ6)

Current EHR tools can present barriers to use. I have segmented barriers in two areas: 1) time required to document psychosocial information, and 2) the design of current tools.

Physicians express that time constrains present barriers to psychosocial information use. Since the patient is the most frequent source of psychosocial information, it follows that interview participants express that time restrictions hinder access to psychosocial information relevant to their clinical decisions. Physicians are quite confident in their skill to access this information, yet they generally do not have the time to probe on psychosocial information which could provide useful context on self-care behavior and potential barriers to care.

The design and capabilities of current EHR tools also present barriers to use. The time required to document psychosocial information is of particular note. The tools are

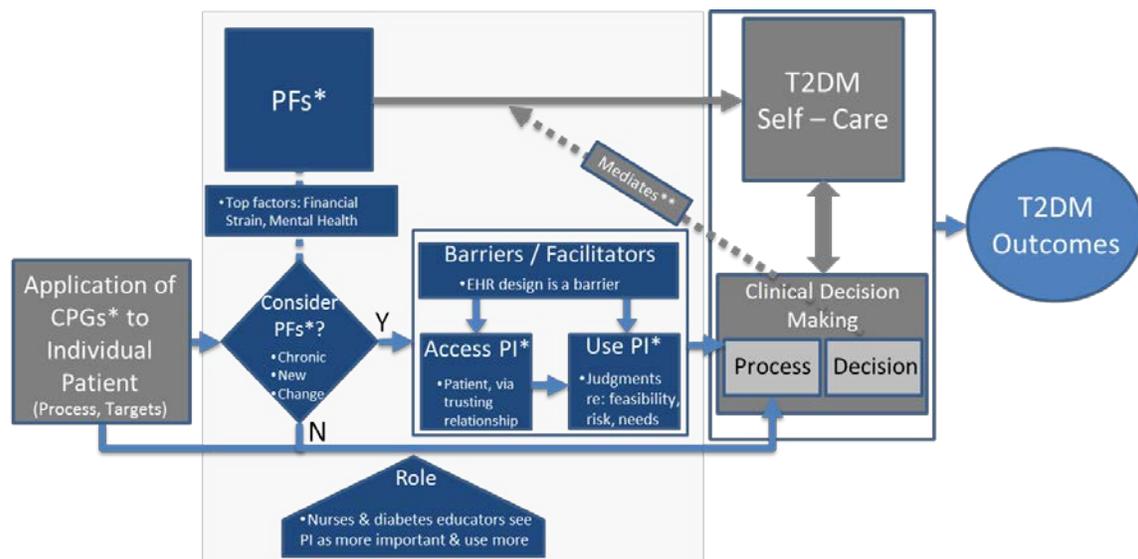
complex, and require physicians to maneuver through several layers to document pertinent information. Data fields and templates are not designed to capture psychosocial information such as level and nature of social support, or barriers to healthy food options. Physicians describe how spending the time required to document psychosocial information in the EHR can take time away from the patient consultation. Thus, they generally chose to talk to their patients.

7.2. Introduction

In the previous three chapters, I introduced the initial conceptual model of psychosocial information access (see Figure 4.3) which describes: the relevance of specific psychosocial factors, the sources of psychosocial information, and for which diabetes care clinical decisions this information is used. I also introduced the cognitive map of psychosocial information use (see Figure 5.2), which depicts how practitioners use this information to inform clinical decisions. In chapter six, I described barriers and facilitators to acquiring and using psychosocial information, which include practitioner perspectives on how current EHR tools may support, or hinder, their use of psychosocial information. I also introduced the final conceptual model of psychosocial information access (see Figure 6.4).

In this final chapter, I discuss and interpret my four major findings: 1) psychosocial information is not considered when patients are stable and well controlled, but it is considered when a patient: has persistent, poor glycemic control; is new to the practitioner or has a new diabetes diagnosis; or has worsening of glycemic control, 2) access to psychosocial information is granted through dialogue in the context of an ongoing, trusted relationship, 3) awareness of psychosocial information may trigger

decisions to personalize HbA1c targets, pursue less aggressive treatment plans or augment guideline-concordant treatment with actions to address barriers to care, and 4) current EHR designs are not optimized for capturing and retrieving qualitative and situationally dependent psychosocial information which tends to come in a narrative form. I revisit the initial conceptual framework I introduced in chapter two (see Figure 2.2) and include the study results to help illustrate where these major findings address gaps in the literature (see Figure 7.2). The dark blue boxes in the center of the framework depict how my major findings concerning psychosocial information address current gaps in the literature described in chapter two. The framework can be used to guide future work to investigate the associations between health outcomes, and the three key influencers of outcomes which my findings show are influenced by psychosocial factors: use of CPGs, clinical decision making, and efforts to improve patients' self-care practices.



- * - PFs – Psychosocial Factors
- * - PI – Psychosocial Information
- * - CPGs – Clinical Practice Guidelines
- ** - Clinical Decision Making mediates influence of PFs on self-care (i.e., when recommending resources for food, housing, etc.)

Figure 7.2: Final Conceptual Framework of Psychosocial Factors in Outpatient Diabetes Care

Taken together, my four major findings help further the understanding of *when* and *how* psychosocial information is used by practitioners as they provide diabetes care in the outpatient setting. I extend the insights from previous studies which describe: the influence of various psychosocial factors on diabetes outcomes (Arigo, Smyth, Haggerty, & Raggio, 2014; Bielamowicz et al., 2013; Moulton, Pickup, & Ismail, 2015; Piette & Kerr, 2006; Safford et al., 2005; Selby, 2010), information use for clinical decision making in outpatient care (Del Fiol et al., 2014; Doyle et al., 2012), and CPG use (Evert et al., 2014; Kirpitch & Maryniuk, 2011). I describe how practitioners use psychosocial information, which includes their rationale for diverging from practice guidelines in attempts to lessen the influence of barriers to recommended self-care due to psychosocial factors. For each major finding I also examine the implications. I conclude with a discussion of the strengths and limitations of the study.

7.3. Four Major Findings

- 1. Psychosocial Information is not considered when patients are stable and well controlled, but it is considered when a patient: has persistent, poor glycemic control; is new to the provider, or has a new diagnosis; or has worsening of glycemic control***

If the patient is stable and well controlled, psychosocial information may not be particularly relevant; however, in three specific situations psychosocial information is considered. In these circumstances, practitioners use psychosocial information to help them understand potential barriers to self-care and to inform their clinical decisions to help patients address them. First, psychosocial factors are relevant under *chronic* circumstances, such as when a patient experiences persistent, poor glycemic control or

when treating at-risk patients. Second, psychosocial information is considered under *new* circumstances, such as when seeing a new patient or when a patient is newly diagnosed with diabetes. Third, practitioners consider psychosocial information when there is a *change* in circumstances, such as when there is a worsening of glycemic control indicated by an increase (“spike”) in HbA1c and/or when there is sudden, unhealthy self-care behavior.

The literature I cite in chapter two (section 2.5.1) describes that physicians may consider the applicability of guidelines according to patient *cases*—a patient’s gender and age influenced frequency of foot exams (McKinlay et al., 2013). However, my findings revealed that these stable patient characteristics do not exclusively trigger consideration of psychosocial factors, and this study makes a novel contribution in that it is the only study of which I am aware that describes the specific, shifting *clinical circumstances* (e.g., a patient’s worsening glycemic control and/or self-care practices) in which practitioners consider psychosocial information to inform diabetes care decisions in the outpatient setting.

While I purposively sampled practitioners who are sensitive to psychosocial factors based on their experience with at-risk patients, this finding is of particular note given that patients’ lives are dynamic rather than static, and that their financial circumstances, social support, stressors and mental health may change over time. Further, it is useful to understand the specific circumstances when providing psychosocial information will be helpful to practitioners given that they are *already* exposed to large amounts of clinical data designed to support clinical decisions. The sheer volume of clinical data can exacerbate existing time demands (Haase, Follmann, Skipka, &

Kirchner, 2007), which practitioners can find overwhelming (A. Hall & Walton, 2004; Hübner-Bloder et al., 2011; Wright, McCoy, Henkin, Kale, & Sittig, 2013). This suggests the value of just-in-time information that is provided precisely during those clinical circumstances in which providers in my study deemed important.

Knowing when psychosocial information is used by practitioners to guide their care decisions is an important contribution to the objective of providing practitioners with the information they need, when they need it; this is critical since doing so remains a persistent challenge (Bass, DeVoge, Waggoner-Fountain, & Borowitz, 2012). Future research should focus on making pertinent psychosocial information available during these three circumstances which we now understand trigger consideration of psychosocial factors.

Further, these findings extend previous clinical decision making literature, specifically clinical decision support, through an enhanced understanding of the *circumstances* in which psychosocial information is used. They connect the influence of psychosocial factors to clinical decision making and help explain how clinical goals may be established outside of targets specified in the guidelines.

2. Access to psychosocial information is granted thorough dialogue in the context of an ongoing trusting relationship

In chapter five (section 5.4.1), I describe how physicians develop these relationships by using specific methods to demonstrate caring and establish and maintain a safe environment, void of pejorative language. They maintain the patient's privacy and empower them by acknowledging their role in the care regimen, which encourages shared decision making. These findings are consistent with prior research I described in chapter

two (section 2.4.1) which describes how the quality of the patient-doctor relationship increases the likelihood of disclosure of psychosocial information (Higgs, 2008; Robinson & Roter, 1999a, 1999b). Chronic disease patients with multiple providers—resulting from discontinuous care, multiple chronic conditions, or frequent hospitalizations—are at greater risk of low continuity of care (Haggerty et al., 2012; Kripalani et al., 2007). Continuity of care is an important contributor to a patient’s ability to follow self-care recommendations (Bodenheimer, 2008). Therefore, trusting relationships are an important determinant of regimen adherence, which influences diabetes outcomes (Delamater, 2006; Ritholz et al., 2014). Moreover, effective communication between the T2DM patient and their practitioner results in increased practitioner knowledge of patients, a positive predictor of healthy self-care practices and of chronic disease outcomes (Morrison et al., 2013; Singh-Manoux, 2003; Weyrauch, Rhodes, Psaty, & Grubb, 1995).

These findings provide additional support for the value of measuring and evaluating the quality of the practitioner-patient relationship, which has been shown to have a statistically significant effect on healthcare outcomes in studies focused on cross-cultural differences (De Faoite & Hanson, 2015). Findings also provide additional information as to *why* physicians value the quality of the practitioner-patient relationship; this may be because it grants them access to psychosocial information that enables them to access information pertinent to their clinical decisions which they believe result in better outcomes. There is a need for additional research examining how the quality of the practitioner-patient relationship influences chronic disease outcomes associated with chronic conditions (J. M. Kelley, Kraft-Todd, Schapira, Kossowsky, & Riess, 2014).

These findings contribute to the current literature by suggesting a *new mechanism* through which strong communication and a trusting, nurturing relationship potentially influences outcomes. The quality of the relationship enables access to pertinent psychosocial information, which subsequently is used to inform personalized care decisions intended to lessen the influence of barriers to recommended self-care caused by psychosocial factors. A stable, trusting relationship ensures the consistent availability of pertinent psychosocial information necessary to inform these personalized care decisions, which study participants *believe* result in better outcomes.

Physicians clearly described specific techniques they find effective to developing the relationships that enable access to sensitive psychosocial information. Insights concerning how physicians build and maintain trusting patient-doctor relationships should be used to further the understanding of mechanisms by which these relationships are established and maintained. These insights can be used to help extend research on the efficacy of training resources concerning patient engagement, and measuring its impact on outcomes.

3. *Awareness of Psychosocial Information may trigger decisions to personalize HbA1c targets, pursue less aggressive treatment plans or augment guideline-concordant treatment with actions to address barriers to care*

Practitioners use psychosocial information to help them understand and address barriers to self-care behavior, either through personalization of treatment plans or actions to address patients' support needs. Accordingly, psychosocial factors help inform the clinical decisions practitioners believe are most appropriate for the specific patient circumstance. I now discuss two particularly notable clinical decisions informed by

psychosocial information derived from the qualitative analysis: 1) determining the applicability of CPGs, and 2) medications decisions.

Applicability of Clinical Practice Guidelines (CPGs)

Practitioners use psychosocial information to determine the applicability of clinical practice guidelines (CPGs) based upon their understanding of the patient's current self-care behavior. A patient's financial circumstance, mental health status, and low level of social support may drive the decision to establish *higher HbA1c targets* than specified in the guidelines, in part to avoid the potential risk of harm associated with hypoglycemic episodes. They may also pursue less aggressive treatment plans or augment guideline-concordant treatment with actions to address barriers to care. These include referrals to prescription assistance, food support, counseling, and transportation aid.

These findings are important to consider in order to precisely evaluate clinician performance against clinical practice goals. They implore us to consider a more expansive perspective on what constitutes quality care. Indeed, findings imply that evaluating clinical performance solely against HbA1c targets is shortsighted. Research investigating approaches to report diabetes quality do not consider practitioners clinical decisions based upon *attempts to address* psychosocial barriers to self-care (Halladay et al., 2014; O'Connor et al., 2011; Oxendine, Meyer, Reid, Adams, & Sabol, 2014). Ignoring the diversity of patient circumstances, and practitioner appreciation of them, could result in performance indicators that miss recognition of practitioners who are *particularly attuned* to their patients' situations, and are making clinical decisions accordingly.

Medications decisions

I found that physicians' medications decisions in particular can be considerably influenced by psychosocial factors. Physicians attempt to *reduce the influence* of barriers to recommended medication self-care due to financial strain, low social support, or mental health issues. These decisions include selecting *type* of insulin, based on patient out-of-pocket cost and insurance coverage. Physicians acknowledge that such decisions may be clinically suboptimal, but they contend that they are appropriate based on their assessment of the patient situation, which can be informed by their understanding of the influence of psychosocial factors.

These findings are consistent with the literature concerning how financial strain presents barriers to access medications, and influences medication self-care behavior (Jotkowitz et al., 2006; Kangovi et al., 2013). However, these findings extend the current breadth of the clinical decision making literature in describing that, in certain patient circumstances, physicians *choose* to make “suboptimal” clinical decisions in their efforts to lessen the influence of barriers to self-care stemming from psychosocial factors; they do so intentionally. Furthermore, findings contribute to the clinical decision making literature by describing how consideration of psychosocial factors may affect the rate of practitioner adherence to clinical practice guidelines (Appiah et al., 2013; Gaucher, Lantos, & Payot, 2013; Goldstein, Lavori, Coleman, Advani, & Hoffman, 2005).

Confidence in decisions to help address self-care barriers

Study participants are confident in making clinical decisions to help address barriers to recommended self-care, *if they are aware of* barriers the patient may be experiencing. They regret learning “after the fact” about barriers to self-care caused by

psychosocial factors, rather than feeling incapable to support patients who may have difficulty with “managing their lives” due to psychosocial barriers.

In chapter two (section 2.6), I cite research which describes that although physicians may recognize the critical influence that psychosocial factors have on self-care behavior and health outcomes, they do not necessarily feel equipped to address psychosocial needs (Institute of Medicine, 2008; Robert Wood Johnson Foundation, 2011). In the context of diabetes care in particular, practitioners may not be confident in their ability to address the psychosocial barriers encountered by some diabetic patients. Again, my sampling approach offers a possible explanation for the divergence. My findings stem from a sensitized group of physicians, nurses and diabetes educators who may recognize the importance of psychosocial factors more so than practitioners who participated in these previous studies. The practitioners in my study sample have considerable experience in care settings acquainted with at-risk patients who present with psychosocial barriers to self-care, thus these settings may have established resources they call upon to help address barriers.

The literature describes how practitioners may make clinical decisions in order to avoid contextual errors, which can occur when a patient’s situation is not *accurately* assessed (Weiner et al., 2010). My findings provide insight on circumstances when practitioners may not have an accurate understanding of psychosocial barriers. Although study participants expressed confidence in knowledge of psychosocial barriers related to neighborhood setting, they may not be *correct* in their assumptions about barriers due to psychosocial factors. For example, in chapter six (section 6.5), I described how an internal medicine physician shared her misconceptions concerning crime in two areas of

Michigan; both areas in which she was familiar. Also, in chapter six (section 6.3.3), I described how physicians have real concerns about their ability to accurately assess health literacy. Extending this work to understand the results of these actions could support clinical decision support systems (CDSS) enhancement. For example, providing specific crime statistics at a more granular level (i.e., census tract) might enable practitioners to make more informed clinical decisions concerning neighborhood safety, a known psychosocial factor that influences self-care behavior (Cadzow et al., 2014; C. R. Clark et al., 2013; Jack et al., 2012; Krishnan et al., 2010).

Future research should also evaluate practitioner *beliefs* about the influence of psychosocial factors on self-care practices against what at-risk *patients* experience. Recently published research has described the effort that at-risk patients make in their attempts to adhere to the chronic care regimen; this “invisible work” performed by patients is done outside of the healthcare system. Therefore, this effort may not be recognized by practitioners (Senteio & Veinot, 2014).

Results can help support practitioners in offering strategies to address self-care barriers that actually influence diabetes outcomes. As capabilities are developed to improve the collection and use of psychosocial information, understanding the *efficacy of resulting clinical decisions* in addressing barriers will continue to be important. These results should help guide practice efforts to improve the documentation and use of psychosocial information that practitioners deem is important. Moreover, capabilities should determine the influence of specific psychosocial factors on self-care based on extant literature. This would help to confirm the practitioners’ perceptions of the relevance of psychosocial factors and their influence on self-care.

Since in this study I purposively sampled practitioners attuned to psychosocial factors, in subsequent research, it would be informative to study less-sensitized practitioners who are not necessarily actively engaged in care with large proportions of at-risk patients. Practitioners who serve patients who are *not* at-risk may perceive the relevance of psychosocial factors quite differently. Understanding how these practitioners may consider psychosocial factors as they make clinical care decisions can inform how these findings can be incorporated in a broader set of circumstances, including for clinical decisions beyond diabetes care. Also, interviews with non-physician practitioners who make or influence medications decisions would enable further understanding of potential associations of a broader set of clinical decisions based on practitioner role, again for diabetes clinical decisions and those for other chronic conditions.

Further study concerning tools and training to standardize the collection and use of pertinent psychosocial information across the entire care team could help increase the understanding of the influence of psychosocial factors. In particular, these tools should include screening for health literacy, which have been developed for diabetes care but are not widely used (Schillinger, Grumbach, Piette, Wang, Osmond, Daher, Palacios, et al., 2002). Making these tools available enables using the EHR for secondary research, such as in the field of clinical epidemiology. Such efforts could also be used for investigations of how access to psychosocial information influences its use, and the impact of its use as measured by subsequent clinical decisions and outcomes. Results would provide a more comprehensive perspective on psychosocial facilitators and barriers to self-care.

These results can also be used to help document and disseminate how practitioners support patients who are experiencing barriers to care based on psychosocial

factors. Future efforts to address diabetes outcomes should use practitioners' considerable knowledge of the influence of psychosocial factors on self-care, and the steps taken to address self-care barriers, to support the design of tools and processes to support clinical decision-making, and inform interventions designed to provide support for patients who may experience barriers to self-care. Further, they can be used to help train resident physicians in how to support patients who they learn are experiencing barriers to care due to psychosocial factors.

4. *Current EHR designs are not optimized for capturing and retrieving qualitative and situationally dependent psychosocial information which tends to come in a narrative form*

Study participants indicated that psychosocial factors frequently influence their clinical decisions, but they frequently do not have the information they need to inform these decisions. Barriers to access are primarily due to the current design of EHRs which make it difficult to use psychosocial information. Of the sources I investigated, participants indicated that the EHR is the *least frequently* used source of psychosocial information. This is primarily due to barriers to documenting and retrieving psychosocial information.

Findings from this research extend previous work by highlighting concerns regarding the documentation of psychosocial information in the EHR, which results in inconsistencies and concerns about data quality. Study participants indicate that a vital challenge to psychosocial information use lies in not learning of psychosocial barriers *soon enough*. This is related to the limitations of existing tools. In chapter six (section 6.3.5), I reported survey results for psychosocial information use for clinical decisions.

Respondents indicated they have the psychosocial information they need at a *lower frequency* than psychosocial information is considered. Physicians stated that psychosocial information is frequently not documented in, nor is it accessed from, the electronic medical record due to time constraints and design of current tools. This is consistent with research on the inpatient care setting I describe in chapter two (section 2.4.2), which also described that practitioners tend to not document psychosocial information (Zhou et al., 2009). Also, while recent research has described how use of the EHR *improves* the quality of clinical notes for documentation (Burke et al., 2015), my work is focused on psychosocial information use. That study only contrasted quality of EHR notes against *handwritten* notes.

These findings illuminate a potential gap in unmet needs. In chapter two (section 2.4.2), I cited literature concerning unmet information needs in primary care (Bass et al., 2012; Del Fiol et al., 2014). If the majority of information needs are not met, it follows that these decisions are not supported adequately with current, available tools. This finding supports the building motivation to further develop EHR capabilities to identify and capture psychosocial information, as evidenced by the 2014 Institute of Medicine reports recommending that EHR tools should improve the documentation of psychosocial information (Institute of Medicine, 2014a, 2014b). However, linking gaps in information needs to types of decisions that are currently unsupported is a unique contribution.

An important consideration in addressing barriers to documentation and use of sensitive psychosocial information is that doing so would potentially make it accessible to other members of the care team. While physicians emphasized the importance of protecting the patients' privacy from other patient family members they may know, or

may treat, they did not express explicit reservations about other members of the care team having access to sensitive psychosocial information *told to them*. They did however express concerns about stigmatizing patients if reasons for self-care were documented in the record. Providing access to sensitive psychosocial information across the care team has the potential to breach trust. Further research should examine how patients perceive the availability of their sensitive psychosocial information to other members of the care team. Findings would inform best approaches to sharing this information in the outpatient care setting, as a supplement to research previously mentioned focused on the inpatient care setting (Zhou et al., 2009, 2010).

Last, future research should investigate approaches to provide specific information which could quantify psychosocial “health”. A psychosocial “index” could help address the current gap of practitioners lacking an instrument to assess and track a patient’s psychosocial health. This instrument could serve much like clinical diabetes measures currently in wide use, such as: HbA1c, fasting blood sugar, and mental health measures like the Beck depression scale. The development of this psychosocial index could also give patients an opportunity to provide information concerning their current psychosocial health. The psychosocial factors I outline in Appendix B: *Psychosocial Factors* could serve as a starting point for developing the index, which should include specific psychosocial information elicited from the patient, the care team, and from other information sources, such as information about the crime rates in a patient’s neighborhood. Furthermore, I anticipate a platform for future research based on potential implementation of the aforementioned Institute of Medicine recommendations to enhance EHR capabilities concerning the use of psychosocial information (Institute of Medicine,

2014a, 2014b). Upon development of such an index, investigating its influence on clinical decision making and subsequent health outcomes should be examined. Health outcomes of interest include: HbA1c, cost of care, patient satisfaction, patient engagement, and practitioner satisfaction.

7.4. Strengths and Limitations

Strengths

A strength of this study is in the sequential exploratory design. In general, mixed methods research is recognized for its capacity to leverage both qualitative and quantitative methods (Curry et al., 2009). This design was well suited to investigate the degree to which insights developed from a few individuals can be generalized to a larger sample. This approach helped me address each of my research questions as I explored a considerable gap in understanding in an area of clinical decision-making—the role of psychosocial factors. It is well established in the literature that psychosocial factors influence self-care practices associated with diabetes outcomes; however, there was no common description for *how* they may influence care decisions. This design was appropriate given the gap I sought to fill.

Another strength of this study is that it enables a comprehensive exploration of the factors that influence clinical decisions heard directly from the physicians as they describe how they make diabetes care decisions as part of their regular clinical responsibilities. Including a variety of practitioner roles and levels of experience in the sample positioned the study well to describe how clinical decisions are made. Also, geographic diversity of practice settings enabled examination across clinical environments, as well as across various at-risk patient populations. In addition, my

recruitment of a sensitized group of practitioners facilitated in-depth investigation of the phenomenon of interest.

The generalizability of findings to a larger population was confirmed for findings regarding the specific psychosocial factors of import, the decisions influenced, and the situations in which psychosocial information is considered. This increased confidence in the interview findings concerning the relevance of specific psychosocial factors, and their influence on specific clinical decisions.

Limitations

The main limitation of this study is that it relies on a sensitized group of practitioners who are experienced with diabetes care for at-risk patients. Hence my sample was fairly homogeneous in their perspective in the importance and use of psychosocial factors. My findings should thus be interpreted considering that practitioner participants are familiar with psychosocial barriers to care; therefore, participants may have more experience and confidence in their ability to address them. In addition, care teams experienced with providing care for at-risk patients may have established clinical processes in place to help practitioners address psychosocial barriers, such as processes and relationships in place to refer patients to community-based resources. These may not be present in other clinical settings. Consequently, findings are not generalizable to all practitioners, particularly those without experience with at-risk patients.

Another limitation of this study design is that it relies on what the practitioner *says* influences their clinical care decisions, which is subject to bias associated with desirability and recall. Also, what individuals indicate influences their actions may differ from their actual beliefs and actions; this is an established phenomenon in qualitative

research (LaPiere, 1934; LeCompte & Goetz, 1982; Liebow, 1967). The findings are also limited because they are not considered against data contained in patients' medical records. Examining the clinical record to understand what clinical decisions are *actually* made would help investigate specific clinical decisions on a large scale, such as referral practices and medication decisions.

A further limitation of the initial qualitative data collection and analysis step is that I only interviewed physicians; I did not interview patients. Understanding the patients' perspectives on associations between psychosocial factors and self-care would help to understand what and how psychosocial factors may facilitate, or present barriers to, self-care practices. Further, I did not interview other members of the care team which could shed light upon how psychosocial factors may be considered in making, or influencing, diabetes care clinical decisions. There are two reasons for this. First, since physicians frequently have control over the greatest number of clinical decisions, a focus on these practitioners appeared warranted. I sought to understand physicians' *perceptions* of psychosocial factors, and describe them in the context of the "sensitizing concepts" drawn from the literature (Blumer, 1969). Second, I was seeking to fill the considerable gap in the literature as to *how* psychosocial factors may influence specific diabetes care clinical decisions, emphasizing patient populations who may be subject to barriers to care due to psychosocial factors. I focused on physicians with experience with these patient populations in order to get their perspectives based experience with numerous patient cases.

I used an online survey for a major portion for my data collection. There are several advantages and disadvantages to using surveys in research. Advantages include

breadth of coverage in a relatively short amount of time (K. Kelley et al., 2003). The survey sample, drawn from three different professional organizations, provided a high degree of exposure to practitioner perspectives. This wide scope enabled me to analyze a more representative sample, making it more generalizable to a population of primary care physicians, nurse practitioners, and diabetes educators, all experienced in diabetes care. However, the low response rates (29.8%) meant that the sample might differ systematically from the populations from which these samples were drawn. Given the topic of the study, I again anticipate that the respondents may have been a group that was particularly sensitized to psychosocial issues.

7.5. Conclusion

In this investigation, I detailed how practitioners access and use psychosocial information to inform diabetes care clinical decisions. Study participants were well acquainted with the influence of psychosocial factors, and used psychosocial information during new or problematic circumstances. Psychosocial information was granted primarily through dialogue that emerged in a trusting and ongoing clinical relationship. Participants generally used psychosocial information to address self-care barriers through personalization of HbA1c targets, less aggressive treatment plans and linking patients to supplemental resources. However, they were not always aware of relevant psychosocial factors. Findings revealed opportunities for improving the capture and retrieval of psychosocial information; such improvements would necessarily focus on better accommodation of information in narrative form. As developers continue to evolve electronic tools in their capabilities to collect, analyze, and provide personal health information, psychosocial information should also be included because of its direct

influence on clinical decision-making, and potentially ultimately on diabetes-related health outcomes.

APPENDICES

Appendix A Definitions

Outpatient care – where the patients stay at the hospital or clinic from registration to discharge over the course of a single day. It is the most common setting where diabetic patients access their health care (Willens et al., 2011)

Electronic Health Record (EHR) – digitally stored healthcare information throughout an individual's lifetime with the purpose of supporting continuity of care, education, and research. The EHRs may include such things as observations, laboratory tests, medical images, treatments, therapies; drugs administered, patient identifying information, legal permissions (Ajami & Arab-Chadegani, 2013; Hillestad et al., 2005)

Hypoglycemia – low blood sugar, if not treated can lead to seizure, unconsciousness

Patient-Centered Decision Making (PCDM) - incorporates clinically relevant, patient-specific circumstances and behaviors, that is, the patient's context, into formulating a contextually appropriate plan of care. The objective was to develop a method for analyzing physician-patient interactions to ascertain whether decision-making is patient-centered. (Weiner et al., 2014)

Primary Care – The Institute of Medicine (IOM) defines primary care as ‘the provision of *integrated, accessible health care services* by clinicians who are *accountable* for addressing a large *majority of personal health needs*, developing a *sustained partnership with patients*, and practicing in the *context of family and community* (Donaldson, Yordy, Lohr, & Vanselow, 1996). Specialties associated with primary care include: family practice, general practice, general internal medicine, and pediatrics (Gorman & Helfand, 1995)

Appendix B Psychosocial Factors

This is a description of the psychosocial factors investigated in the practitioner survey.

Sociodemographic psychosocial factors

1. Financial strain	lack of resources that impact access to food, safe housing, transportation, or medications
2. Employment	job demands that may influence self-care (e.g. work hours, type of job, ability to take time off for self-care)
3. Payor status/Type of insurance	if a patient has insurance coverage, type of coverage, private insurance, government health insurance (Medicare, Medicaid, Military, State-specific plans, Indian Health Service) (United States Census Bureau, 2014)
4. Culture and spirituality	cultural norms and traditions which include dietary practices, faith beliefs, and practices (Kittler, 1995; Kittler & Sucher, 1995a)
5. Other responsibilities	work, family responsibilities (e.g. serving as caregiver for elderly adults), self-care activities
6. Level of education	level of formal schooling
7. Literacy	Literacy is the ability to use printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential (National Center for Education Statistics, 2014)
8. Country of origin	U.S. born or non-U.S. born, Immigrant status
9. Level of English proficiency	ability to understand and speak English

Psychological psychosocial factors

1. Mental health status	appearance; manner and approach; orientation, alertness, and thought processes; mood and affect (National Institute of Mental Health, 2014)
2. Life Stressors	negative events, chronic strains, traumas (Thoits, 2010)

3. T2DM perceptions-beliefs	perceptions of the relative quality-of-life effects of complications and treatments (Huang, Brown, Ewigman, Foley, & Meltzer, 2007)
4. Health Literacy	measure of patients' ability to read, comprehend, and act on medical instructions (Schillinger, Grumbach, Piette, Wang, Osmond, Daher, Palacios, et al., 2002)
5. Health Numeracy	the degree to which individuals can obtain, process, and understand the basic quantitative health information and services they need to make appropriate health decisions (Institute of Medicine of the National Academies, 2014)

Social Relationship/Living Conditions psychosocial factors

1. Social Support	social isolation, social connections, support includes four dimensions: appraisal support, informational support, instrumental support and emotional support. (Funnell, 2010)
2. Threat of violence - from abusive relationship(s)	a pattern of coercion, physical abuse, sexual abuse, or threat of violence in personal relationships (Krug, 2002)
3. Threat of violence - from community	perception of violence caused by violence-inducing or violence-protecting conditions (Sampson, Morenoff, & Raudenbush, 2005)

Neighborhood/Community psychosocial factors

1. Patient's Rural/Urban/Suburban residence setting	residency setting, may influence health care utilization or access (Spoont et al., 2011)
2. Neighborhood residence	physical aspects of a neighborhood that influence a patient's ability to purchase products (food), enable mobility, and interact and informally monitor another's behavior (D. A. Cohen et al., 2003)
3. Housing security	Stable housing, access to affordable, safe housing (Johns Hopkins Center to Eliminate Cardiovascular Health Disparities, 2014a)
4. Food security	access to fresh, healthy, and affordable food (Walker, Keane, & Burke, 2010)
5. Access to transportation	barriers which can lead to missed appointments, missed or delayed medication use (Syed, Gerber, & Sharp, 2013)
6. Access to places to exercise	accessible facilities, include perception of safe places to exercise (Bennett et al., 2007)

Appendix C

Type 2 Diabetes Clinical Decisions

This is a description of the type 2 diabetes care decisions investigated in the provider survey.

Target level of control care decisions

1. Establish target goal for blood glucose
2. Establish target goal for HbA1c
3. Incorporate input from patient in setting goal
4. Other Target Goal Decision(s)

Medications care decisions

1. Select a specific medication (e.g. long acting insulin or short acting insulin)
2. Select a brand, or a generic medication
3. Start a patient on first oral diabetes medication
4. Adjust oral diabetes medication dosage
5. Add an additional (2nd, 3rd, 4th, etc.) oral diabetes medication
6. Start a patient on injectable insulin
7. Adjust injectable insulin dosage
8. Start a patient on non-insulin injectable diabetes medication (e.g. GLP-1)
9. Adjust non-insulin injectable diabetes medication (e.g. GLP-1)
10. Reduce complexity of medication regimen
11. Other Medication Decision(s)

Making Referrals care decisions

1. Refer a patient to specialty care (e.g. endocrine, mental health, etc.)
2. Refer a patient to support services outside the organization (e.g. social work, housing, transportation, etc.)
3. Refer a patient to support services within the organization (e.g. social work, housing, transportation, etc.)
4. Refer a patient to diabetes education
5. Refer a patient to a dietitian and/or nutritional information
6. Other Referral Decision(s)

Making Recommendations care decisions

1. Make dietary recommendations
2. Make physical activity recommendations
3. Recommend a patient's caregivers understand what is required of patient
4. Frequency of clinical visits
5. Other Recommendation Decision(s)

Appendix D

Outline of ADA Standards of Care s

I. CLASSIFICATION AND DIAGNOSIS
A. Classification
B. Diagnosis of diabetes
C. Categories of increased risk for diabetes (prediabetes)
II. TESTING FOR DIABETES IN ASYMPTOMATIC PATIENTS
A. Testing for type 2 diabetes and risk of future diabetes in adults
B. Screening for type 2 diabetes in children
C. Screening for type 1 diabetes
III. DETECTION AND DIAGNOSIS OF GDM - Gestational diabetes mellitus
IV. PREVENTION/DELAY OF TYPE 2 DIABETES
V. DIABETES CARE
A. Initial evaluation
B. Management
C. Glycemic control
1. Assessment of glycemic control
a. Glucose monitoring
b. HbA1c
2. Glycemic goals in adults
D. Pharmacological and overall approaches to treatment
1. Insulin therapy for type 1 diabetes
2. Pharmacological therapy for hyperglycemia in type 2 diabetes
E. MNT - medical nutrition therapy
F. Diabetes self-management education and support
G. Physical activity
H. Psychosocial assessment and care
I. When treatment goals are not met
J. Intercurrent illness
K. Hypoglycemia
L. Bariatric surgery
M. Immunization
VI. PREVENTION AND MANAGEMENT OF DIABETES COMPLICATIONS
A. Cardiovascular disease (CVD)
1. Hypertension/blood pressure control
2. Dyslipidemia/lipid management
3. Antiplatelet agents
4. Smoking cessation
5. CHD screening and treatment
B. Nephropathy screening and treatment

C. Retinopathy screening and treatment
D. Neuropathy screening and treatment
E. Foot care
VII. ASSESSMENT OF COMMON COMORBID CONDITIONS
VIII. DIABETES CARE IN SPECIFIC POPULATIONS
A. Children and adolescents
1. Type 1 diabetes
a. Glycemic control
b. Screening and management of chronic complications in children and adolescents with type 1 diabetes
i. Nephropathy
ii. Hypertension
iii. Dyslipidemia
iv. Retinopathy
v. Celiac disease
vi. Hypothyroidism
c. Self-management
d. School and day care
e. Transition from pediatric to adult care
2. Type 2 diabetes
3. Monogenic diabetes syndromes
B. Preconception care
C. Older adults
D. Cystic fibrosis–related diabetes
IX. DIABETES CARE IN SPECIFIC SETTINGS
A. Diabetes care in the hospital
1. Glycemic targets in hospitalized patients
2. Antihyperglycemic agents in hospitalized patients
3. Preventing hypoglycemia
4. Diabetes care providers in the hospital
5. Self-management in the hospital
6. MNT in the hospital
7. Bedside blood glucose monitoring
8. Discharge planning and DSME
B. Diabetes and employment
C. Diabetes and driving
D. Diabetes management in correctional institutions
X. STRATEGIES FOR IMPROVING DIABETES CARE
Objective 1: Optimize provider and team behavior
Objective 2: Support patient behavior change
Objective 3: Change the system of care

(American Diabetes Association, 2015)

Appendix E

Interview Participants

	Specialty	Year Finished Residency	Current Practice Location	Practice Setting	Date	Duration (hh:mm:ss)
P01	Family Medicine	1998	Manchester, NH	FQHC	2.25.2014	46:30
P02	Internal Medicine	1995	Hartford, CT	Clinic of Public Hospital	2.25.2014	45:44
P03	Internal Medicine	2012	E. Lansing, MI	Clinic of Public Hospital	2.28.2014	34:50
P04	Internal Medicine	2015	Detroit, MI	Clinic of Public Hospital	3.20.2014	57:37
P05	Endocrinology	2012	Detroit, MI	Clinic of Public Hospital	3.31.2014	49:46
P06	Family Medicine	2007	Ann Arbor, MI	Clinic of Teaching Hospital	5.29.2014	1:08:39
P07	Internal Medicine	2004	Ann Arbor, MI	University Teaching Hospital	6.9.2014	1:01:10
P08	Internal Medicine	2000	E. Lansing, MI	University Teaching Hospital	6.23.2014	56:39
P09	Internal Medicine	1991	Dallas, TX	Clinic of Private Hospital	6.25.2014	50:19
P10	Family Medicine	2007	Dallas, TX	Community Clinic	6.25.2015	1:00:27
P11	Internal Medicine	2010	Dallas, TX	Community Clinic	6.25.2014	54:45
P12	Family Medicine	1984	Boston, MA	Community Clinic	6.27.2014	1:12:23
P13	Internal Medicine	2009	Ann Arbor, MI	VA, University Teaching Hospital	7.10.2014	1:10:30
P14	Family Medicine	2010	Ann Arbor, MI	VA, University Teaching Hospital	7.15.2014	1:04:46
P15	Family Medicine	2011	Ann Arbor, MI	VA, University Teaching Hospital	7.15.2014	1:20:49
P16	Family Medicine	1998	Ann Arbor, MI	VA, University Teaching Hospital	7.29.2014	1:05:21
P17	Family Medicine	2003	Portage, IN	FQHC	1.16.2015	49:02

Appendix F

Emails Used for Survey Distribution

Genesis Physicians Group

Genesis Physicians Group – Initial Email To PODs - 2.5.2015

To:Genesis PODS
Send Date:February 5, 2015 @ 10:00 AM
Link Type:Individual Link
Show Link Options
From Address:csenteio@umich.edu
From Name:AMD POD leader
Reply-To Email:csenteio@umich.edu
Subject:GAPN POD Communication – Online Survey – Response Requested



Genesis Accountable
Physician Network

Dr. \${m://FirstName} \${m://LastName},

I want to introduce myself to you as the GAPN Associate Medical Director (AMD) for your practice. Along with you, approximately 15 other PCPs have been clustered into a “POD” according to geographic region. Currently GAPN has 6 PODs, totaling approximately 100 PCPs.

- GAPN is working diligently to engage each Primary Care Physician member in communicating KEY information thru their GAPN Associate Medical Director.
To get started, I wanted to ask that you take 10 minutes and complete this online survey concerning type 2 diabetes care, even if you may have completed it in the past couple of months.

Follow this link to the Survey:

[\\${l://SurveyLink?d=Take the Survey}](#)

Or copy and paste the URL below into your internet browser:

[\\${l://SurveyURL}](#)

The survey is an important first step and will help GAPN understand how its PCP members consider psychosocial information in making type 2 diabetes care decisions, and under which circumstances they use that information. Additionally, the survey will instruct us with how effective email communication works for important GAPN messages. We would like to learn:

- The level of physician engagement between the physicians and the Associate Medical Director (AMD)
 - GAPN’s effectiveness in responding to information physicians share about their practice patterns and needs
- I ask that you please complete the survey in the next 5-7 days, as we intend to communicate the results during the first POD meeting of 2015. I will track the completion percentage of my POD and, as needed, may reach out to you with a gentle reminder to complete the survey.

Thank you in advance for your involvement in GAPN, and I look forward to working with you in 2015.

Sincerely,

Fname, LName

GAPN, Associate Medical Director

Follow the link to opt out of future emails:

[\\${l://OptOutLink?d=Click here to unsubscribe}](#)

Genesis Physicians Group – Reminder Fax - 3.6.2015



Genesis Accountable
Physician Network

March 6, 2015

Re: Reminder – Request to Complete Diabetes Care Survey

Dear GAPN POD member,

This is a reminder to please complete the survey emailed to you from your GAPN Associate Medical Director POD back on February 5th. Below is a copy of the email. Please check your SPAM Folder if you have not seen this email. We will send a reminder email on Friday, March 6th at 5pm. The survey is only accessible via the link in the survey email.

Sincerely,

Jim Walton
President & CEO

Dr. [FirstName] [LastName],

I want to introduce myself to you as the GAPN Associate Medical Director (AMD) for your practice. Along with you, approximately 15 other PCPs have been clustered into a “POD” according to geographic region. Currently GAPN has 6 PODs, totaling approximately 100 PCPs.

- GAPN is working diligently to engage each Primary Care Physician member in communicating KEY information thru their GAPN Associate Medical Director.

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Or copy and paste the URL below into your internet browser:

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- GAPN’s effectiveness in responding to information physicians share about their practice patterns and needs

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Thank you in advance for your involvement in GAPN, and I look forward to working with you in 2015.

Sincerely,

GAPN, Associate Medical Director

Genesis Physicians Group – Reminder Email - 3.6.2015

To:Genesis PODS
Send Date:March 6, 2015 @ 6:00 PM
Link Type:Individual Link
Show Link Options
From Address:csenteio@umich.edu
From Name:AMD POD leader
Reply-To Email:csenteio@umich.edu
Subject:GAPN POD Communication – Online Survey – Response Requested



Genesis Accountable
Physician Network

Dear GAPN POD member,
This is a reminder to please complete the survey emailed to you from your GAPN Associate Medical Director POD back on February 5th. Below is a copy of the email, with a link to access the survey.
Sincerely,

Jim Walton
President & CEO

Dr. \${m://FirstName} \${m://LastName},

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 - GAPN's effectiveness in responding to information physicians share about their practice patterns and needs
- I ask that you please complete the survey in the next 5-7 days, as we intend to communicate the results during the first POD meeting of 2015. I will track the completion percentage of my POD and, as needed, may reach out to you with a gentle reminder to complete the survey.

Thank you in advance for your involvement in GAPN, and I look forward to working with you in 2015.

Sincerely,

GAPN, Associate Medical Director

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[\\${l://OptOutLink?d=Click here to unsubscribe}](#)

Genesis Physicians Group – Reminder Email from J. Walton - 3.11.2015

From: Jim Walton
Sent: Wednesday, March 11, 2015 1:46 PM
To: GAPNPODLEADERS
Subject: AMD Alert

All,

I continue to work on discovering how best to communicate with the POD members. The graphics below reveal how your colleagues are responding to a request from GAPN and the AMDs.

- Could you please take a look and see if there is anything you can do to call, email or fax your POD members that have NOT responded to the communication?
- The last idea I have, is to try mailing a letter and asking the physicians to complete the survey to see what the rate of response might be.

What are your thoughts? Please send me an email to see how to proceed.

Thanks

Jim

Jim Walton
President & CEO

Genesis Physicians Group
5501 LBJ Freeway, Suite 950
Dallas, TX 75240
Direct: [972-419-0047](tel:972-419-0047)
Cell: [214-399-8993](tel:214-399-8993)
Fax: [972-239-3734](tel:972-239-3734)

Learn more about Genesis:

www.genesisdocs.org
www.genesisaco.com

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Genesis Physicians Group – Reminder Letter from J. Walton - 4.7.2015



Genesis Accountable
Physician Network

[First Name] [Last Name]
[Address 1]
[Address 2]
[City, State Zip]

April 7, 2015

Re: Reminder – Request to Complete Diabetes Care Survey Emailed to You

Dear [First Name] [Last Name],

This is a reminder to please complete the survey emailed to you at [email address] from your GAPN Associate Medical Director on February 5th. A reminder email was sent on Friday, March 6th at 5pm from this address csenteio@umich.edu. The diabetes care survey is an important initial step to engage each Primary Care Physician member in communicating KEY information thru your GAPN Associate Medical Director. The survey is only accessible via the link in the email, please check your spam folder if it is not in your inbox. If you need the email resent, please contact Charles Senteio at csenteio@umich.edu.

Sincerely,

Jim Walton
President & CEO

North Texas Nurse Practitioners (NTNP)

NTNP – Initial Email – 11.20.2014

To: Providers (NTNP)_11.20.2014
Send Date: November 20, 2014 @ 10:04 PM
Link Type: Individual Link
Show Link Options
From Address: csenteio@umich.edu
From Name: Badia Harlin
Reply-To Email: csenteio@umich.edu
Subject: Psychosocial Factors in Diabetes Care [Provider Survey]

Dear Colleagues with the North Texas Nurse Practitioners:
I am writing to ask for your help in completing a 10-minute, online provider survey.

I am supporting a University of Michigan health informatics study focusing on the psychosocial patient factors you may consider when caring for your type-2 diabetes patients in the outpatient setting. As part of this effort, this survey is designed to collect provider perspectives on psychosocial information. The overall goal is to enhance personalized care by increasing access to patient psychosocial information.

This survey is critical to helping understand how providers may consider this information, and under which circumstances. The study aim is to better support care teams as they make, and influence, care decisions such as "the right drug at the right time," and making referrals and recommendations.

As you know, several different provider roles can be involved in these important decisions. Your input is critically important.
I would greatly appreciate you taking approximately 10 minutes of your time to complete the survey.

If you have any level of experience seeing adult type-2 patients in the outpatient setting, and are willing to fill out the survey, please click on this link to take the survey

[SurveyLink?d=Take the Survey]
Or copy and paste the URL below into your internet browser:
[SurveyURL]

If you have any questions on the survey, or the study, please contact Charles Senteio, the study Principal Investigator, at csenteio@umich.edu.

Thank you,

Badia Harlin, DNP, FNP-c

Follow the link to opt out of future emails:
[!://OptOutLink?d=Click here to unsubscribe]

Michigan Association of Diabetes Educators (Diabetes Educators)

Diabetes Educators – Initial Email – 12.2.2014

Dear Colleagues at the Michigan Branch of the American Association of Diabetes Educators:

I am writing to ask for your help in completing a 10-minute, online provider survey.

I am supporting a University of Michigan health informatics study focusing on the psychosocial patient factors you may consider when caring for your type-2 diabetes patients in the outpatient setting. As part of this effort, we are using this survey to collect provider perspectives on psychosocial information. Our overall goal is to enhance personalized care by increasing access to patient psychosocial information.

This survey is critical to helping us understand how providers may consider this information, and under which circumstances. Our aim is to better support care teams as they make, and influence, care decisions such as "the right drug at the right time," and making referrals and recommendations.

As you know, several different provider roles can be involved in these important decisions. Therefore we are currently surveying physicians, physician assistants, nurse practitioners, registered nurses, and clinical pharmacists. Your input as Diabetes Educators is critically important. I would greatly appreciate you taking approximately 10 minutes of your time to complete the survey.

If you have any level of experience seeing adult type-2 patients in the outpatient setting, and are willing to fill out the survey, please click on the link below or paste the address in your browser.

https://umich.qualtrics.com/SE/?SID=SV_41GUqpUIJtLiOF

Please contact Charles Senteio, the study Principal Investigator, at csenteio@umich.edu if you have specific questions regarding the study, or the survey.

Thank you,

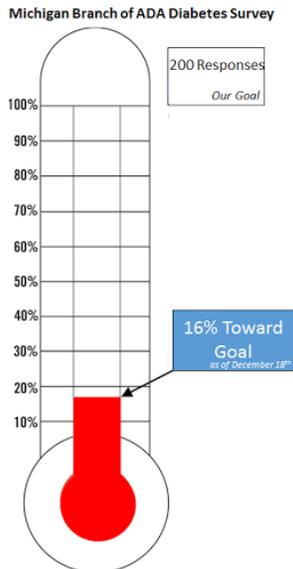
Martha M. Funnell, MS, RN, CDE
Associate Research Scientist
Department of Learning Health Sciences
Michigan Diabetes Research and Training Center
1111 E. Catherine St.
225 Victor Vaughan
Ann Arbor, MI 48109-2054
T-[\(734\) 936-9237](tel:(734)936-9237)
F-[\(734\) 936-1641](tel:(734)936-1641)
mfunnell@umich.edu

Diabetes Educators – Reminder Email – 12.182014

Dear Colleagues at the Michigan Branch of the American Association of Diabetes Educators (or MODE for those of you in my age bracket):

This is a reminder email regarding an online survey I sent back on December 2nd. The survey is part of a UM health informatics study concerning psychosocial factors and diabetes care.

Thanks to those of you who have submitted your responses! Our preliminary findings based on what you provided are very helpful to our goal of understanding how patient psychosocial factors impact diabetes care. We are currently 16% toward our response goal.



For those of you with any level of experience seeing adult type-2 patients in the outpatient setting who have not yet taken the opportunity to complete the survey, please consider doing so by accessing this link: https://umich.qualtrics.com/SE/?SID=SV_41GUqpPUIJtLiOF
I am also including below additional detail on our study objectives, which was also sent in my original email.

Martha M. Funnell, MS, RN, CDE
Associate Research Scientist
Department of Learning Health Sciences
Michigan Diabetes Research and Training Center
1111 E. Catherine St.
225 Victor Vaughan
Ann Arbor, MI 48109-2054
T-(734) 936-9237
F-(734) 936-1641
mfunnell@umich.edu

Diabetes Educators – Reminder Email – 1.5.2015

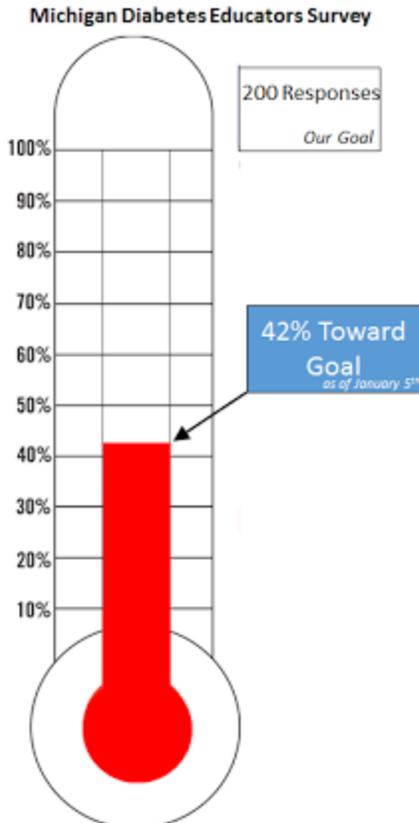
Dear Colleagues at the Michigan Branch of the American Association of Diabetes Educators (or MODE for those of you in my age bracket):

This is another reminder email regarding an online survey I sent back on December 2nd. The survey is part of a UM health informatics study concerning psychosocial factors and diabetes care.

Thanks to those of you who have submitted your responses! Our preliminary findings based on what you provided are very helpful to our goal of understanding how patient psychosocial factors impact diabetes care. We are currently 42% toward our response goal.

For those of you with any level of experience seeing adult type-2 patients in the outpatient setting who have not yet taken the opportunity to complete the survey, please consider doing so by accessing this link: https://umich.qualtrics.com/SE/?SID=SV_41GUqpPUIJtLiOF

I am also including below additional detail on our study objectives, which was also sent in my original email.



I am supporting a University of Michigan health informatics study focusing on the psychosocial patient factors you may consider when caring for your type-2 diabetes patients in the outpatient setting.

As part of this effort, we are using this survey to collect provider perspectives on psychosocial information. Our overall goal is to enhance personalized care by increasing access to patient psychosocial information.

This survey is critical to helping us understand how providers may consider this information, and under which circumstances. Our aim is to better support care teams as they make, and influence, care decisions such as "the right drug at the right time," and making referrals and recommendations.

As you know, several different provider roles can be involved in these important decisions. Your input as Diabetes Educators is critically important.

I would greatly appreciate you taking approximately 10 minutes of your time to complete the survey.

Please contact Charles Senteio, the study Principal Investigator, at csenteio@umich.edu if you have specific questions regarding the study, or the survey.

Martha M. Funnell, MS, RN, CDE
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T-(734) 936-9237
F-(734) 936-1641
mfunnell@umich.edu

Diabetes Educators – Reminder Email – 1.23.2015

Dear Colleagues at the Michigan Branch of the American Association of Diabetes Educators (or MODE for those of you in my age bracket):

This is another reminder email regarding an online survey I sent at the end of December. The survey is part of a UM health informatics study concerning psychosocial factors and diabetes care.

Thanks to those of you who have submitted your responses! Our preliminary findings based on what you provided are very helpful to our goal of understanding how patient psychosocial factors impact diabetes care. **We are currently 56% toward our response goal!**

For those of you with any level of experience seeing adult type-2 patients in the outpatient setting who have not yet taken the opportunity to complete the survey, please consider doing so by accessing this link: https://umich.qualtrics.com/SE/?SID=SV_41GUqpPUIJtLiOF

I am also including below additional detail on our study objectives, which was also sent in my original email.



I am supporting a University of Michigan health informatics study focusing on the psychosocial patient factors you may consider when caring for your type-2 diabetes patients in the outpatient setting.

As part of this effort, we are using this survey to collect provider perspectives on psychosocial information. Our overall goal is to enhance personalized care by increasing access to patient psychosocial information.

This survey is critical to helping us understand how providers may consider this information, and under which circumstances. Our aim is to better support care teams as they make, and influence, care decisions such as "the right drug at the right time," and making referrals and recommendations.

As you know, several different provider roles can be involved in these important decisions. Your input as Diabetes Educators is critically important.

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Appendix G

Semi-Structured Interview Guide

1. Describe your experience in treating adult, type 2 diabetes patients.
[**Specific Probes:** Length of time treating adult T2DM patients? Current practice setting? Types of T2DM patient population(s) you have treated (e.g. rural/urban; income level; payor status; age, gender, comorbidity-which?)]

2. Describe situations in which you strongly consider clinical practice guidelines? In which situations do you consider them less?
[**Specific Probes:** When you do consider them less, what factors do you consider in establishing alternative treatment goals for specific patients, which we'll refer to as 'patient-centered care goals? What are some examples of these patient-centered care goals that may differ from CPGs, or those that may be organizational or practice goals (e.g. HbA1c of 7.8, instead of 7.0)? What *patient characteristics* trigger consideration?]

3. There is no one, universal definition of psychosocial factors (Martikainen et. al., 2002). For the purposes of this study, we define psychosocial factors as those that are *not* genetic, nor directly driven by comorbid conditions; they are psychological and social factors that affect patients, their families and health care providers (IOM, 2008). Describe the psychosocial factors you think are important in making care decisions (e.g. decisions in pursuit of treatment goals which differ from CPGs, referral to support services). How do you consider these factors? What additional psychosocial information would you like to use? Why don't you use it?
[**Guide for Probes:** In RWJ's 2011 Health Care's Blind Side Survey of 1,000 physicians they identified social factors that affect health outcomes: **inadequate housing, un-/under-employment, access barriers to transportation, food, or other neighborhood deficiencies**. Also, family factors like **family conflict** and **stress, high levels of cohesion** and **organization, good communication** are associated with T2DM regimen adherence and metabolic control (Delamater et. al., 2001).]

4. Describe the situations in which you think it is more important to consider psychosocial factors. For example, for certain clinical situations (e.g. A1c spike, certain patient populations, new patient)? Please describe specific psychosocial information considered more heavily, for specific situations. What role, if any, might psychosocial factors play for new patients, the first patient visit?
[**Guide for Probes:** Example (if needed) patient cases – Mr. A has a history of family stability and employment while Mrs. B is faced with declining cognition and stressed caregiver - can help describe circumstance when certain patient situations trigger certain treatment alternatives (Hackel, 2013).
Age – comorbid depression higher in diabetic women than men (Anderson, 2001), other factors could be: employment, housing stability, family support.]

5. How do you use this information in setting patient goals?
[Guide for Probes: Where/how do you get information on these factors (EMR)? What are some barriers to accessing this information and using it? Which are currently accessible in the medical record? To what degree do you use this info that may be in the record? What additional information is needed?]
6. Where do you get psychosocial information (specific patient, and/or patient population/groups)? What informs your insight on psychosocial factors? Is there additional information you do not access? If so, how? If not, why not? If you were training new physicians, what psychosocial factors would you tell them they should consider? In which circumstances?
[Guide for Probes: How do you know if a patient is uninsured, or experiencing low social support? How do you know if they are experiencing financial barriers to adherence? How do you know if they are experiencing stress due to neighborhood violence? How do you know if a patient may be experiencing barriers to access healthy foods? What information is currently in the medical record? What needs to be added? What are your perceptions of the accuracy of psychosocial (patient) data that is self-reported?]
7. How can we improve collection and use of psychosocial information in order to better support your care decisions? Would an index help you? How would you access and keep it current?
8. Demographics: Type of practice; Family or GP, Internal Medicine; When/where did you complete medical school? When did you complete residency? Type of residency? Where? Did you treat T2DM pts during residency? Where/how did you gather psychosocial insights gathered?
9. Is there anything else you'd like to tell me about your experience with psychosocial factors in treating adult, T2DM pts?

Appendix H

Survey Instrument

Instructions

This 10 minute survey is part of a University of Michigan health informatics study that seeks to understand and document how patient psychosocial factors influence outpatient care decisions for adult, type 2 diabetes mellitus (T2DM) patients.

Your participation in the survey will help:

- understand the psychosocial factors that inform T2DM decisions at the point of care
- enable providers and developers of health informatics capabilities (i.e. clinical decision support systems, EHRs) to more effectively capture and use psychosocial information

Demographics

Indicate your role in treating adult, type 2 diabetes (T2DM) patients in the outpatient setting.

- Physician (MD or DO)
- Nurse Practitioner (NP)
- Physician Assistant (PA)
- Registered Nurse (RN)
- Clinical Pharmacist
- Other

- I do not have experience treating adult, T2DM patients in the outpatient setting

Are you a Certified Diabetes Educator (CDE)?

- Yes
- No

What is your clinical specialty? If you do not have a specific one, indicate the one in which you have the most experience with adult, T2DM patients.

Emergency Medicine
Endocrinology
Hematology/oncology
Hospitalist
Internal medicine
Nephrology
Obstetrics/gynecology
Ophthalmology
Pathology
Pediatrics
Podiatry
Surgery
Urology
Other

(Options in Drop-down Menu)

Have you had specific, formal training (e.g. courses in professional, graduate, post-graduate school, CEUs, etc.) in treating adult, T2DM patients?

- Yes
- No

What is your age?

- Under 25 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65-74 years old
- 75-84 years old
- 85 years old or older

Indicate your gender.

- Male
- Female

Indicate your race/ethnic identity (select all that apply).

- White
- Black or African American
- Hispanic or Latino
- Asian
- Native American or Alaska Native
- Native Hawaiian or Other Pacific Islander
- Other

How much experience, not including formal clinical training, do you have treating adult, T2DM patients?

Years (Whole Number)

Months (Whole Number 1-11)

Indicate the practice setting, including formal clinical training, where you have treated adult, T2DM patients (select all that apply).

- Community Health Center
- Federally Qualified Health Center (FQHC)
- Free clinic
- Home Health / Home-based care
- Outpatient clinic of a hospital system
- Outpatient clinic of a teaching hospital
- Clinic affiliated with the Veterans Administration (VA) system
- Indian Health Services (IHS)
- A small private group practice (5 or fewer physicians)
- A large private group practice (6 or more physicians)
- Other

Have you had a formal instructor role in training other providers in the care of adult, T2DM patients (Example roles include: attending physician, instructor for CEUs, instructor for Diabetes Intensive Training Course, etc.)?

- Yes
- No

Clinical Decisions

There are 4 groups of psychosocial factors that can influence self-care behavior:

- I. Sociodemographic (e.g. financial demands, culture)
- II. Psychological (e.g. mental health status)
- III. Social relationship (e.g. social support)
- IV. Neighborhood (e.g. housing and food security)

Although psychosocial factors are currently acknowledged to affect treatment behavior, little is known about how providers consider psychosocial information as they make diabetes care decisions.

The next questions concern the circumstances when psychosocial factors may be considered, and the specific T2DM decisions that they may influence.

In which **circumstances** are psychosocial factors, as a group, important to consider when making clinical decisions for adult, T2DM patients in the outpatient setting (select all that apply)? If you believe psychosocial factors are important in **all circumstances**, select the "In all circumstances" option near the bottom of the list.

- Seeing a new patient
- Seeing a work-in patient (i.e. seeing a colleague's patient)
- Change in patient health status (e.g. spike in HbA1c, additional diagnosis)
- Patient with persistent, low treatment adherence
- Seeing a patient from low-resourced areas
- Seeing a patient with multiple chronic conditions
- Seeing a patient with a diagnosed mental health condition
- Seeing a patient with undiagnosed mental health issues
- In all circumstances
- Other

In your treatment of adult, T2DM patients in the outpatient setting, how often do psychosocial factors **influence** your decisions -- or influence your input on clinical decisions in the following areas (place mouse over the decisions for examples)?

	<i>Always</i>	<i>Often</i>	<i>Sometimes</i>	<i>Rarely</i>	<i>Never</i>	<i>N/A – I haven't made nor had input on decisions in this area</i>
<i>Target level of control</i>	<input type="radio"/>					
<i>Medications</i>	<input type="radio"/>					
<i>Making Referrals</i>	<input type="radio"/>					
<i>Other Decisions</i>	<input type="radio"/>					

For the following decisions associated with determining **level of control**, how often do psychosocial factors, as a group, **influence** these decisions -- or influence your **input** on them?

	<i>Always</i>	<i>Often</i>	<i>Sometimes</i>	<i>Rarely</i>	<i>Never</i>	<i>N/A – I haven't made nor had input on decisions in this area</i>
<i>Establish target goal for blood glucose</i>	<input type="radio"/>					
<i>Establish target goal for HbA1c</i>	<input type="radio"/>					
<i>Incorporate input from patient in setting goal</i>	<input type="radio"/>					
<i>Other Target Goal Decision(s)</i>	<input type="radio"/>					

For the following **medication** decisions, how often do psychosocial factors, as a group, **influence** these decisions -- or influence your **input** on them?

	Always	Often	Sometimes	Rarely	Never	N/A – I haven't made nor had input on decisions in this area
Select a specific medication (e.g. long acting insulin or short acting insulin)	<input type="radio"/>					
Select a brand, or a generic medication	<input type="radio"/>					
Start a patient on first oral diabetes medication	<input type="radio"/>					
Adjust oral diabetes medication dosage	<input type="radio"/>					
Add an additional (2nd, 3rd, 4th, etc.) oral diabetes medication	<input type="radio"/>					
Start a patient on injectable insulin	<input type="radio"/>					
Adjust injectable insulin dosage	<input type="radio"/>					
Start a patient on non-insulin injectable diabetes medication (e.g. GLP-1)	<input type="radio"/>					
Adjust non-insulin injectable diabetes medication (e.g. GLP-1)	<input type="radio"/>					
Reduce complexity of medication regimen	<input type="radio"/>					
Other Medication Decision(s)	<input type="radio"/>					

For the following **referral** decisions, how often do psychosocial factors, as a group, **influence** these decisions -- or influence your **input** on them?

	Always	Often	Sometimes	Rarely	Never	N/A – I haven't made nor had input on decisions in this area
Refer a patient to specialty care (e.g., endocrine, mental health, etc.)	<input type="radio"/>					
Refer a patient to support services outside the organization (e.g., social work, housing, transportation, etc.)	<input type="radio"/>					
Refer a patient to support services within the organization (e.g., social work, housing, transportation, etc.)	<input type="radio"/>					
Refer a patient to diabetes education	<input type="radio"/>					
Refer a patient to a dietitian and/or nutritional information\	<input type="radio"/>					
Other Referral Decision(s)	<input type="radio"/>					
<input type="text"/>						

For the following **recommendation** decisions, how often do psychosocial factors, as a group, **influence** these decisions -- or influence your **input** on them?

	Always	Often	Sometimes	Rarely	Never	N/A – I haven't made nor had input on decisions in this area
Make dietary recommendations	<input type="radio"/>					

<i>Make physical activity recommendations</i>	<input type="radio"/>					
<i>Recommend a patient's caregivers understand what is required of patient</i>	<input type="radio"/>					
<i>Frequency of clinical visits</i>	<input type="radio"/>					
<i>Other Recommendation Decision(s)</i>	<input type="radio"/>					

In making or informing these same decisions, how often do you feel that you have the psychosocial information that you need (**place mouse over the decisions for examples**)?

	<i>Always</i>	<i>Often</i>	<i>Sometimes</i>	<i>Rarely</i>	<i>Never</i>	<i>N/A – I haven't made nor had input on decisions in this area</i>
<i>Target level of control</i>	<input type="radio"/>					
<i>Medications</i>	<input type="radio"/>					
<i>Making Referrals</i>	<input type="radio"/>					
<i>Making Recommendations</i>	<input type="radio"/>					
<i>Other Decision(s)</i>	<input type="radio"/>					

Individual Psychosocial Factors & Sources

There are 4 groups of psychosocial factors that can influence self-care behavior:

- I. **Sociodemographic** (e.g. financial demands, culture)
- II. **Psychological** (e.g. mental health status)
- III. **Social relationship** (e.g. social support)
- IV. **Neighborhood** (e.g. housing and food security)

From the following **sociodemographic** psychosocial factors, indicate their importance in treating adult, T2DM patients (**place mouse over each factor for a description**).

	<i>Very Important</i>	<i>Important</i>	<i>Neither Important nor Unimportant</i>	<i>Unimportant</i>	<i>Very Unimportant</i>
<i>Financial Strain</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Employment</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Payor status/Type of insurance</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Culture and spirituality</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Other responsibilities</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Level of education</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Literacy</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Country of origin</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Level of English proficiency</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Sources of Sociodemographic Psychosocial Information

For the **sociodemographic** psychosocial information you indicated is **Extremely Important** or **Very Important**, select the source(s) you use to gather this information about the patient (select all sources that apply).

	<i>Patient</i>	<i>Family/ Caregivers</i>	<i>Other providers or members of the care team</i>	<i>Electronic Health Record (EHR)</i>	<i>Other – Please specify</i>	<i>No Reliable Source</i>
<i>Financial Strain</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<i>Employment</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<i>Payor status/Type of insurance</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

<i>Culture and spirituality</i>	<input type="radio"/>				
<i>Other responsibilities</i>	<input type="radio"/>				
<i>Level of education</i>	<input type="radio"/>				
<i>Literacy</i>	<input type="radio"/>				
<i>Country of origin</i>	<input type="radio"/>				
<i>Level of English proficiency</i>	<input type="radio"/>				

There are 4 groups of psychosocial factors that can influence self-care behavior:

- I. **Sociodemographic** (e.g. financial demands, culture)
- II. **Psychological** (e.g. mental health status)
- III. **Social relationship** (e.g. social support)
- IV. **Neighborhood** (e.g. housing and food security)

From the following **psychological** psychosocial factors, indicate their importance in treating adult, T2DM patients (**place mouse over each factor for a description**).

	<i>Very Important</i>	<i>Important</i>	<i>Neither Important nor Unimportant</i>	<i>Unimportant</i>	<i>Very Unimportant</i>
<i>Mental health status</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Life Stressors</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>TDM perceptions-beliefs</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Health Literacy</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Health Numeracy</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Sources of *Psychological* Psychosocial Information

For the **psychological** psychosocial information you indicated is **Extremely Important** or **Very Important**, select the source(s) you use to gather this information about the patient (select all sources that apply).

	<i>Patient</i>	<i>Family/ Caregivers</i>	<i>Other providers or members of the care team</i>	<i>Electronic Health Record (EHR)</i>	<i>Other – Please specify</i>	<i>No Reliable Source</i>
<i>Mental health status</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Life Stressors</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>TDM perceptions- beliefs</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Health Literacy</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Health Numeracy</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

There are 4 groups of psychosocial factors that can influence self-care behavior:

- I. **Sociodemographic** (e.g. financial demands, culture)
- II. **Psychological** (e.g. mental health status)
- III. **Social relationship** (e.g. social support)
- IV. **Neighborhood** (e.g. housing and food security)

From the following **social relationships/living conditions** psychosocial factors, indicate their importance in treating adult, T2DM patients (**place mouse over each factor for a description**).

	<i>Very Important</i>	<i>Important</i>	<i>Neither Important nor Unimportant</i>	<i>Unimportant</i>	<i>Very Unimportant</i>
<i>Social Support</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Threat of Violence – from abusive relationships</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Threat of Violence – from the community</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Sources of *social relationships/living conditions* Psychosocial Information

For the **psychological** psychosocial information you indicated is **Extremely Important** or **Very Important**, select the source(s) you use to gather this information about the patient (select all sources that apply).

	<i>Patient</i>	<i>Family/ Caregivers</i>	<i>Other providers or members of the care team</i>	<i>Electronic Health Record (EHR)</i>	<i>Other – Please specify</i>	<i>No Reliable Source</i>
<i>Social Support</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Threat of Violence – from abusive relationships</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Threat of Violence – from the community</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

There are 4 groups of psychosocial factors that can influence self-care behavior:

- I. **Sociodemographic** (e.g. financial demands, culture)
- II. **Psychological** (e.g. mental health status)
- III. **Social relationship** (e.g. social support)
- IV. **Neighborhood** (e.g. housing and food security)

From the following **neighborhood/community** psychosocial factors, indicate their importance in treating adult, T2DM patients (**place mouse over each factor for a description**).

	<i>Very Important</i>	<i>Important</i>	<i>Neither Important nor Unimportant</i>	<i>Unimportant</i>	<i>Very Unimportant</i>
<i>Patient's Rural/ Urban/ Suburban residence setting</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Neighborhood residence</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Housing security</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<i>Food security</i>	<input type="radio"/>				
<i>Access to transportation</i>	<input type="radio"/>				
<i>Access to places to exercise</i>	<input type="radio"/>				
<i>Literacy</i>	<input type="radio"/>				
<i>Country of origin</i>	<input type="radio"/>				
<i>Level of English proficiency</i>	<input type="radio"/>				

Sources of *neighborhood/community* Psychosocial Information

For the **neighborhood/community** psychosocial information you indicated is **Extremely Important** or **Very Important**, select the source(s) you use to gather this information about the patient (select all sources that apply).

	<i>Patient</i>	<i>Family/ Caregivers</i>	<i>Other providers or members of the care team</i>	<i>Electronic Health Record (EHR)</i>	<i>Other – Please specify</i>	<i>No Reliable Source</i>
<i>Patient's Rural/ Urban/ Suburban residence setting</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<i>Neighborhood residence</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<i>Housing security</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<i>Food security</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<i>Access to transportation</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<i>Access to places to exercise</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Accuracy

I am confident in the **accuracy** of psychosocial information I get from the following sources.

	<i>Always</i>	<i>Often</i>	<i>Sometimes</i>	<i>Rarely</i>	<i>Never</i>	<i>N/A – I haven't made nor had input on decisions in this area</i>
<i>Patient – via consultation or interview</i>	<input type="radio"/>					
<i>Patient – self-reported via Screening Tools/Forms</i>	<input type="radio"/>					
<i>Family/ caregivers</i>	<input type="radio"/>					
<i>Other providers or members of the care team</i>	<input type="radio"/>					
<i>Electronic Health Record (EHR)</i>	<input type="radio"/>					
<i>Other – please specify</i>	<input type="radio"/>					

EHR Questions

These questions concern the Electronic Health Record (EHR).

I believe the following EHR tools support the **documentation** of pertinent psychosocial information.

	<i>Always</i>	<i>Often</i>	<i>Sometimes</i>	<i>Rarely</i>	<i>Never</i>
<i>Templates</i>	<input type="radio"/>				
<i>Data Fields</i>	<input type="radio"/>				
<i>Free Text</i>	<input type="radio"/>				

I am confident in my ability to use the following EHR tools to **document** pertinent psychosocial information.

	<i>Always</i>	<i>Often</i>	<i>Sometimes</i>	<i>Rarely</i>	<i>Never</i>
<i>Templates</i>	<input type="radio"/>				
<i>Data Fields</i>	<input type="radio"/>				
<i>Free Text</i>	<input type="radio"/>				

I believe the following EHR tools support the **retrieval** of pertinent psychosocial information.

	<i>Always</i>	<i>Often</i>	<i>Sometimes</i>	<i>Rarely</i>	<i>Never</i>
<i>Templates</i>	<input type="radio"/>				
<i>Data Fields</i>	<input type="radio"/>				
<i>Free Text</i>	<input type="radio"/>				

I am confident in my ability to use the following EHR tools to **retrieve** pertinent psychosocial information.

	<i>Always</i>	<i>Often</i>	<i>Sometimes</i>	<i>Rarely</i>	<i>Never</i>
<i>Templates</i>	<input type="radio"/>				
<i>Data Fields</i>	<input type="radio"/>				
<i>Free Text</i>	<input type="radio"/>				

The EHR(s) my organization(s) use is/are (select all that apply).

ALHTA (Department of Defense)

- AllScripts
- athenaHealth
- Benchmark
- Care360
- CareCloud
- Centricity (GE)
- Cerner (PowerChart)
- E-MDs
- eClinicalWorks
- Epic (MyChart or MiChart)
- Kareo
- MedicsDocAssistant
- Meditech
- Meditouch
- Mercury Medical (CrisSoft)
- Microsoft Dynamics GP
- NueMD
- Office Practicum
- PrognoCIS
- VelociDoc (Practice Velocity)
- VistA (Veterans Administration)
- WRS Health
- An "in house" system specific to my organization which is not commercially available
- Other
- Not sure

These last 2, optional entries give you the opportunity, if you wish, to describe situations when psychosocial information influenced a specific decision, or your input on a decision.

Describe an interaction with an adult, T2DM patient in which you learned later about a psychosocial factor that **would have changed** earlier decisions, or your input in earlier decisions, regarding that patient's treatment plan.

Describe an interaction with an adult, T2DM patient in which you **modified that patient's treatment plan**, or provided input to modify the plan, because of psychosocial factors.

Use the forward button to submit all answers and complete the survey. Thank you!

Appendix I

Code Book for Physician Interviews

1. **Add'l PI Required** – “Additional Psychosocial Information Required” – expression of desire for additional psychosocial information, as it relates to making or influencing a clinical care decisions.
2. **Adherence barriers** – general barriers to self-care that are not explicitly expressed as psychosocial barriers
 - a. **Psychosocial** – barriers to self-care explicitly expressed as driven by psychosocial factors (e.g. financial barriers that prevent access to medications, neighborhood violence issues that prevent individuals from exercising).
3. **Assessing adherence** – describing *perceived* drivers of behavior that may differ from recommended self-care practices, or is inconsistent with healthy self-care behavior
4. **DM Self-Care** – various activities consistent with the recommended diabetes care regimen, including dietary habits, medication behavior, physical activity, and attending clinical appointments
5. **EHR** – references to the electronic health record (EHR), clinical record, or the record. Includes description of content of what the record contains, and how it is used
 - a. **Capture PI** – using the EHR to store psychosocial information (PI).
 - b. **Use of PI** – using EHR to document or use psychosocial information (PI)
 - c. **Accuracy of info capture** – perspectives on the accuracy of information captured in the EHR.
 - d. **Differences in inpatient v outpatient** – references to differences in capturing, or using, health information in the inpatient and outpatient setting. Includes references to information entered by other providers associated with inpatient or outpatient care (e.g. outpatient notes)
 - e. **EHR Barriers to Capture PI** – describing circumstances or situations when barriers to capture psychosocial information in the EHR are encountered
 - f. **Improving EHR in PI capture and use** – describing improvements to the EHR to better facilitate the capture and use of psychosocial information
6. **How decisions are made** – general references to how clinical care decisions are made, considering psychosocial factors. Includes influencing clinical decisions.
 - a. **Decisions** – references to specific clinical decisions, include medications, referrals (e.g. social work/social support, specialty care), recommendations (diet, physical activity, etc.)
 - b. **DM guidelines** – references to clinical decisions considering diabetes guidelines, for HbA1c or fasting blood sugar (FBS)
 - c. **New Patients** – describing making clinical decisions for new patients, specifically patients that the interview participant has not treated but may not be new to the clinical site and/or healthcare system
 - d. **Overtreatment concerns** – decisions made considering “too much” care, overtreatment

- e. **Risk-Life Expectancy** – reference to making clinical decisions considering risk, including life expectancy of the patient
 - f. **Pt. Engagement** – describing making clinical decisions purposively and intentionally including direct input from the patient.
 - g. **Newly diagnosed** – making clinical decisions for patients newly diagnosed with diabetes
7. **Limited Clinical Resources** – references to low availability of clinical resources, including time, for the interview participant or for other members of the care team (e.g. nurses who may not have time for additional activities, increasing patient caseload that strains resources)
8. **PFs** – general references to psychosocial factors
- a. **Social support** – reference to social isolation, social connections, support includes four dimensions: appraisal support, informational support, instrumental support and emotional support (Funnell, 2010)
 - b. **Social Support NEGATIVE** – references to aspects of patient’s social network that may act as barriers to healthy self-care activities, or overall wellness
 - c. **Health Literacy** – reference to measure of patients’ ability to read, comprehend, and act on medical instructions (Al Sayah, Williams, & Johnson, 2013; Schillinger, Grumbach, Piette, Wang, Osmond, Daher, Diaz Sullivan, et al., 2002)
 - d. **Literacy** – reference to the ability to use printed and written information to function in society, to achieve one’s goals, and to develop one’s knowledge and potential (Institute of Education Sciences, 2014)
 - e. **Employment** – reference to job demands that may influence self-care (e.g. work hours, type of job, ability to take time off for self-care)
 - f. **Financial Stressors** – references to patient’s lack of resources that impact access to food, safe housing, transportation, or medications
 - g. **Payor status** – reference to a patient’s insurance coverage, type of coverage, private insurance, government health insurance (Medicare, Medicaid, Military, State-specific plans, Indian Health Service) (U.S. Census Bureau, 2014)
 - h. **Immigrant status** – reference to a patient, or group of patients, who may not be documented U.S. citizens
 - i. **Culture** – reference to cultural norms and traditions which include dietary practices, faith beliefs, and practices (Kittler & Sucher, 1995b)
 - j. **Transportation** – reference to barriers which can lead to missed appointments, missed or delayed medication use (Syed et al., 2013)
 - k. **Violence** – reference to perceived patient perceiving threat of violence caused by violence-inducing or violence-protecting conditions (Sampson et al., 2005)
 - l. **English proficiency** – reference to patient’s ability to understand and speak English
 - m. **Neighborhood** – reference to patient’s residency setting, including physical aspects of a neighborhood that may influence a patient’s ability to purchase products (food), enable mobility, and interact and informally monitor another’s behavior (D. A. Cohen et al., 2003)

- n. **Access to Healthy Food** – reference to access to fresh, healthy, and affordable food (Walker et al., 2010)
- o. **Importance of Psychosocial Info** – description of general importance of psychosocial information
- p. **Mental health** – reference to patient’s appearance; manner and approach; orientation, alertness, and thought processes; mood and affect (Sharma et al., 2004)
- q. **Stress** – reference to negative patient’s events, chronic strains, traumas (Thoits, 2010)
- r. **DM perceptions-beliefs** – description of patient perceptions of the relative quality-of-life effects of complications and treatments (Huang et al., 2007)
- s. **Education** – reference to patient’s level of formal schooling
- t. **Activities of daily living** – reference to patient’s living situation and/or demands that may impede self-care activities (e.g. cooking, shopping, caring for children)
- u. **Rural-Urban** – reference to patient’s residency setting, that may influence health care utilization or access to care (Spoont et al., 2011)
- v. **Health numeracy** – reference to degree to which individuals can obtain, process, and understand the basic quantitative health information and services they need to make appropriate health decisions (Al Sayah et al., 2013)
- w. **Faith** – reference to patient’s faith that may influence self-care activities, and/or outlook
- x. **Housing security** – reference to stable housing, access to affordable, safe housing (Johns Hopkins Center to Eliminate Cardiovascular Health Disparities, 2014b)
- y. **Food security** – reference to access to fresh, healthy, and affordable food (Walker et al., 2010)
- z. **Violence-Domestic** – reference to a pattern of coercion, physical abuse, sexual abuse, or threat of violence in personal relationships (Krug, 2002)
- 9. **Psychosocial Index** – reference to idea of development and use of a psychosocial index, to measure an individual’s psychosocial “health”, much like a Beck scale used for mental health/depression
 - a. **Pros** – affirmative comments on the development and/or use of a psychosocial index to inform clinical decisions
 - b. **Cons** – negative comments on the development and/or use of a psychosocial index to inform clinical decisions
 - c. **When used** – comments on when a psychosocial index would be used
 - d. **How used** – comments on how a psychosocial index would be used to inform clinical decisions
 - e. **Items for Index** – comments on what a psychosocial index should include and/or incorporate
- 10. **Pt. goals** – general comments concerning patient goals as they pertain to the diabetes care regimen
 - a. Goal setting – references to setting specific goals
 - b. Negotiating pt goals – references to negotiating goals with patients

11. **Pt population** – general comments about patient population currently served, or recently served
 - a. Complexity – comments concerning complexity of a patient population
 - b. Comorbidity – comments concerning comorbid conditions of a patient population
12. **Pt preferences** – comments concerning patient preferences
13. **Pt Story** – references to the importance of understanding the patient’s situation and/or circumstances
14. **Source of insights on importance of PFs** –general comments on the source of insights on the importance of psychosocial factors influencing self-care and/or outcomes
 - a. **Clinical experience** – reference to clinical experience providing insights on the importance of psychosocial factors influencing self-care and/or outcomes
 - b. **Literature** – reference to published literature providing insights on the importance of psychosocial factors influencing self-care and/or outcomes
 - c. **Medical Training** –reference to the physician’s medical training, including residency, on the importance of psychosocial factors influencing self-care and/or outcomes
15. **Source of PI** – reference to the general sources of psychosocial information at it pertains to clinical decisions
 - a. **Pt-Doc Relationship** – reference to the patient-doctor relationship being a key driver in the source of psychosocial information
 - b. **Assessing PI** – assessing the accuracy of psychosocial information
 - c. **Barriers to access PI** – reference to barriers to access psychosocial information
 - d. **Other providers** – reference to other members of the care team as sources of psychosocial information
 - e. **Caregivers** – reference to caregivers, including family members, as sources of psychosocial information
 - f. **EHR** – reference to the EHR as a source of psychosocial information
 - g. **Home visit** – reference to home visits as a source of psychosocial information
 - h. **Ideas to improve capture of PI** – description of ideas to improve the capture of psychosocial information
16. **Training residents or med students** – comment on training residents or medical students on the importance of psychosocial information in making clinical decisions
17. **Type of clinical practice setting** – reference to type of clinical practice setting (e.g. community clinic, federally qualified health center)
18. **When PFs Considered** – reference to what circumstances and/or situations trigger the consideration of psychosocial factors

Appendix J

Principles of Survey Instrument Design

I asked two types of questions: 1) *nonsensitive* questions about behavior and possibly 2) *attitude* questions (Bradburn, Sudman, & Wansink, 2004). First, questions about behavior concerned *what* psychosocial factors (PFs) providers consider and during *which* situations (SFs) these factors are considered. As stated in Groves et al. (2011), I followed these guidelines concerning these types of (nonsensitive) behavior questions (p. 243):

1. With closed questions, include all reasonable possibilities as explicit response options
2. Use words that virtually all respondents will understand
3. Lengthen the questions by adding memory cues to improve recall
4. When forgetting is likely, use aided recall

Since I included questions about attitudes—common in survey methodology—I followed Groves et al. (2011) selected guidelines concerning designing questions soliciting attitudes (p. 248):

1. Avoid double-barreled questions
2. Measure the strength of the attitude, using separate items
3. Use bipolar items, except when they might miss important information
4. Carefully consider alternatives provided, as they influence the answers
5. Ask the general question first when asking general and specific questions about a topic

The first four guidelines concern question *wording*. Following these guidelines makes interpretation consistent across respondents. Double-barreled questions ask about two attitudes simultaneously. I sought attitudes about the two characteristics which are generally solicited via surveys, direction (affirmative or negative) and intensity (weak or strong). Assessing the direction is fairly straightforward; however, in soliciting strength I followed a summated rating scale (“strongly disagree” to “strongly agree”). I used a Likert scale, and referred to the literature on the granularity needed—and the interpretation of the (ordinal) data—prior to finalizing the survey instrument (Ogden & Lo, 2012; Spector, 2004; Tastle & Wierman, 2006).

The last two guidelines reduce influence due to question ordering. General questions should precede more specific questions on similar topics. When asking questions about a specific topic (e.g., the influence of *spousal* support) respondents can show bias in subsequent, more general questions (e.g. the influence of *family* support). In this example, the question about *family* support should appear before the question about *spousal* support.

Appendix K

Average Likert Scores of Psychosocial Factors

Complete list of the 23 psychosocial factors I investigated in the survey instrument, listed by highest to lowest average score in the Likert scale.

Average Likert Scores of Individual Psychosocial Factors				
	Total (<i>n</i> = 164)	Primary Care Physicians (<i>n</i> = 36)	NP & Diabetes Educators (<i>n</i> = 128)	<i>p</i> value
Financial Strain	4.84 (.383)	4.69 (.525)	4.88 (.323)	.009
Mental Health Status	4.62 (.556)	4.28 (.701)	4.73 (.465)	.001
Life Stressors	4.57 (.576)	4.25 (.649)	4.66 (.522)	.000
Food Security	4.55 (.633) _a	3.88 (.729) _b	4.74 (.460) _c	.000
Social Support	4.53 (.572) _a	4.20 (.678) _d	4.62 (.504) _e	.000
Health Literacy	4.53 (.580)	4.14 (.683)	4.64 (.498)	.000
T2DM				
Perceptions/Beliefs	4.52 (.660)	4.06 (.715)	4.65 (.583)	.000
Access to Transportation	4.50 (.664) _a	3.94 (.851) _b	4.65 (.512) _c	.000
Threat of Violence - From Abusive Relationship(s)				
Literacy	4.48 (.810) _a	4.03 (1.014) _d	4.60 (.696) _e	.000
Health Numeracy	4.47 (.650)	4.11 (.785)	4.57 (.571)	.000
Health Numeracy	4.44 (.695) _f	4.14 (.810) _b	4.52 (.639)	.004
Employment Status	4.39 (.678)	4.25 (.770)	4.43 (.648)	.161
Payor Status	4.36 (.775)	4.22 (.866)	4.40 (.746)	.229
Threat of Violence - From Community	4.35 (.880) _a	3.83 (1.124) _d	4.50 (.738) _e	.002
Housing Security	4.26 (.791) _a	3.62 (.922) _b	4.44 (.653) _c	.000
Other responsibilities	4.24 (.766)	3.75 (.731)	4.38 (.721)	.000
Access to places to exercise	4.19 (.748) _a	3.85 (.892) _b	4.28 (.679) _c	.003
Culture and Spirituality	4.17 (.782) _f	3.60 (.881) _d	4.33 (.677)	.000
Level of English Proficiency	4.15 (.764) _f	3.92 (.874)	4.21 (.720) _g	.040
Level of Education	4.12 (.725)	3.94 (.674)	4.17 (.733)	.084
Patient's Rural/Urban/ Suburban residence setting	4.11 (.846) _a	3.73 (.963) _b	4.21 (.786) _c	.004
Neighborhood Residence	4.01 (.787) _a	3.62 (.954) _b	4.12 (.703) _c	.006
Country of Origin	3.55 (1.00) _f	3.25 (.996)	3.64 (.989) _g	.040

Note. Respondents were asked to indicate the importance of psychosocial factors in making, or providing input into, diabetes care clinical decisions. Responses were captured in a Likert scale: 5 – Very Important, 4 – Important, 3 – Neither Important nor Unimportant. 2 – Unimportant, 1 – Very Unimportant. Standard deviations listed in parentheses.

^a *n* = 159. ^b *n* = 34. ^c *n* = 125. ^d *n* = 35. ^e *n* = 124. ^f *n* = 163. ^g *n* = 127.

Appendix L

Average Likert Scores of Psychosocial Factors by Group

Survey respondents indicate that *psychological* psychosocial factors has the highest average score on the Likert scale among the four groups of psychosocial factors. As shown in the table below – Average Likert Scores of Psychosocial Factors by Group, *social relationships and/or living conditions* has the next highest average score. *Neighborhood and community* psychosocial factors is next, by a very slight margin more than *sociodemographic* psychosocial factors.

Average Likert Scores of Psychosocial Factors by Group				
	Total (<i>n</i> = 164)	Primary Care Physicians (<i>n</i> = 36)	Nurse Practitioners & Diabetes Educators (<i>n</i> = 128)	<i>p</i> value
Psychological	4.54 (.510)	4.18 (.591)	4.64 (.434)	.000
Social Relationships / Living Conditions	4.45 (.672)	4.02 (.832) ^a	4.58 (.566) ^b	.001
Neighborhood/ Community	4.27 (.599)	3.77 (.772) ^c	4.41 (.458) ^d	.000
Sociodemographic	4.26 (.464)	3.97 (.527)	4.34 (.414)	.000

Note. Respondents were asked to indicate the importance of individual psychosocial factors in making, or providing input into, diabetes care clinical decisions. Responses were totaled by group. Responses were captured in a Likert scale: 5 – Very Important, 4 – Important, 3 – Neither Important nor Unimportant, 2 – Unimportant, 1 – Very Unimportant. Standard deviations listed in parenthesis.

^a *n*=35. ^b *n* = 124. ^c *n* = 34. ^d *n* = 125.

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