

©Copyright 2013
Caroline L. Spice

Primary Care Providers' Perspective on the Inclusion of Behavioral Risk Measures in the
Electronic Health Record for Patient Engagement of Individuals with Multiple Chronic
Conditions

Caroline L. Spice

A thesis
submitted in partial fulfillment of the
requirements for the degree of

Master of Science

University of Washington

2013

Committee:
George Demiris
Huong Nguyen
Charles Mayer

Program Authorized to Offer Degree:
School of Nursing

University of Washington

Abstract

Primary Care Providers' Perspective on the Inclusion of Behavioral Risk Measures in the Electronic Health Record for Patient Engagement of Individuals with Multiple Chronic Conditions

Caroline L. Spice

Chair of the Supervisory Committee:
George Demiris, Professor
Department of Biobehavioral Nursing and Health systems

The Society of Behavioral Medicine issued a policy statement supporting inclusion of a “core set of behavioral and psychosocial measures in EHRs” in 2011. The core set of 17 screening measures cover nine domains: anxiety and depression, eating patterns, physical activity, quality of life, risky drinking, sleep quality, stress, substance use, and tobacco use. Given the complex relationship between multiple modifiable risk behaviors and multimorbidities, this information may be valuable for patient engagement purposes within the primary care setting. Addressing modifiable risk behaviors may facilitate positive health outcomes for individuals with multimorbidities; and, since care coordination for most patients with multimorbidities as well as assessment and counseling for modifiable risk behaviors occur in the primary care setting, primary care appears to be the most appropriate location to collect and use risk behavior information. However, primary care settings are currently under-resourced and lack sufficient time for additional initiatives. The aim of this study is to illuminate, through qualitative research methods, primary care providers’ perspective to the Society of Behavioral Medicine’s recommendation of including risk behaviors into the electronic health record (EHR).

A secondary aim was to learn how information about these risk behaviors within an EHR might effectively be utilized within a primary care setting. Through individual one on one interviews, we learned that primary care providers acknowledge the importance of risk behaviors in general, and support many of the specific questions that is recommended. And though there is general acceptance for the Society's recommendation, many providers expressed caution in advancing a directive towards including these measures currently into the EHR. Concerns about data collection and retrieval of information from an EHR, complex dynamics of decision making related to these risk behavior measures, and the level of patient engagement that is needed, led many providers to counsel against mandating the inclusion of these risk behaviors into the EHR at this time based on five themes that emerged from this analysis: constriction on providers' time, importance of risk behavior information, balancing disease management with the patient's illness narrative, technology's contribution to care, and regulatory perspective.

TABLE OF CONTENTS

LIST OF TABLES	iv
Chapter 1: Introduction	1
Chapter 2: Background	4
Growing Prevalence and Impact of Multiple Chronic Conditions in Primary Care	4
Addressing Complex Patients in Primary Care Settings	6
Electronic Health Record Expansion in Primary Care	8
Challenges with Primary Care Provider Schedules	11
Summary and the Challenge Ahead	16
Chapter 3: Methods	18
Participants	18
Questions	20
Risks	22
Analytic Process	22
Chapter 4: Results	24
Themes	25
Constriction of Primary Care Providers' Time	28
Importance of Collecting Risk Behavior Information	30
Limitations of current data collection process	37
Balancing Disease Management with Illness Narrative	40
Technology's Contributions	48
Technology as a barrier	48
Technology as a facilitator	51
Technology as potential partner	52
Regulatory Perspective	57
Chapter 5: Discussion	65
Limitations	70
Conclusion	71
References	73

LIST OF TABLES

Table 1. <i>Summary of Chronic Disease Prevalence and Annual Costs by Age Group</i>	5
Table 2. <i>Risk Behavior Domains and Questions</i>	10
Table 3. <i>Provider Characteristics</i>	24

Acknowledgements

The author would like to gratefully acknowledge the members of the committee, individually and collectively, George Demiris, PhD, Huong Nguyen, RN, PhD, and Charles Mayer, MD, MPH, for being a beacon of scholarship and a steady keel in this research. In addition, sincere appreciation to Jean Cawse-Lucas, MD, Robert Smithing, NP, FAANP, Nancy Lawton, NP, Grace Grymes-Chapman, NP, and their respective organizations, the King County Academy of Family Physicians, ARNPs United of Washington State, and the Puget Sound Nurse Practitioner Association as well as the Board of the King County Academy of Family Physicians for their encouragement of this research; and to Sarah Philp, MD, and Sara Thompson, MD for their support.

Lastly, deepest appreciation for the providers who participated in this research, this thesis would not have been possible without your important thoughts and perspectives.

Dedication

To Mark and Galen,

You enrich my narrative.

Chapter 1: Introduction

In 1993, McGinnis and Foege published a seminal article uncovering the actual causes of death for 50% of all deaths in the United States in 1990. Their article cite the top three contributors to mortality as tobacco use (an estimated 400,000 deaths), poor diet and physical inactivity (300,000), and alcohol consumption (100,000), all modifiable risk behaviors. Their findings were consistent with epidemiological studies from the 1920s through the 1960s which demonstrated that behavioral factors largely determine the pattern of disease and premature mortality for 20th century populations in most industrialized nations (Breslow, 1998). In 2004, Mokdad, Marks, Stroup, and Gerberding published an update to McGinnis and Foege. They noted relatively minor changes from 1990 to 2000 though the most striking finding was the substantial increase in the number of estimated deaths due to poor diet and physical inactivity. The gap between deaths due to smoking (435,000) and deaths due to poor diet and physical inactivity (400,000) had narrowed substantially; portending a trend that poor diet and physical inactivity would overtake tobacco as the leading preventable cause of mortality. In both studies, illicit drug use contributed least to the actual causes of deaths at 20,000 and 17,000, in 1993 and 2000, respectively.

Since the publication of this seminal article, additional modifiable risk behaviors continue to be explored that impact the health and well-being of individuals. Current research is beginning to shed light on the effect that poor quality sleep may have on adult and adolescent health (A. M. Landis & Parker, 2007; A. M. Landis, Parker, & Dunbar, 2009; C. A. Landis, 2002; C. A. Landis, Savage, Lentz, & Brengelmann, 1998), while the relationship between a person's stress and anxiety level, and health remains undeniable. Many of these modifiable risk

behaviors lead to multiple chronic conditions which lead to greater overall healthcare utilization, increased cost for patients and society, and additional hospitalizations and poorer outcomes in the event of a hospitalization.

The prevalence and health effects of many of these modifiable risk behaviors and their relationships to multiple chronic conditions are well known to many primary care providers. These effects include greater care coordination challenges for providers of patients with multiple chronic conditions, increased surveillance of multiple drug regimens for patients with multiple chronic conditions, and additional challenges in complying with sometimes competing clinical practice guidelines which do not specifically address patients with multiple chronic conditions.

In addition, risk behaviors tend to cluster together. Fine et al. (2004) found that more than 50% of the U.S. population had two or more of the risk behaviors mentioned so far. The complex relationship and interactions between multiple risk behaviors and multiple chronic conditions pose tremendous challenges for all healthcare providers (Feinstein, 1970; Valderas, Starfield, Sibbald, Salisbury, & Roland, 2009). It is apparent that risk behaviors have a broad and central role in health (Fisher et al., 2011) and that healthcare providers are impacted by and have an impact on their patients' risk behaviors.

To address these challenges, the Society of Behavioral Medicine (the Society) has recommended inclusion of a "core set of behavioral and psychosocial measures" in the electronic health record (EHR) for every patient (Society of Behavioral Medicine, 2010; Society of Behavioral Medicine, 2011). With the recently encouraged adoption of EHRs in healthcare, the ability to harness this technology to address these modifiable risk behaviors may be possible. However the implications of implementing this policy recommendation, the benefits, barriers,

challenges, and unintended consequences from the providers' perspective, require study and are the subject of this thesis.

Chapter 2: Background

Growing Prevalence and Impact of Multiple Chronic Conditions in Primary Care

According to the Centers for Medicare and Medicaid Services recent chart book, *Chronic Conditions Among Medicare Beneficiaries*, two-thirds of 20.7 million beneficiaries had at least two or more chronic conditions (Center for Medicare & Medicaid Services, 2011). Beneficiaries with six or more conditions account for one-half of Medicare spending on hospitalizations and 12% of these beneficiaries accounted for 43% of Medicare spending. Marengoni (2011) showed that as high as 98% of the elderly population have multiple chronic conditions, also known as multimorbidities. Though comorbidity is when an index condition and other apparently unrelated conditions occur simultaneously, and multimorbidity is when no one condition is identified as an index condition (Starfield, 2006), the term multimorbidity will be used to refer to both of these situations from this point forward.

Also, though multimorbidity generally increases with age, van den Akker (1998) found that multimorbidities are a frequent phenomenon of all ages. Challenges of multimorbidity are prevalent in individuals who are less than 65 years old (Fortin, Stewart, Poitras, Almirall, & Maddocks, 2012). By one account, more than one in four Americans have multiple chronic conditions that account for about two-thirds of total US health care spending (Anderson, 2010). The US Department of Health and Human Services' recently published initiative on the challenges of multiple chronic conditions underscores the importance of addressing this growing problem (US Department of Health and Human Services, 2010).

In addition to its growing prevalence, multimorbidity has financial implications as well as treatment challenges which impact the patient's degree of disease burden. As shown in the table

below, mean expenditures of Medicare beneficiaries with more than one chronic condition doubled with each additional chronic condition (Wolff, Starfield, & Anderson, 2002), while mean expenditures for beneficiaries with four or more chronic conditions were triple of those with three chronic conditions. Individuals with two or more chronic conditions account for 95% of Medicare expenditures.

Table 1. Summary of Chronic Disease Prevalence and Annual Costs by Age Group
(taken from Wolff, et al., 2002)

No. of Chronic Conditions*	Age Group, y										Total	
	65-69		70-74		75-79		80-84		≥85		% Beneficiaries	Mean Expenditures, \$
	% Age Group	Mean Expenditures, \$	% Age Group	Mean Expenditures, \$	% Age Group	Mean Expenditures, \$	% Age Group	Mean Expenditures, \$	% Age Group	Mean Expenditures, \$		
0	25.7	195	18.9	203	15.2	205	12.6	222	12.2	303	18.0	211
1	20.4	999	18.0	1073	16.0	1175	14.9	1271	15.0	1579	17.3	1154
2	22.2	2055	22.5	2186	21.6	2348	20.9	2677	21.0	3284	21.8	2394
3	16.0	4227	18.7	4328	19.9	4597	20.4	4997	20.4	5929	18.8	4701
≥4	15.7	14 109	21.9	13 774	27.3	13 857	31.2	13 975	31.4	14 282	24.1	13 973
Overall age group	100.0	3609	100.0	4548	100.0	5424	100.0	6160	100.0	6660	100.0	5015

*Mean number of chronic conditions for age groups were as follows: 65-69 years, 1.88; 70-74 years, 2.25; 75-79 years, 2.52; 80-84 years, 2.71; ≥85 years, 2.71; and total group, 2.34.

Also, the limited degree to which multimorbidities are present in populations taking part in randomized controlled clinical trials, and its limited recognition by trial investigators (Fortin et al., 2006; Smith, Soubhi, Fortin, Hudon, & O'Dowd, 2012) suggests that patient's response to interventions may be highly variable when applied to individuals with multiple chronic conditions (Starfield, 2006). Multimorbidities can result in treatment challenges in that most clinical practice guidelines (CPG) do not take applicability of older patients with multimorbidities into account (Nardi et al., 2007). In addition, a recent review found that

adhering to current CPGs in caring for older patients with multimorbidities may have undesirable effects (Boyd et al., 2005), and individual medications may be less beneficial or even harmful when taken along with other medications by patients with multimorbidities (Tinetti, Bogardus, & Agostini, 2004). Lastly, a recent review of current CPGs show that they do not provide explicit guidance on treatment of patients with multimorbidities (Lugtenberg, Burgers, Clancy, Westert, & Schneider, 2011).

Finally, though the most common approach to measure multimorbidity is by disease counts (Huntley, Johnson, Purdy, Valderas, & Salisbury, 2012), Bayliss et al. (2012) found that comprehensive assessment of morbidity requires subjective and objective measures. In self-report of morbidity by individuals with multiple chronic conditions who are 65 years old and above, ICD-9 based morbidity index did not contribute significantly to one's disease burden (Bayliss, Ellis, & Steiner, 2009). Self-care management of one's multimorbidity results in various trade-offs and challenges for patients (Guralnik, 1996; Schoenberg, Bardach, Manchikanti, & Goodenow, 2011; Schoenberg, Leach, & Edwards, 2009; Tinetti et al., 2008; Verbrugge, Lepkowski, & Imanaka, 1989). Also, many primary care practitioners' definition of patient complexity includes medical, social, and behavioral factors such that physician defined patient complexity only modestly agreed with three morbidity algorithms that are based on select diagnoses and age (Grant et al., 2011). Multimorbidity alone does not reflect the patient care and illness burden complexity inherent in many patients (Nardi, et al., 2007).

Addressing Complex Patients in Primary Care Settings

As a model of care, primary care has been maintained as the fundamental setting for organizing care for patients with chronic illness, albeit re-designed around the patient as opposed

to the practice (Bodenheimer, Wagner, & Grumbach, 2002a, 2002b; Wagner, Austin, & Von Korff, 1996). A recent review of the literature affirm the appropriateness of primary care as the setting for coordinating care for most patients (Stille, Jerant, Bell, Meltzer, & Elmore, 2005).

Given the burden of multimorbidity and concurrent risk behaviors, patients have complex care needs (Stange et al., 1998). Hence, the important role of primary care within the healthcare system is highly valued. The majority of providers who care for both the indexed condition and other conditions are primary care providers (Starfield et al., 2003). In addition, 113 of every 1000 people visit their primary care provider each month (Green, Fryer, Yawn, Lanier, & Dovey, 2001) and primary care visits account for more than 50% of all office visits annually (American Academy of Family Physicians, 2004). Also, since most adult patients with multimorbidities are managed in primary care clinics (Hing, Cherry, & Woodwell, 2006), and over half of an average of three visits per year are with primary care physicians (Cherry & Woodwell, 2002), responsibility of caring for all patients fall principally on primary care providers.

Primary care has also been emphasized as the most appropriate setting for the assessment and management of multiple behavioral risk factors (Pronk, Peek, & Goldstein, 2004). In addition to its reach and frequency of visits, patients state that primary care clinicians are expected sources of preventive health information and recommendations for patients; and between 92% to 98% of adult members of a health maintenance organization expected advice and help from their healthcare system in key behaviors such as diet, exercise, and substance use (Whitlock, Orleans, Pender, & Allan, 2002). Also, because of their central role in coordinating healthcare, primary care practitioners can directly influence and support a patient's decision to initiate change (O'Connor, Rush, Prochaska, Pronk, & Boyle, 2001). A review of the feasibility

of screening and health risk appraisal of four behavioral risk factors (smoking, alcohol misuse, physical inactivity, and unhealthy diet) led to a recommendation that these behavioral risk factors be integrated into physical examinations and in primary care illness visits (Babor, Sciamanna, & Pronk, 2004).

Due to the complexity of patients who present to primary care and its principal role in coordinating care and behavioral counseling, the Robert Wood Johnson Foundation developed the Prescription for Health: Promoting Healthy Behaviors in Primary Care Research Networks (PBRN). The aim of the program was “to identify, test, and evaluate practical and evidence-based tools, cues, and techniques to improve the delivery and effectiveness of health behavior change strategies in routine primary care practice” (Cifuentes et al., 2005). Though the PBRNs were successful in confirming the feasibility of health behavior counseling in primary care settings, it also highlighted the need for substantive practice redesign (Cifuentes, et al., 2005) and the potential sustainability of an intervention (Cohen, Tallia, Crabtree, & Young, 2005). The experiences of the PBRNs have broad implications for the challenges of integrating behavioral risk measures into the EHR.

Electronic Health Record Expansion in Primary Care

Though the administrative and clinical challenges in addressing their patient’s healthcare needs led early adopters toward the use of EHRs, the Health Information Technology for Economic and Clinical Health (HITECH) provisions of the American Recovery and Reinvestment Act of 2009 have stimulated acceptance and adoption of EHRs into clinical practice more rapidly than in previous years (Blumenthal, 2011; The Physicians Foundation, 2008, 2012). Through the HITECH provisions, eligible providers can receive incentive

payments if they show “meaningful use” of EHRs (Blumenthal, 2010). To demonstrate “meaningful use” of EHRs, eligible providers are required to capture and report on a number of clinical quality measures (Blumenthal & Tavenner, 2010). One such measure is collection of “smoking status for patients who are 13 years old or older.” And because smoking status has been demonstrated to have a significant impact on an individual’s health and wellbeing (McGinnis & Foege, 1993; Mokdad, Marks, Stroup, & Gerberding, 2004), collecting this information is considered a core measure within the definition of “meaningful use” of EHRs.

Because of their ability to amass and process greater amounts of information, EHRs have the potential to support and improve providers’ patient care efforts. In fact, the potential to harness this technological advantage prompted the Society of Behavioral Medicine (the Society) to recently issue a policy statement supporting inclusion of a “core set of behavioral and psychosocial measures in EHRs” (Society of Behavioral Medicine, 2010; Society of Behavioral Medicine, 2011). The Society of Behavioral Medicine is a multidisciplinary organization of prominent and widely published clinicians, educators, and scientists who are “dedicated to promoting the study of the interactions of behavior with biology and the environment, and the application of that knowledge to improve the health and well being of individuals, families, communities and populations” (Society of Behavioral Medicine, 2013). They encourage better health through behavior change. The nine domains which the Society recommends for inclusion into the EHR are: anxiety and depression, eating patterns, physical activity, quality of life, risky drinking, sleep quality, stress, substance use, and tobacco use. The measures and the corresponding nine domains are listed below.

Table 2. Risk Behavior Domains and Questions

Eating Patterns	Over the past 7 days: a. How many times a week did you eat fast food or snacks or pizza? b. How many servings of fruits/vegetables did you eat each day? c. How many soda and sugar sweetened drinks (regular, not diet) did you drink each day?
Physical Activity	How many days of moderate to strenuous exercise, like a brisk walk, did you do in the last 7 days? b. On those days that you engage in moderate to strenuous exercise, how many minutes, on average, do you exercise at this level?
Risky Drinking	How many times in the past year have you had X or more drinks in a day? (where X is 5 for men and 4 for women)
Smoking/Tobacco use	Have you used tobacco in the last 30 days? Smoked cigarettes: Yes/No Smokeless tobacco product: Yes/No
Substance Use	How many times in the past year have you used an illegal drug or used a prescription medication for non-medical reasons?
Anxiety and Depression	Over the past 2 weeks have you been bothered by these problems? (Leichert scale: not at all, several days, more days than not, early every day) a. Feeling nervous anxious, or on edge b. Not being able to stop or control worrying c. Feeling down, depressed, or hopeless d. Little interest or pleasure in doing things
Stress	Please circle the number (0-10) that best describes how much distress you have been experiencing in the past week including today.
Sleep	Do you snore or has anyone told you that you snore? In the past 7 days, I was sleepy during the daytime. never, rarely, sometimes, often, always
Quality of Life	Would you say that in general your health is excellent, very good, good, fair, or poor?

However, limited data exist on how the collection of expanded behavioral health measures may impact primary care workflow settings that are already over burdened. In addition, given the current priorities within primary care, it is unclear to what extent this information can be efficiently used to deliver effective services.

Challenges with Primary Care Provider Schedules

One of the challenges to integrating behavioral risk measures into an EHR is the primary care providers' limited time. How would all 17 measures for the nine domain areas be implemented given the current constraints on provider time? Baron (2010) recently detailed the work performed in one clinic with an EHR which resulted in a 50-60 hour work week for each physician. Also, as email technology has been embraced throughout the general population, this communication format has also become more important to all provider practices. For instance, the number of consultation request emails that a pediatric gastroenterology practice processed between 1995 and 1998 averaged around 37.6 emails per month (Borowitz & Wyatt, 1998) for two practitioners compared to the current average of 16.8 emails per day by a provider in 2010 (Baron, 2010)

Additionally, though Flocke (2001) and Beasley (2004) report that primary care physicians already manage an average of approximately three problems per encounter, a more recent analysis of the National Ambulatory Medical Care Survey found that even though the visit duration from 1997 to 2005 increased from 18.0 minutes to 20.9 minutes, the number of clinical items addressed per visit increased from 5.4 to 7.1 items during the same time period; this results in a decrease in the amount of time that is spent on each clinical item from 4.4 minutes to 3.8 minutes (Abbo, Zhang, Zelder, & Huang, 2008). Also, on a per hour basis, a primary care

practice visit is 33% more complex relative to cardiology visits and five times more complex relative to psychiatry visits (Katerndahl, Wood, & Jaen, 2010, 2011).

Based on the limited time and resources that currently exist within many primary care practices, absorbing additional tasks or responsibilities may over burden an already taxed system. In fact, the process of implementing an EHR, which is meant to reduce administrative burden and enhance clinical care, already poses additional challenges to workflow. The practical implications of migrating to an EHR are considerable (Baron, Fabens, Schiffman, & Wolf, 2005). In addition, a relatively recent implementation study of nine practices in three geographic clusters found that most EHRs in these practices to be so inflexible that it was difficult to insert additional risk behavior screening questions within the record's vital signs section (Aspy et al., 2008). Though this study's small sample size is a major limitation, it also suggested that practices were unable to add more than two risk behavior screenings and continue to increase screening for two initial risk behaviors. Maintenance of the implementation after the study period was not sustained.

Even prior to EHR adoption, attempts to administer formal Health Risk Assessment (HRA) tools have had limited success in primary care settings. Though health history questionnaires are routinely used in primary care, the formal and comprehensive HRAs that encompass 30-40 measures and which uses epidemiologic data to generate quantitative estimates of morbidity and mortality, are probably not administered but rather shorter and more limited tools are actually used (Dickey, Gemson, & Carney, 1999). Even though the HRA has become commonplace in a broad spectrum of programs and activities designed to influence individual health behavior for more than 30 years (DeFriese & Fielding, 1990), the time and

resource requirements needed to administer HRAs are limited in most primary care settings. These data collection tools also need to be leveraged by successful teamwork (Dickey, et al., 1999; McDonald, March 2012).

In a survey of 369 physician organizations, Bellows, McMenamin, & Halpin (2010) found that the majority (67%), did not routinely administer an HRA during their final survey period, 2006-2007. Also, because traditional sources of information about clinical services and health status such as medical records and claims data are not adequate for outcomes research, a study to determine feasibility of front office personnel's distribution of a patient self-administered 41 item health assessment survey found 64% patient participation rate of all eligible visits, representing 38% of all clinic visits. Reasons for the high variability of daily patient approach by front office personnel included large daily patient volumes, staff absences, competing duties, and forgetting about the survey (Rothemich, Woolf, Johnson, & Marsland, 2000). In addition, investigators observed participation bias in that men and older patients were less likely to participate.

To address the issues listed above, several studies have evaluated computer technologies to obtain health status information from patients with the intent of easing the burden of HRA administration. One study found that the placement of HealthTouch, a touch screen computer technology interface with 20-25 questions on personal and family history and lifestyle, in the waiting area yielded different results than when placed in the clinical area (Williams, Boles, & Johnson, 1995). Though placement of HealthTouch in the waiting areas targeted a larger segment of the patients, only 33% of these patients reported that their physicians discussed their personalized HealthTouch reports with them whereas 50% of patients who used HealthTouch in

the clinical area reported discussing their HealthTouch reports with their physicians. HealthTouch users were also younger than the overall patient population. These challenges persist even in more recent studies. A relatively recent study reported poor feasibility of a patient self-administered computer tailored health communication program within 10 primary care offices (Sciamanna et al., 2004). Only one of ten offices was able to successfully incorporate the computer program into their workflow and delivery of routine care. Barriers to incorporation included inconsistency with workflow, technical problems, time burden, lack of staff encouragement, lack of patient acceptance of the computer program, and the number and complexity of questions. Finally, though not a formal HRA, one study addressed the effectiveness of a web site to encourage patients to pursue healthy behaviors (Woolf et al., 2006). The web site focused on four unhealthy behaviors, poor diet, physical inactivity, tobacco use, and problem drinking; it featured an intake assessment that collected behavioral history and provided tailored health advice, similar to many HRA instruments. Given an estimated 25,488 unique adults within the six primary care practices over the course of nine months, the study resulted in 126 patients enrolled in the study. The study needed 1,300 patients (900 intervention and 400 control) for statistical power.

Furthermore, as noted by the experiences of the PBRNs, integrating health behavior counseling, including technical innovations for screening or assessment, requires substantive practice redesign (Cifuentes, et al., 2005). Also, adapting tools and techniques that were not specifically developed for practice settings required additional time and technical expertise, in which time and effort had been “seriously underestimated” (Cohen, et al., 2005). Experience in

the administration of electronic HRA tools through the EHR, personal digital assistant, or Web, was varied and ranged from successful to difficult (Cohen et al., 2011; Etz et al., 2008).

One framework that has been proposed to manage the lack of time for risk behavior assessment and counseling in primary care settings is the 5A Framework. The 5A Framework for behavior change counseling was developed by the United States Public Health Service originally for smoking cessation and is the counseling approach recommended by the United States Prevention Services Task Force (USPSTF). It is composed of five sequential steps: assess, advise, agree, assist, and arrange. A description of each of the elements is provided below.

- Assess – current behavior, importance of changing it, self efficacy, stage of readiness, social support
- Advise – clear, specific, and personalized behavior change, including information about personal health harms/benefits.
- Agree – collaboratively on the behavior to target (may be several), next steps based on stage of readiness
- Assist – self-help and/or counseling including goal setting and action planning to develop skills, confidence, support to achieve goals
- Arrange – follow-up (in person or by telephone) to discuss progress, barriers, adjusting plan

The 5A Framework has also been adapted for self-management support for use with the Chronic Care Model (Improving Chronic Illness Care). This Framework has been suggested as the foundation for incorporating various interactive behavior change technologies (IBCT) to support patient behavioral change as well (Glasgow, Bull, Piette, & Steiner, 2004). Some IBCT examples that can be employed in primary care practices to support the 5A Framework for behavior change include a clinic website, an in office CD-ROM for HRA administration, or interactive voice response telephone calls.

Summary and the Challenge Ahead

As previously established, health risk behaviors pose a tremendous challenge to patients and primary care providers in the development and exacerbation of multiple chronic conditions. The advent and expanded use of EHRs may serve the healthcare needs of patients with multiple chronic conditions and their providers. However, the application of this technology to this challenge has been mixed. Despite this, the Society supports inclusion of a core set of risk behavior measures into the EHR and affirm their commitment to this recommendation (Glasgow, Kaplan, Ockene, Fisher, & Emmons, 2012). However, there is an acknowledgement that collection of a broad set of behavioral risk measures into the EHR requires some harmonization of efforts so that the burden of collecting such data does not overwhelm an already under-resourced primary care system (Estabrooks et al., 2012). Therefore, obtaining the primary care providers' perspective on how this recommendation may affect their practices is important.

The purpose of this study was to examine primary care providers' attitudes towards the Society's recent recommendation of including risk behaviors into the EHR. Specifically, we sought to understand whether primary care providers see this recommendation as useful and if

there are any perceived barriers to implementation as well as challenges to implementation. Furthermore, we learned how information about these risk behaviors within an EHR might effectively be utilized within a primary care setting. Finally, based on these two questions, we provide recommendations for the efficient inclusion of risk behavior assessments into EHR systems.

Chapter 3: Methods

A qualitative research study design using semi-structured interviews was conducted to elucidate primary care providers' perspective, beliefs, and attitudes toward the inclusion of the Society's core behavioral risk factors into the EHR. Individual face to face interviews were carried out because they allow for more in-depth exploration of each provider's feelings, beliefs, and thoughts. Thematic content analysis of transcribed audiotapes was done using the conventional approach as described by Hsieh & Shannon (2005).

Participants

Purposive sampling was done through the King County Academy of Family Physicians (KCAFP) and the ARNPs United of Washington State. The KCAFP is a professional medical society that is active within King County that "advocates for King County family physicians and their patients." The American Academy of Family Physicians is:

"one of the largest national medical organizations, representing more than 94,000 family physicians, family medicine residents, and medical students nationwide. The King County Academy of Family Physicians has a membership of 700 family physicians. Its mission is to preserve and promote the science and art of family medicine and to ensure high-quality, cost-effective health care for patients of all ages." (King County American Academy of Family Physicians, 2013)

The ARNPs United of Washington State is a "non-profit organization dedicated to promoting ARNP practice by coordinating legislative, educational, and networking activities of Nurse Practitioners throughout Washington." Outreach was made to the President of the KCAFP and the Executive Director of ARNPs United. Each was informed of the purpose and nature of the

study and both provided recommendations on the best method to approach their respective members.

Outreach to primary care physicians was initially made to the President of the KCAFP in August, 2012. With the President's approval, a presentation was made to the KCAFP board members at their September, 2012, board meeting. Individual KCAFP board members informed their respective organizations and contacts about the study, and the majority of physicians who agreed to participate in the study were made through various KCAFP contacts. Additional physician recruitment occurred through a staff interest group within Group Health Cooperative known as the Health Equity and Access Team, a group that is interested in serving the medically underserved.

Recruitment of nurse practitioners was made through the ARNPS United contacts database, and affiliated organizations listed on their website such as the Puget Sound Nurse Practitioner Association. Also upon suggestion of the ARNPS United Executive Director, recruitment was done during the Pacific NW 36th Annual National Conference on Advanced Practice in Primary and Acute Care.

Recruitment was limited to practitioners with three or more years of practice. We did not exclude practitioners on the basis of whether they currently use an EHR. Interviews were meant to be 30 minutes though the length was up to the interviewees resulting in some interviews lasting approximately 45 minutes. Interviews occurred at the convenience of the interviewee; the optimal location for each interview was also determined by the interviewee. Audio recordings of the interviews were collected to ensure the integrity and accuracy of each interviewee's perspectives and attitudes. No personal identifiers were collected and interviewees were known

only by the interviewer and a combination of alphanumeric sequence numbers generated by the interviewer.

Because the aim of this research is to illuminate the provider's perspective, interviews concluded once thematic saturation was achieved. Thematic saturation is the point at which "no additional data are being found whereby the (researcher) can develop properties of the category" (Glaser & Strauss, 1967). Smaller sample sizes can provide sufficient saturation where the research has fairly narrow objectives and participants are relatively homogenous (Guest, Bunce, & Johnson, 2006; Sandelowski, 1995). Since minimum estimates of thematic saturation range, depending upon the research (Kerr, Nixon, & Wild, 2010; McTigue et al., 2011; Zickmund, 2009; Zickmund et al., 2008), from five to 20 participants with minimum interrater reliability of Cronbach's alpha ≥ 0.70 , a minimum sample size of 15 participants was determined necessary to achieve thematic saturation for this study. Interviews were conducted from September, 2012, through November, 2012.

Questions

To gain an understanding of the providers' perspective on incorporating the 17 behavioral and psychosocial questions into an EHR, open ended questions were asked regarding the provider's beliefs and feelings about the collection of all 17 questions. For the purpose of this study, each question within the nine domains was specified as an independent measure in order to understand how providers might prioritize each risk behavior item. The list of study questions are below:

1. The Society of Behavioral Medicine recently issued a policy statement supporting inclusion of a "core set of behavioral and psychosocial measures in EHRs." Looking at

this list of 17 measures suggested by the Society, what is your opinion and perspective about including these measures in the electronic health record?

2. Do you currently collect all of this information through some sort of health risk assessment tool in your practice? If so, could you describe the process?
3. Given your current practice, how do you see the collection of these 17 measures into an EHR for all patients over the age of 13 occurring in your current workflow?
4. How could these 17 measures inform the decision making of you or your staff? Which staff members?
5. Would you be interested in downloading responses to these questions from an external source, such as health information exchange, health benefit exchange, or a patient's own personal health record?
6. Given the 5A Framework for behavior change (assess, advise, agree, assist, arrange follow-up), are there certain technologies currently available that you believe could be employed to support the application of this behavior change Framework?
7. From the list of 17 measures, which are the top five measures do you see as most important in addressing your patient's healthcare needs?
8. Looking at your top five behavioral and psychosocial measures, how do you see this information align with alerts and/or reminders within an EHR? What triggers could they be linked to in order to inform your clinical decision making?
9. What are your thoughts about this policy recommendation becoming a regulatory mandate such as through future Meaningful Use requirements?
10. Do the inclusions of these measures align with your view of patient centered care?

Risks

Risks to the interviewees were minimal, and included inadvertent public disclosure of their personal and confidential thoughts regarding risk behaviors, EHRs and their patients' conditions. This risk poses additional risk to the validity of data collection. In order to minimize risk to data validity, several precautions were made, which are listed below:

1. Interviewees were asked to suggest an appropriately private setting for the interview. If none came to mind, the researcher suggested several private meeting rooms in surrounding libraries and offered them up for scheduling.
2. Audio recordings were stored in pass code protected media in which the pass code is known only to the researcher. Also, interviewees were only referred to by their alphanumeric code in audio recordings. Mappings between the interviewee's abbreviated names and alphanumeric code were stored in a separate computer that is also password protected.
3. Transcription of all audio recordings only used the interviewee's alphanumeric code to identify interviewees.

Finally, the University of Washington Institutional Review Board required, and received assurance that no patient specific risk behavior information would be asked of providers.

Analytic Process

As each interview was completed, an electronic version of the transcripts using Microsoft Word was made of the audio files. Interviewees were referred to by their alphanumeric identifier on the electronic copy of the transcripts; the alphanumeric identifier served as a primary key for

database analysis. Each transcript was read independently and an initial list of codes generated. The “constant comparison” method was used to develop or appropriately assign codes as more transcripts were reviewed in order to refine dimensions of existing codes and identify new ones (Glaser & Strauss, 1967). Microsoft’s Office Suite, specifically Word, and Excel, was used to identify and sort relevant text across the transcripts for each code. At least two researchers performed this analysis for each transcript independently while iteratively developing the codebook. Discrepancies between codes were discussed and adjudicated between the researchers. This study was approved by the Human Subjects Division of the University of Washington.

Chapter 4: Results

As previously described, interviews were conducted between September, 2012 through November, 2012. Fifteen providers participated, comprised of seven physicians and eight nurse practitioners. Practice types ranged from solo practitioners and independent group practices, to integrated delivery environments and community health centers. The vast majority of providers currently use an EHR. Though one practice did not have an EHR, they do interface with lab and billing systems in their environment; and though they serve as a safety net provider for their community, they are ineligible for current EHR incentive payments. Basic characteristics of the study participants are listed in Table 3.

Table 3. Provider Characteristics

	N
All Providers	15
Gender	
Male	5
Female	10
Practice Type	
Group Practice	13
Solo Practice	2
Provider Type	
Nurse Practitioner	8
Physician	7

Themes

Five themes were identified from all interviews. They were constriction of primary care providers' time, importance of collecting risk behavior information, need to balance disease management with the patient's illness narrative, technology's contribution, and regulatory perspective.

Of all themes, constrictions on primary care providers' time could not be stressed enough. Given their time constraints, one provider asked, "my question as a provider is, just who is going to take the time to administer or to both input this...data into the EHR and then how do we fit that into the visit?" These questions are also complicated by the fact that "when I ask a patient a question, it's not a short answer even though I'm asking a yes or no question."

Another theme which emerged from the interviews is the importance of collecting risk behavior information from patients. Primary care providers recognize the importance of risk behaviors in their patients' lives and generally support the inclusion of risk behavior information into the EHR. As one provider stated, "I think it's great to include...these measures in the electronic health record," while another provider said "I think ideally it would be great if we could include these measures in the electronic health record."

Many providers ask variants of these measures though not to the level of detail and specificity as recommended by the SBM. Similar questions are asked around the time of an annual or new patient visit, and as one provider put it, "some of this stuff we actually do automatically...it is not these particular 17," while another mentioned that "I don't know that I get the level of detail on some of these." According to another provider, "I think that many of

these items are oftentimes captured in the health record...but we probably don't ask them in a systematic way, or in a way that makes for easy data collection."

The need to balance their clinical disease management responsibility with their patients' illness narrative was another theme in all interviews. Concerns over balancing these priorities led providers to question the evidence for these measures given their current workflow and that they already ask similar questions. As one provider in an independent group practice expressed, "in terms of inclusion not adverse to any of them, it's just a question of how's the data going to get collected;" another provider in a community health center asked, "how is that information going to get into the record and the other is how is it going to be accessed?"

In addition to a sense of unease over the collection of these measures, a large majority of providers raised the issue of having available resources to address these measures within their practice:

I think that this is good information to have in the electronic medical record if a clinic has a system for addressing what the information they collect is...but if they're collected without any kind of action plan, then it doesn't make sense to me to include them in the electronic medical record

For one provider, questions about having available resources to address many of the measures led to questions about the evidence base for asking some these questions, "there's not actually a lot of evidence that I'm aware of that screening for drug use yields a whole bunch, I'd be interested in learning more about why they decided to recommend that on such a global scale." This same sentiment was voiced by the majority of providers in the course of all interviews.

Within their views about technology's contribution, the fourth theme, three sub-themes emerged: technology as a barrier, as a facilitator, and as a potential partner. Some providers noted some of the ways in which currently employed technology is a barrier to patient care while others expressed satisfaction and appreciation for certain technologies that they are currently using such as an online HRA tool. Many providers suggested ways in which technology could be a potential partner in helping them improve patient care such as an automated system that could gather this information without requiring additional staff time; "many of these things can be asked in an automated way that doesn't require my time and that's the only way I think they will ever be asked on a consistent basis that mattered for [the] general population."

Finally, regulatory perspective came up as a final theme in all interviews. A significant majority of providers agreed that inclusion of these recommended behavioral risks measures into the EHR posed considerable difficulties, regardless of their practice type. In the area of data collection, one provider brought up the difficulties in translating a conceptual idea onto a practical national scale:

When you take a concept and you implement it as a required element of everybody's care that sometimes you don't exactly get what you set out to get...that sometimes along the way, how it gets implemented and how it gets received, sometimes changes the way that you actually do [it] in clinical practice.

These preliminary thoughts and opinions surrounding these themes were expanded upon further in the course of the interviews and serve as the foundation for understanding the provider perspective.

Constriction of Primary Care Providers' Time

Primary care providers face tremendous time pressures. This theme was prominent in all provider responses. Though many of the pressures were due to the complexity of healthcare delivery, some were also due to regulatory pressures. Many providers stressed that their allotted time with patients is usually “15 minutes.” Several providers work very hard to stick to their schedule and expressed grief when their schedules put them “behind.” Providers feel a deep sense of responsibility to stay on schedule as evidenced by this provider’s comment, “I’m not great at managing my time but I’ll get there.” One provider mentioned that “all of our visits are 15 minutes, even for new patients, even for health maintenance visits.” Within these 15 minutes, providers are asked to attend to multiple items as is apparent by this provider’s comment, “patients [are] coming in with 10 problems and it’s none of these [risk behaviors].” Comments from two providers below highlight the major impact that is embedded in this theme:

I can't ask myself, is this of value. I have to ask myself, what should I not do that I'm already doing if I incorporate this and...this is the fundamental problem that occurs in the primary care world every day, is that there are lots and lots of things similar to this, I think, that are good to do, and if we did them all, we would...take an hour for every patient and we have 15 minutes.

What makes these measures any more important than any of the 120 other things that we need to gather, and that's...where we struggle; unfortunately, what sort of wins is what's already built into the workflow. So what we're most likely to do is the stuff that we already do and so what you'd really like to do is to say that if we're going to add

something on, we need to kick something else out, right? If we're not going to make our visits longer, or if [they're] not gonna give us more time to think about what to do with this information, then we shouldn't just keep saying, oh, by the way, could you gather another 17 things?

Concerns over data collection frequency also came up as a result of providers' time constraints. Several providers were unclear about the recommended frequency and opposed the idea of administering these questions at each visit. One provider said, "if inclusion in the EMR means asking each of these questions at each visit, I don't think it's a practical measure." Another provider asked, "do I really need to get all of those 17 things each time they come in or does it make sense to just do some of them?"

Many providers, regardless of the type of organization, challenged the feasibility of giving the provider direct responsibility for collecting answers to these measures. A provider in an integrated delivery network stated, "if I have to ask these questions, there's not a chance I could do this." Several providers commented on the appropriate application of staff resources, "I don't think it's very cost effective to have me ask these questions." One nurse practitioner said, "I don't think that the provider should be the one that's collecting this information. I think that [in] looking at a model where everyone works to their highest skill level, then a lot of this [information], and to some degree, even intervening in some of this can be done by members of the staff like an RN care manager." Concerns about burnout was also raised by one provider, "we already feel that we are doing too much and every time we're asked to do one more thing, one more thing, one more thing, I think it really contributes to provider burnout." Another provider summed up his initial review in this way, "my opinion from reading over these is that

these would all clearly be good to include, the question of course is not whether something like this is beneficial, the question is whether it's more beneficial than something I'm already doing because my time is not infinite and elastic, and I already don't have enough time.”

It is clear that provider time isn't being restricted as much as it is constricted by additional task, responsibilities, and requirements,

I think part of the reason we've gotten to the trouble that we've gotten to with healthcare is because we've pretended like time and money were infinite and they're not and we've done that on the back of clinicians and clinical staff who are supposed to magically do more and more in the same finite space and the same finite resources and that's not working.

Importance of Collecting Risk Behavior Information

Providers in this study affirm the importance of gathering risk behavior information from their patients such that they currently collect and store some behavioral risk measures through a range of methods. As one provider stated, collecting risk behavior information “is a tantamount of primary care work.” Another provider said, “I think the inclusion of behavioral measures is a plus, I think it needs to be done and I think we need to get a higher level of awareness in the healthcare community in general;” in a similar vein, another provider stated that “for this to become part of the standard use in places that don't typically have something similar, then it would makes sense to do so.” Three providers within an integrated delivery network attempt to collect almost all of the recommended risk measures through a HRA tool; the remainder uses a variety of methods and tools for measures collection, from delegated staff inquiry such as

through a licensed practical nurse during the work-up, to direct provider inquiry. The data are stored in various locations in the EHR: social history, activities of daily living, clinical reminders or progress note sections of the EHR, depending upon the measure and on who is collecting the data. A list of provider general responses is below.

- I don't collect all of this same information; I tend to make it sort of a patient specific.
- Tobacco's in my EHR, that's a question in there, the rest of them we just ask.
- It doesn't ask about snoring, we rely on people to tell us that.
- There's no health risk assessment tool, it's incumbent upon each provider and they try to encourage people to do it by having little push buttons where you can open up boxes where it has further detailed questions; but do I currently collect all of it, eventually yes, at each visit no, other than smoking I always ask about smoking. All of these are things that are in my notes overtime.
- It actually gets pretty granular about whether the person is a current smoker or never smoker, a previous smoker, a sometimes smoker, what it was that they were smoking, when they quit.
- I actually do try to ask all of those questions and I usually ask them in a very general way and not quite as detailed as this but I say things like do you have concerns about your sleep, do you have any concerns about your level of stress.
- For the depression and tobacco it [is] quite well codified in my organization and into our records...and the rest of it is a little more mushy.

- I use How's Your Health and Instant Medical History depending upon the patient but I also ask these questions as part of the exam...during the yearly physical all of these questions are addressed in one form or another with minor differences.

Within the majority of integrated practices, the process generally follows the description provided below:

In our clinic, there's the LPN that checks the patient in, brings them into the room, opens their electronic medical record, clicks on that reminders button and has a list of quality measures that need to be done, they open each one and go through them, sometimes if they're taking the patient's blood pressure they might actually start asking questions as they're setting up the blood pressure cuff.

An HRA tool used by three providers within the integrated delivery environment is well regarded within their respective practices.

Yeah, so we have something called the health profile which is an online tool that we created that...patients can fill out that asks every one of these things...well, let's see as far as eating, it asks all of those specific questions and more, certainly for physical activity it's even more in depth and it has branching logic so it's quite advanced, for the risky drinking it asks more in depth [questions] because it has the audit form built into it, [it] asks more questions about smoking, like it covers whether you've smoked more than 100 cigarettes in your life which is a threshold point for when you do the aneurysm screening, lots of questions about substance abuse; I think it goes further in depth from all these things.

As one provider relayed, “So when a person signs up for their...online [access], they have the option to fill out this health profile which then gets forwarded to their primary care provider, there is also some promotions for them to do that.” As an example, patients who complete their health profile are given annual discounts on their healthcare costs. The time commitment to complete the HRA tool is approximately “45 minutes.” For patients who do not complete the online HRA, an abbreviated form is given to patients which addresses similar items,

we have an abbreviated version of the form that we often times give people when they haven't filled out the health profile, that's before a preventative exam visit; they get a two or three page sheet depending upon their age where they answer some of these questions.

Another provider described the process in this way,

if they haven't filled out their online health profile, then they hand them the...paper version and while they're waiting to be seen...they check [their answers] with paper and pencil; and then the nurse who checks them in, while she's doing their vital signs and writing their chief complaint and all, she takes what's on paper and enters it electronically into the medical record.

Most provider practices ask about physical activity, substance use, alcohol use, and anxiety and depression, though usually only when clinically relevant to the encounter. Stress and snoring were rarely asked on a consistent basis. Many providers asked about smoking status at every encounter though one provider acknowledges that it doesn't always happen, “I do talk to patients about tobacco cessation, whether they're smoking or not; I find that while technically

I'm supposed to be asking all patients, I'm really not." In comparing the recommended smoking measure, several providers noted that their smoking measure was more "granular." Providers expressed a mix of opinions over which questions they saw as important. Decisions to prioritize the list of 17 measures were based on the prevalence of the risk behavior in their panel population and the relevance of the question to an appropriate level of available intervention.

Smoking is asked by the vast majority of providers, specifically cigarettes, as a domain with primary significance in their practice. Because smoking remains a current concern, medical assistants and nurses are included in the assessment and intervention of the patient's smoking status in many of the practices, "[w]e all talk about tobacco. I mean our nurses are empowered to talk to our patients about smoking cessation when they get the positive answer." Within this domain, whether someone has smoked cigarettes was a top five item from the list of 17 questions for 13 of 15 participants.

Risky drinking was included in the list of top five measures for less than half of providers interviewed. One provider, who listed this measure as a top five measure, mentioned that over 50% of his patient population is comprised of mental health patients such that risky drinking is very important to him in addressing his patient's care. Another provider based his decision to include this measure as one of his top five because, "alcohol is a huge problem, and because we can actually do something about it, get people into treatment, get them to counseling, and let them know what a healthy limit is." Another provider mentioned that the risky drinking measure would be informative and that she would want that information assembled with the patient's

blood pressure, their CBCs, their LFTs, their history of Hepatitis C, anything so that a sort of a smart system can say okay these are all the codes or computable data that I have for alcohol this patient [which] scored positive; and it brings it together for me so that when I pull up my part I'm not only seeing the positive screen but I'm seeing the patient's medical record through the lens of somebody who's drinking too much; and so then I can use that to...print that out and give it to them and say here's all the way[s] that alcohol's affecting your body.

A couple of providers thought that the measure threshold of five drinks for men and four drinks for women a day were too high. “We’re eliminating five or more drinks a day as risky drinking or four for women, that’s setting the bar so high that it probably wouldn’t be helpful to me,” said one provider. Another provider expressed her concern about the threshold in this way:

the risky drinking one...this is basically screening for people who are getting intoxicated but I think that the majority of people who come to me with drinking problems often have two or three every single day, so that kind of dependence, particularly for people who have anxiety, I think would be missed.

Substance use, though important to know about, did not come up as a priority for the majority of providers in this study. It was ranked within the top five most important measures for four providers. Treatment effects were important for several providers with regards to substance use, as well as alcohol. A community healthcare provider mentioned that “substance use, especially in our population, there’s a huge prevalence of cocaine abuse and it really confounds especially hypertension treatment;” and another provider said, “well prescribing drugs

for sure; so if someone's a substance user or risky drinker, then certainly there are drugs I wouldn't want to prescribe" when discussing potential alerts or reminders that could be linked to the risk behavior. However, for several providers, substance use is not highly represented in their patient population, "substance abuse is obviously very important but I would rate it a little less important 'cause most people aren't doing drugs; it's a minority, not as big as smoking and drinking, anxiety and depression."

Depression was ranked within the top five for four providers. One provider chose two of the four measures within this domain that made up the PHQ2 tool while another found it difficult to separate out the two questions, however, when pressed she chose the question which asked about feeling down, depressed, or hopeless. Of the four questions in this domain, the question asking patients to rate the degree to which they've been feeling down, depressed, or hopeless in the last two weeks was selected by all four providers. One provider commented that the USPSTF "says screening for depression, if you don't have a system in place to manage depression, is that necessarily the right thing to do."

Measures in the stress domain ranked in the top five measures for four providers. The quality of life measure was included in the top five for two providers while no one included either of the questions in the sleep domain. However, several providers mentioned that patient responses to questions about a patient's daytime sleepiness in the last seven days would prompt a sleep apnea study while it would trigger an Epworth Sleepiness Scale test for another provider.

Questions within the eating patterns and physical activity domains appealed to a wide majority of providers. Over half of the providers included the question about days of moderate

to strenuous exercise in their top five measures, which they saw as most important in impacting their patient's healthcare needs. Half of the providers selected the question on eating fruits and vegetables in their top five measures in the eating patterns domain while a third chose the question on soda and sugared sweetened drinks in their top five measures. There is a clear recognition by all providers that diet and level of physical activity are important to their patients' health. However, it is unclear how providers can incorporate this information into their decision making when most patient appointments are of limited duration and based on medical necessity. As one provider explained,

there are some domains that I think, at least I as a provider, have a sense of what I'm supposed to do, then there are other domains such as eating patterns and physical activity that just feels less valuable to spend my time in those areas a) because I think somebody else could do it and b) because I don't think that it's the lack of information that keeps people from changing. I think there's a whole bunch of complex psychological and lifestyle and financial and time and over work and all that stuff that contributes to [it and] that it's going to be difficult for me as a provider to address in a primary care session.

Limitations of current data collection process. Regardless of the data collection process, many providers expressed limitations in their current method. Lack of standardization between providers in a multi practitioner structure posed challenges to data retrieval and information review. Attempts to find information entered previously by another provider during a patient visit can result in frustration. A provider stated her annoyance in this way, “when you open up a

chart that is somebody else's patient, everybody...has a different way of doing it which is mildly irritating [so] people don't necessarily know [where] to look, where people are charting it."

Another provider admitted that,

some of these are questions we ask but we probably don't ask them in a systematic way or in a way that makes for easy data collection and what we've found as we've transitioned to meaningful use [is] that I ask about eating patterns but I free text it into my progress notes so nobody else can find it in a way that's meaningful to prove that we've be gathering it or what we're learning from it in a systematic way.

Another provider stated that entry into the progress notes "makes it really hard to find. As a person who is doing QA to see if this is really done it would be really tough."

For providers whose practice administers an HRA, a limitation is that response rates for HRA completion is fairly low, even with the financial incentive. As one provider mentioned,

So the problem is that most people don't take the time to do it. We have a huge percentage of people that [are] technically able to do so 'cause they're signed up for [their] online access so they could do it but they don't, something like 75% of our patients are signed up for [online access] but only a tiny percentage actually regularly take the time to do something like this once a year like it's recommended.

In addition to the challenge of collecting this information electronically, there are also additional challenges to encouraging providers to glance at the HRA responses in the EHR. As one provider noted, "the challenge is even if they fill it out, even taking the time to recognize that they filled it out and glancing over it, even that is a hard sell 'cause...we're so busy [with]

patients coming in with 10 problems and it's none of these things." Interestingly, providers mentioned that it is actually easier to review the abbreviated paper form.

In the form, ...the answers that we like are in narrower boxes or boxes that aren't as bolded as answers we don't like, so it's pretty easy to skim down it and just look for check marks that are in darker boxes and that's how I happen to do it. Other people would maybe look at what the nurse wrote down in the electronic version, but I do find it quicker to use the paper and pencil version.

Ideally the docs are looking at either of those forms and scanning down the form or the online version and looking [for] answers that are of concern; if someone's filled it out on paper, we have it set up so that the potentially concerning items are bolded so you could just visually glance to see if they've checked anything that's bold, on the health profile ironically it's not quite that easy because it hasn't necessarily drawn as obvious attention to it...it doesn't just sort of pop up and hit you in the face like it does when you have a piece of paper in your hand.

To summarize, providers affirm the importance of collecting risk behavior information from their patients, though the decision of which risk behavior to collect and which measure to employ depends upon their patient and availability of appropriate intervention. Providers also expressed several limitations in their collection efforts.

Balancing Disease Management with Illness Narrative

Providers in this study expressed a strong need to balance the clinical management of disease with their patients' illness narratives. Many times, it is medically necessity, as opposed to addressing risk behaviors, that is a driver within primary care appointments, regardless of the practice types. As one provider in an integrated delivery environment stated, "if I was seeing a patient and they said they drank a lot of soda and they weren't overweight, they weren't having any health conditions that were related to it, I may not ever bring it up; it depends upon what other priorities there were that day." Another provider said, "these aren't often the things that patients come to us concerned about; this is not what the patient's medical mind is centered around." Other providers voiced similar sentiments:

I think patient centered care is...a much broader term where you're interacting with the patient in the way they want to interact; whether phone or email or in person, and in any given visit, honestly most people don't want to discuss these things so one definition of patient centered care can be that you're addressing the things that matter to them. And it's sad, but people never come in and say I want to talk about my weight, they come in for the viral URI that you can't do anything about that's going to go away on its own anyway; so sometimes you have to do what's best for people even when they don't realize that's the best thing, and I don't want to deal with it but it is patient centered care in the things that matter.

this doesn't tell us how important these things are to the patient, this tells things that we know are important to people on a population level and so what's additionally patient

centered is to take this information and then to use it in a way that allows the individual to determine what they want to do; it's not uncommon for somebody to be a smoker or a drinker and for them to say I have no interest in talking about this now or ever and it would be most patient centered for me to respect that and so it's patient centered in that it helps me know information but it's not the end of it in terms of what you have to do to create an environment [of patient centeredness].

I think that these are questions about patients that are good and that I think relate to being very important to ask them, to know, but I think for the most part it's having the conversation with the patient which will get the information that's important.

I mean it is certainly part of patient centered care [but] it depends upon how you use the answers whether it's a patient centered response or not that you use, but it's part of patient centered care to solicit the patient's view of what's going on so it is part of it.

As illustrated by these comments, primary care providers understand that patients face their own set of challenges in addressing their risk behaviors, especially once they have developed a chronic condition which requires its own medical self-management. As one provider stated, “these are good general health behavior measures...but there's probably 17 additional health behaviors that once you've been diagnosed with a chronic disease that are important to learn to adopt.” She continued by saying that:

it takes a lot of time for a patient to self-manage their disease in terms of medication self administration, going to the doctor, monitoring their peak flow...whatever else that

would take up a significant chunk of [their] day; and that as providers, adhering to the recommendations for...either assessing these health behaviors or assessing chronic disease needs, takes up a lot of time and isn't always what's on the agenda for the day.

Overall providers tended to describe their practice as “reactive.” One provider said,

we try to treat what has already been done; so the person has already gained a hundred pounds and now they have diabetes and so we focus on the diabetes...so I think as providers we kind of get side tracked because...it sometimes [is] kind of easier to treat the diabetes because we think we can sort of get there, we're going to get those blood sugars lower with this kind of medication...I know for my patients...I don't see very many people losing weight; and these sort of evidence based approaches...for behavior change like motivational interviewing and all of those wonderful things are very hard to do in a primary care appointment.

Another provider described the tension in this way,

part of the reason, I think, that allopathic physicians don't like to talk about risk behaviors is that we can't fix them. I mean, we spend a lot of time going to school to learn how to prescribe people medicines and that's the vast majority of the work that we do, and so counseling people about behavior change and offering them support for behavior change and functioning in a system that doesn't [support that].

Many of the providers within an integrated group practice balanced the tension between clinical management of disease and their patient's illness narrative with help from support staff

and ancillary services. A couple of community health centers have a range of staff that access and utilize risk behavior information:

As a community health center we have kind of ample staff that accesses this, so we have behavioral health staff onsite and so I can see the anxiety and depression, also physical activity, all of those things helping the behavioral health staff.

One community health clinic nurse practitioner detailed the decision making in her practice as such:

Well our medical assistants would be the ones that set up the system by which the patient would answer those questions. But they don't respond to the results of that. We would have...three categories of staff that would deal with it; well, maybe four...we have nursing staff that works with chronic disease management, we have the providers who make recommendations, and we have social service support and that includes behavioral health counselors as well as mental health and social service providers who can touch on what resources might be available to address any problems that are identified here.

In fact, many providers' hesitation about the Society's recommendation stems from the USPSTF's recommendation that it is not necessarily the right thing to screen for depression unless one has a system in place to manage it, as previously mentioned. One provider summed it up in this way:

You would want your clinic to have resources to address the information that you've collected...I think when you translate them, from a provider perspective, you have to do it in the setting of your whole system, you can't just say well this is what's recommended

and so we're going to do it, you have to really look at the information and the outcomes that you want and then look at the resources of your clinic and how you're going to provide that; and if you can't provide that, then I really think that there's reason to pause before you start...down the line asking all these questions. We know that a lot of the recommended quality care measures...take some number of large hours, so we're adding that onto this, and that's not to say that these aren't important; because they're more proactive, [and] we're sort of reactive in medicine.

Also, as previously mentioned, several providers were skeptical of the evidence base that screening for a measure such as drug abuse has any effect on the outcome in the same way that risky drinking does. Overall, providers are committed to improving their patients' lives and express a strong desire for actionable data. As several providers articulated,

With these things, the only purpose in doing any of this stuff is if it gives us useful information in two regards, one in helping the individual patient and [two] if we're going to take moments of that 15 minutes that we are allowed with the patient, then [it's] got to be worth it to invest in that time.

I think that incorporating these again has to be done with outcomes in mind, and the outcomes are what need to be measured; so we collect some of it but the way that it's done depends on the facility.

I think that for successful implementation of these 17 things you would have to have it be a shared responsibility, not here's all the information that goes to the provider and then

you do everything that you're supposed to do; it would have to be a team approach and that clinic would have to have access to adjunct specialties to address what they found, and then I think it would have to have a readiness to change question in here because that helps me as a provider know where they are and adjust my approach to them based on where they are coming from. So I think the bottom line [is] it would be really tough.

The benefit of including stages of change or readiness to change questions in the EHR was mentioned by several providers; “and then the patient is actually encouraged through the process of filling out the health profile to consider their readiness to change.” In fact, one provider who did not have an HRA but who had used an EHR that had incorporated stages of change questions into their patient’s assessment spoke positively about the inclusion of this practice.

when I worked at [this organization] and there was a diabetes flowsheet that we were supposed to use and so every time you saw the patient you were...supposed to set up some sort of goal for them and...when you set up the goal, it automatically went into this stages of change thing where you had to talk with the patient and get a number like how important is this to you on a scale from 1 to 10; but that was something that I had to do with the patient although I think you could probably have the MA do it as well. And I think that...it worked. I think that it's one of those things where you kind of need to figure out a way to make it flow but I would be open to trying it. I mean we're throwing pills at people and...often that's not really the solution to the problem.

Additional comments on the benefits of readiness to change were important for a couple of other providers.

we could make an algorithm that said, if your patient has said that they have this behavior...we'll make sure that their portal include links to these things that would be, depending on where people are in their stages of change, right? For the pre-contemplative person to learn more about why we're concerned about that, which they can do at their leisure and when they're ready to hear that as opposed to me. When that's not what they came to talk about and that's really not what I really thought we were going to talk about [and] now trying to figure out a way to spend another three minutes talking, "wow, I'm really concerned about your alcohol use," it would be nice to use technology.

I think it would have to have a readiness to change question in here because that helps me as a provider know...where they are and adjust my approach to them based on where they are, where they're coming from.

Overall, out of 15 providers in the study, six mentioned stages of change or readiness to change as important pivot points for the patient and the providers. In addition, support for behavior change requires human intervention as one provider described in reply below:

the tricky thing here is that I can give someone the best advice in the world, in the best way possible, and they go home and do whatever they want; and it's critical for all of

these things that people are trying to change to have someone follow up with them and ...maybe someday there could be something automated that works well enough, but I think oftentimes you need some person to sort of follow up and say, hey, how are things going, with whatever; so some sort of health coach and it can't be me...I don't have the time to do that. I don't have the time to even think about reaching out to people like that so there really needs to be someone else involved.

It is clear providers appreciate their patients' need to balance their own disease management with their personal narrative as expressed by this provider:

what I find is that patients are often overwhelmed by thinking about behavior change; it's just not something they have learned how to do very well and so that assessing it and kind of nudging them, even that, is actually an additional source of stress; so I don't know in terms of patient centeredness. Again, I think having the resources to address it is what really makes patients feel more that you're in their court, so I don't think I can really give a yes or no [answer]. I think they are I think they're important determinants of health...but it's quite challenging even as educated and motivated and everything else that I am, and with all the support that I have, with all the financial and social...support that I have, I find it quite challenging, but it has helped when I have someone on my team to work alongside me and I feel like that's something that's still kind of being figured out within our current healthcare system.

Technology's Contributions

Overall, providers had a mixed perspective with regard to the contributions of technology in their practices. Within this theme, three sub-themes emerged from all interviews: technology as a barrier, as a facilitator, and as a potential partner.

Technology as a barrier. Though EHRs are generally viewed as a catalyst for efficiency, a couple of providers expressed a more complex relationship to their EHRs. One provider said, “since we’ve turned on our EMR here five years ago, I haven’t seen us taken anything out of the workflow, right? I mean all we’ve done is add to the workflow and that’s probably not a good long term model.” Another provider stated,

it’s a tricky thing to use the electronic medical record for these kinds of things because what I’ve seen is that the quality of the screening gets short cutted so...for example if you have a validated screen...how you ask that question is going to gauge your answer. [For example,] the PHQ2, it’s a validated screen and it has to be asked in a validated way, and what I hear from the people who are doing the screening is a lot of short cutting, instead of asking the PHQ2 questions, they say have you been depressed, [or] instead of asking the question of how many times in the past year that you’ve had x or more drinks in a day they’ll say do you drink alcohol, that’s a different screen, but they’ll click the box in the [EHR] that says the validated answer...they kind of shape whatever the patient says into that answer.

Time pressures on staff to accomplish all required elements in a work-up can lead to abbreviated multitasking such as when they are gathering blood pressure readings at the same time as administering quality screening measures:

Which is often when you'll get the, do you drink question, as they're trying to multitask; and in all fairness to them they have a lot to go through, there's a lot of required measures and so they're trying to get through that; that's the tension between getting good data...and getting that patient to the provider so they can take over.

In response to a question about alerts one provider stated,

the concern with pop ups in the current state of my records is that they are so rarely useful and the actual alerts are buried; so if someone's been suicidal I have to search for that information, that in and of itself does not come up and say this is a suicidal patient [and] if I am giving lithium to someone...it should automatically let me know if there's been a suicide attempt in the past but...that's not what happens currently.

As these comments show, the ease to which healthcare data can be stored doesn't translate into the ease to which they can be collected, or even retrieved.

Also, lack of standard collection for these data elements in current EHR systems is another barrier to implementing the Society's recommendation. In fact, because providers are already collecting variations of this information in multiple ways, a complete reorganization of the clinical workflow would need to be developed to satisfy a standardized process. For example, to accomplish the Meaningful Use Core Measure requirement to obtain smoking status in their EHR, several practices had to redesign not only their EHR system, but also revamp their workflow to integrate the collection and entry of that measure into their EHR. As detailed by one provider who was an EHR adopter prior to the HITECH Act,

most of us have had a lab value of smoking status, current, former, where they smoke, how much do they smoke...how many packs per day, what are they smoking, did they

quit...what was the quit date, the quantity, and how many years have they done it; so that's stuff that most doctors have saved over the years. Well so the new Meaningful Use criteria requires that we only have current smoking status...And we can't use the ways we've saved it to report it, we have to use whatever the EMR manufacturer puts in as the new data point that they count... [so] I've got 12 years much more rich data on smoking that I basically just about scrap to meet the Federal requirement to get less value [from] a piece of data.

Lastly, as one provider described, “we’ve had to train our medical assistants as part of Meaningful Use to really work on getting just smoking status put in.” Hence, modifications to both computer and clinical systems would need to occur.

Even with these modifications, several providers noted that non-English speakers and inexperienced computer users would still need staff intervention or adaptation:

I think for our population specifically we have a number of patients who don't speak English [and] we have a pretty significant geriatric population who does not feel particularly computer savvy. And so I worry that even if we put them in front of a computer, they wouldn't feel competent to do that but I can't imagine how we would. I mean, I can't imagine an MA or a nurse or a physician, even [with] the time that it takes to do the data transfer, if they fill this out on a piece of paper, still feels it's like 17 new things; you know we count by clicks, and that's a lot of clicks.

My patient population has a lot of non-English speakers and semi-literate people and so it would be more challenging and there would have to be some kind of adaptations made

to accommodate those; I mean we have a huge range of languages that people come in with and so I would like to not worry about gathering different sets of information, I want to make sure it's consistent for all of our patients.

Technology as a facilitator. As previously mentioned, when readiness to change assessment was incorporated into the EHR, it assisted providers in adjusting their approach to their patients in positive ways.

In addition, practices that administered an HRA tool mentioned the application of algorithms in their tool that included branching logic which provided personalized advice based on the patient's response:

You fill out this health profile and then immediately based on your answers there's logic built in that says, oh, so I see that you're above this ideal weight and you're not eating that well, here's things to help you; and it asks a bunch of detailed information on nutrition and you should cut out these sugary drinks cause it's adding empty calories.

There's a little bit of that in our health profile because when people fill that in at home which would be this first phase assess then it gives them some advice and then it links them to certain websites that they can look and read about and if they want to read more [or] you know we see that your diet doesn't look that good would you like to read more about it and a lot of people at that point say no and go on to the next question but if they say yes then it will talk to them about it and we do know that when they come in we're

told readiness to change is low or readiness to change is interested so I know that part is certainly very doable.

Providers suggested other opportunities for technology to facilitate the patient care process. These suggestions are detailed within the next sub-theme.

Technology as potential partner. Suggestions for future implementation in collecting the recommended measures were to consolidate these items into a template within the EHR.

- I would prefer that it was a questionnaire that they could somehow complete electronically that would be incorporated directly into the EHR.
- Well I probably wouldn't ask them all in one visit, but if it's in there, if it's in my new template in the EHR, then it's a reminder that I would on their primary care visit.
- I think this would be perfect if they have a template then, when the patient [is] waiting for their provider they can fill it out; that's save us a lot of time also.
- A lot of this could be done if our templates were a little bit more easily accessed, I mean the EHR could put this up as a template.

Several providers suggested that responses to these questions could be gathered through patient portals in their current EHRs as a way to support assessment; others offered that educational resources could be delivered through these portals via Internet links as well as having computerized health advice available in waiting rooms:

I know people are trying to figure out ways that we can push email or could we text with patients or how do...we send email reminders beforehand to say, hey, can you go to the

portal and fill out your questionnaire and so we can make sure we talk about these things.

Another provider suggested a potential functionality that could allow patients to securely answer these questions directly within the EHR while they are waiting for the provider in the exam room:

Oftentimes the patient is in the room and if there was a way that we could securely let them in to complete the questionnaire that could be appropriately imported into their chart without them having other access...we have a way to do that for other things when they enroll for our health portal, they can check it in the room and so we can actually set them up on a different screen so it secures the EHR so they can't get back into it, but they can do the work they need to do to build their username and password and...be on our computer doing patient based work.

When asked about downloading responses to these measures from a health information exchange, health benefit exchange, or a patient's personal health record, providers had mixed reactions to the idea. Many providers were initially unclear as to what these data streams represented. After some clarification, some providers approved of the idea; from "if it could be something that was worked into the workflow, I think it would be fine," to "I think it would be ideal...I think that when possible, self administration...takes out the whole judgment aspect of it so that they aren't hearing judgment in somebody's voice." One provider recommended that the values be downloaded as "computable data" as opposed to being "just straight text." Several providers opposed the idea based on the assumption that the information would come in as a scanned document. "No, our record is just way too busy to begin with, there's just way too much

stuff in there. I think these needs to be in there, this kind of stuff...but I'm not sure from an outside source." Another provider said, "at this point, I may not because I think we [have] information overload; I'd rather have generic template...I think if we have so many variation[s] of templates [that] it's harder for us to look for information when we really need it right away." Others continued to oppose the idea because they wanted to validate the responses; one provider said people change and she wanted to know when the questions were answered:

if it was something the patient filled out, I would want to confirm that indeed some of these are still current I'd like to know the date that they were filled out because if it was two or three years ago, people change; if they did it last week we'd say well it says here that you have never smoked is that correct; so I'd want to verify a few of them to get [a] sense for the validity because what we put on paper and what we say verbally sometimes is different.

Another provider felt that these measures do not lend themselves to being asked outside of the point of care:

I don't know because some of these are really point of care type questions, they are asking about over the past seven days, and in the last seven days, smoking in the last 30 days...I think it would have its most relevance in the time when you are actually obtaining it.

Interoperability was another concern surrounding suggestions for downloading these responses. Many were skeptical that this information could easily be downloaded without any issues since many providers already face numerous interoperability problems with their current systems. One provider suggested that the Child Profile system in Washington State could be a

useful model for EHR integration, since their system interfaces well with this external source. The Child Profile system is hosted by the Washington State Department of Health and is currently called the Washington State Immunization Information System, formerly the Child Profile Immunization Registry.

In general, the idea of alerts elicited a range of responses though mainly suggestions for limiting their use. Many providers opposed the idea of linking these responses to a system of alerts. One provider, in response to the idea of linking certain alerts to some of these risk behaviors mentioned, in passing,

could it be smart enough to link with specific diagnoses, so if I've listed my diagnoses as diabetes or hypertension or obesity, could it then find a way to alert me that somebody [has] terrible eating patterns...[or] if you were worried about prescribing opiates, you need to know about their daytime sleepiness and their snoring, or if you're getting ready to give them a benzo, did you know she has seven drinks a day...to capture those things that are going to put them at risk, kind of like a med interaction alert to say this behavior is particularly concerning in light of this diagnosis.

Instead of alerts, several providers suggested a dashboard or flowsheet display that “would passively appear” in which the undesirable threshold reached by the patient was highlighted.

In response to the application of any interactive behavior change technology (IBCT) within their practices, many providers were unaware of what IBCTs were available. Many had difficulty coming up with some possible IBCTs that could be employed. Providers' reply ranged from uncertainty to stating that behavior change was not a technological issue:

-I don't have any idea; I would hope so.

-Um boy I don't know of them.

-No I don't think it's a technological issue for behavior change; I don't think that's going to help.

-Well I mean it seems like you can imagine a situation, and I don't know, and I would guess this technology probably is available.

-Uh, I don't know, I'd have to say I don't know about that one. Um there's all kind[s] of, you know, everybody has smart phones, they have computers, so I suppose they could download an app to help assist with that, um you know, and then you could review it after.

One provider suggested that this may not be the best role for primary care providers:

I'm not entirely sure that the provider is the best person...I think when the patient comes in they want to see the person that's going to be making the decision with them and have a conversation and I think getting the support they need to make lifestyle changes or get information, lots of different people can be involved; and I can even see a technology consultant be the person that would link the patient through their plan to their provider, but I'm not sure that's the best use for providers themselves.

To summarize, though providers are receptive to electronic administration of some kind of abbreviated health risk assessment tool that patients can complete prior to a provider visit,

experience from providers who employ this method demonstrate that challenges persist for patients and providers. As one provider suggested, “I think it would be difficult for the patients too, that’s a lot of questions to ask them.” Also, as illustrated by efforts to obtain Meaningful Use incentives with the smoking status criterion, EHRs would need to be reengineered while workflows would require “significant” modifications and that staff would need to be trained on the administration of these validated measures.

Regulatory Perspective

Providers voiced dismay at the possibility of the Society’s recommendation becoming a mandate. A couple of providers expressed a sense of powerlessness to affect policy. One provider said “I feel like I’m just a bozo on this bus and other people will make those choices and we will be required to implement them and that’s just the way it’s going to be,” while another said “the mandate just comes down [and] the position is you just do this.” Another flatly said, “I think I’d be ready to quit.” A couple of providers expressed their distress in these ways:

Philosophically I’m fine with it, practically speaking it makes me mad...what do you want me to stop doing in exchange for another requirement; and if all you want is a boxed checked, that doesn’t have to be the provider that can be anybody but if you want action taken and meaningful use, that’s a provider issue. Unless you’re going to reimburse me or the institution for counseling sessions for maintenance issues which are poorly if not at all reimbursable, I’m not sure it’s going to happen; so how do we think change is ever going to be accomplished.

We already feel that we are doing too much and every time we're asked to do one more thing, one more thing, one more thing, I think it really contributes to provider burnout; obviously I think until we have a major paradigm shift in healthcare in this country we're just going to continue to find ways around meaningful use which means we click the number.

Reimbursement was an issue for another provider:

I wish that it would be linked with reimbursement for positive healthcare management rather than diagnosis and treatment. I think that our current medical model for healthcare is misguided and that if reimbursement were tied to more outcomes and how empowered a patient feels and how well they're able to take over responsibility for their care and that was what we got reimbursed for, then this would be more useful; so until this happens it will [be] burdensome to implement because we still see patients on 15 minute intervals and many of them are not English speaking and even explaining what these questions mean, and then getting the answer, and then trying to use that information will be onerous. So it's a great idea, but it's got to be tied to other fundamental, philosophical changes in how we define health services.

Also, though one provider expressed concern over this recommendation becoming an unfunded mandate, it is not only the lack of funds which pose the greatest challenge. As one provider stated:

I recognize that it is well intentioned...I worry that it is an unfunded mandate. It's asking us to do something that [there] is simply isn't time to do. I would love to be able to do all

these things but it has to be a coordinated system done well, primarily [with] someone else doing much of the counseling, and the way these things tend to work is that that's not the way it's set up because many people don't have those systems and the mandate just comes down [and] the position is you just do this. We have a lot of those things in [the] 65+ Medicare visits and it is, to some degree, it's good cause it does forces us to address those things, but it's just very easy to end up with more stuff to do than you can possibly get to, so I'm torn. I am ambivalent about the suggestion; I totally see it [happening], I wish we had more time to do it right.

On the other hand, penalizing providers may lead to unintended consequences as one provider explained with regards to current Meaningful Use Stage 2 requirements wherein financial penalties for not complying in the future would lead to shifting that cost onto the patient. Other providers cautioned against mandating such recommendations citing other unintended consequences based on a different scenario:

let's mandate that we look at pain as the fifth vital sign; okay so we started prescribing more pain medications, now let's mandate that people not be getting too much pain medications.

One provider gave a description in which a requirement is fulfilled but not in a meaningful way, “but what ends up happening is that you can't close your chart until you pushed the button that said you reviewed it,” and so the button is pressed but the data element isn't always reviewed as prescribed by the intended process. As another provider detailed:

I think it's a bad idea for the reasons I stated before, when you take quality measures that are good...on an individual level, but [when] you mandate across the clinic, it morphs

into something completely different. And if you don't have outcome measures besides documentation then you're not measuring anything because all of us know that sometimes what gets documented is not what happens and so an electronic medical record is very good at dumping in text to a progress note and it can dump in the exact right text but it doesn't mean that the patient heard all of that text or got the benefit of all that text for many reasons that have nothing to do with providers being good providers or wanting to do the right thing.

Several providers expressed concern that complying with another regulatory mandate can result in omitting the patient's needs; as one provider described below:

I'd be against that, I think it would force us to take this at the expense of other things that maybe, on any given visit, may be more important so the more we do mandates, the more that we say every visit has to comprise what this school of thought thinks is really important, or what these guys think are really important, or what these guys think are really important. There are so many hoops that we jump through that it's easy to lose sight of what [the patient is] there about and what's the most important thing to do for a given day. So I wouldn't want it mandated.

Another provider voiced concern about the link between the measures and the expected outcomes from these measures:

I like the idea of care providers and care systems being accountable for ultimate healthcare outcomes, but I'm not particularly interested in that degree of specificity about how they get there; and then, so in the end, if you have some crosswalking measures around whether people are actually getting their anxiety and depression

detected, or whether they're not, and whether the people who are missing it are being held accountable for that, and then perhaps given this as a tool to improve, that's different than saying use this tool and that you somehow get the work done by using the tool. You get the work done by helping people with the actual problem and them getting better. So I would resist the idea that we monitor and measure the process, and instead, of monitoring and measuring, holding people accountable to the actual results

[Interviewer: the outcomes and seeing patients get better?] *seeing patients get better, and or lower suicide rates, or direct calls to patients that talk about their wellbeing having been addressed in their minds appropriately, or some kind of outcome measure rather than a process that would then become mandatory.*

Another provider wanted more evidence that these measures resulted in improved outcomes for her patients:

It's definitely mixed. I think that I would need to see more studies. I know that when I look at USPSTF guidelines on [this] that it's just very hard to research showing that asking these questions actually make a difference and so I feel like I would want to know that I'm doing it for a reason other than just jumping through hoops, like a clinically important reason. I would want to feel I have some support to offer in terms of patients making these behavioral changes. It's sometimes really hard to deal with data that you don't know how [to] change and that you do know is really important; and because especially with meaningful use, assessing is a certain point, but then...they start saying this number of people need to be counseled or this number of people need to have their meds reviewed, and so what exactly does that entail?

Many providers felt that it was unreasonable to place responsibility on them for these risk behaviors for a variety of reasons. One provider mentioned that she was not trained in medical school for behavior change work and that other professionals are better suited to the task:

I wasn't really trained in medical school...to do behavior change work...with patients and I may not be the best person to do it...I'm not sure that my expertise and my schooling and training are necessary to do behavior change work; I've worked with really great social workers and psychologists and clinical education specialists who do much better behavior change work than me and probably we need to think...about how are we going to bring in the right people to allow this to actually change outcomes as opposed to just to give us more data points.

Also, many of these risk behaviors are part of larger social issues and context, “I think that from a social justice perspective often times these things sort of reflect broader societal problems with socioeconomic disparities and access to safe places to exercise and good and healthy food.”

Many also noted that other, more fundamental changes had to occur in healthcare before linking providers to outcomes related to these risk behaviors. One provider said, “so it’s a great idea but it’s got to be tied to other fundamental, philosophical changes in how we define health services.”

Another said, “I don’t think we put enough emphasis on prevention in this country,” and “until we have a major paradigm shift in healthcare in this country we’re just going to continue to find ways around meaningful use which means we click the number [but] we don’t do it strictly.”

One provider summed up her opinion thusly,

until we fundamentally change our healthcare system so that primary care has a different role and prevention has a different role for the way that we sort of force people to march

through taking care of patients, we need to focus on the interventions that are going to have the highest yield for the highest number of patients that we take care of.

All of these perspectives with regards to mandating this policy recommendation were encapsulated by one provider when she said:

Sometimes the way it's presented to you in the dialogue, it dumps in [a] completely set of different text that meets the standard into the note...what you counseled on [was X but] then it puts in all that required text into the note. I think that...mandated quality measures can override what's important to the patient, so the patient comes in because he's having problems with his sex drive and he doesn't want to talk about physical activity, and here I am saying, I'm sorry we'll talk about that and it is related, but I'll get to that in a minute after I do this required element; it doesn't allow me to individualize care to what the patient needs and...patients have their stories to tell, and so you can't just throw this information at them and just [expect them to] wait for...you to get through it and they're not allowed to say anything. It's a back and forth, and so in order to give that due process you have to have a lot of time, you have to have somebody who can manage all of the information that comes to [them]. And then lastly I think the evidence base, it's a bad idea because some of this doesn't have great evidence for improving care; and so unless they're really going to provide hard outcome measures that tells me that if I assess a patient's stress level, that that improves their healthcare, then it's going to be harder for me to buy into [it and that] it's a valuable use of my time and plus it's just a huge burden that honestly doesn't sees the patient, it sees the numbers. And so [when] clinics [start to see] consequences attached, they will start figuring out how they

can make the measure but they may not be really paying attention to how it impacts the patient and so I think it can actually impair good patient care.

Chapter 5: Discussion

The Society's recommendation to include 17 behavioral measures into the EHR is generally accepted by primary care providers in this study. Most providers in this study "strongly recommend" inclusion of these measures but stop short of mandating its inclusion into the EHR. Providers in this study recognize that all of the risk behaviors suggested by the Society affect their patients' health such that all providers in this study currently collect most of the recommended domain items in different ways. Many of the currently collected risk behavior datasets are even more specific than what is recommended by the Society. Some of the elements are standardized in a format that is readily accessible while most are not, depending upon the practice. For many providers, one of the main concerns in incorporating these measures into the EHR is the dual need to revise their current EHR systems and their current workflow. In addition to this challenge, providers are unsure about the expectation for clinical decision making surrounding these measures. Though not opposed to the measures in general, a majority of providers wanted more information on the evidence base for the collection and utilization of these measures within the primary care setting. Many wanted more information on the effectiveness of collecting this information as it relates to improving their patients' well-being.

Time constraints and the need to balance the growing complexity of their patients' medical needs compel providers towards actionable information. However, almost all providers were willing to entertain an annual frequency in gathering this information; but practices would still need to revise their current EHR systems and clinical workflow to incorporate this recommendation, even annually. And though EHRs have been implemented in many of these providers' offices, as one provider said, "since we've turned on our EMR here five years ago, I

haven't seen us taken anything out of the workflow, right? I mean all we've done is add to the workflow."

One proposal suggested by several providers to mitigate constriction on providers' time is to include or engage the patient in the collection of these risk behaviors. If "patient engagement is the blockbuster drug of the century" (Dentzer, 2013; Kish, 2012), health systems may benefit from advancing this underutilized resource, and many providers in this study recognize this opportunity. A couple of providers suggested having tablets available for patients during their visit that they could use to enter their risk behaviors:

Ideally there would be a computer screen or [a] ...tablet device where the information could be tapped in and it would automatically populate into the EHR, I don't know of anything that will do that at the moment but that would be my ideal world.

if we had, when they check in [to] the front desk, they were issued [a tablet] and it'd have all these questions and they just kept it with them throughout their visit; and when I was talking I might say, "okay I want you to particularly do this or particularly do that," I'd take their [tablet] for a minute and give it back to them and have [them] watch a video while I type some information. That certainly would be doable; and then we'd presumably have some way to give them further access to that and so it wouldn't be dependent upon the hardware and we would have to send them links to these things; and there would be a virtual [tablet] on their home computer, that would be one way that would be a smooth way of doing [this] technologically.

In addition, collection of the Society's risk behaviors through a patient questionnaire fits within the National eHealth Collaborative's Patient Engagement Framework (National eHealth Collaborative, 2012), and their inclusion in the EHR would satisfy the patient generated health information requirement that is currently under review for Stage 3 Meaningful Use (Daniel, 2012). Correspondingly, these recommended measures should be considered in current proposals to collect risk behavior information for Medicare patients through an HRA tool to ensure harmonization across primary care settings.

However, as demonstrated by the experience of three providers in this study who currently collect variants of this information through an online self-administered HRA, challenges persists such as the low response rate, even from technically literate and English speaking patients. An additional challenge that needs consideration is how historical risk behavior information currently in the EHR and practice specific risk behavior information is incorporated into new standard data collection templates, if at all.

Downloading this information through a health exchange or personal health record was viewed skeptically by several providers. Providers had concerns about the data's validity and currency. Additionally, as several providers noted, the measures do not lend themselves to collection outside the point of care. Separately, based on the temporal nature for some of these measures, "in the last 7 days," "over the past two weeks," or "in the last 30 days," it is unclear how collecting patient responses annually for these measures would benefit patients. Patients may be better served when they are engaged on a more frequent basis about their behavioral risks.

Also, as many providers recommended, inquiring on a patient's readiness to change would be valuable to providers as well as patients. Understanding the patient's level of engagement in their risk behavior can help providers and healthcare systems to direct appropriate resources to their patients. All providers in this study recognize the need for patients to be directly engaged in modifying their risk behaviors, and many were concerned that inclusion of these risk behaviors into the EHR implied an expectation that they would be held accountable for their patient's health outcomes based on these risk behaviors. As several providers relayed, if documentation is meant to reflect the care that is given, then what are the "hard," "measurable" outcomes that are expected and how will providers be held accountable to some of the most intractable behaviors in their patients? Also, though recent research of current IBCTs show promise in engaging and improving patient diet and activity (Spring, Duncan, et al., 2012; Spring, Schneider, et al., 2012), initiation and support of these patient engagement tools may be limited by the medical necessity and complex care required during many primary care visits. And to repeat the sentiments of one provider in the study, facilitating adoption of these technologies may not be the best role for primary care providers. In summary, inquiring on a patient's readiness to change recognizes the need that patients need to be engaged for positive behavioral change.

Related to the implication that providers would be held accountable for their patient's health outcomes based on these risk behaviors, many of the providers saw these measures as sources of various chronic conditions. However, as an example, developing a chronic condition can lead to anxiety and depression, which could lead to other risk behaviors and chronic conditions. Given the complex dynamic between risk behaviors and multimorbidity, some of

these core data elements may be viewed as a form of patient reported outcome (PRO). Originally developed to provide clinical trials researchers information on the patient's perspective on a particular medical therapy that go beyond clinical measures of safety and efficacy (Patrick et al., 2007), PROs are being considered in the assessment of cancer patient care (Abernethy et al., 2010) and the evaluation of health system performance such as Accountable Care Organizations (ACO).

In fact, the National Quality Forum's (NQF) recent report on an ACO performance measurement project, PROs in Performance Measurement (2013), found some of the same themes uncovered in this study. Of the five Guiding Principles: psychometric soundness, patient centered, meaningful, amenable to change, and implementable, their amenable to change principle for the selection of PRO measures for performance measure elicited "robust discussion" among workshop participants. Amenable to change refers to evidence that the outcomes of interest are responsive to a specific healthcare service or intervention. Some participants felt that all PROs considered must be amenable to change whereas some participants felt that PROs are worth measuring even though they may not be amenable to change but nonetheless be valuable information to patients for shared decision making with their providers. The report concluded that various decisions need to be made about aspects of capturing PRO data such as mode of data collection, dates of data collection, sources of information as well as how best to display results and when and how alerts should appear. We hope that information in this study can also serve to assist the decision making surrounding PROs for performance measurement.

Regardless of whether the NQF selects certain PROs to measure performance of ACOs, providers within this study saw these risk behaviors as sources to multimorbidity. It would be interesting to gather providers' perspectives on these measures as forms of patient reported outcomes and how their viewpoints might shift if viewed from a different lens.

Limitations

As with any research study, this study has several limitations. One of the primary limitations in gathering provider opinions and perspectives were constraints on provider time. Out of respect for their busy schedules, interviews were kept as close to 30 minutes as possible. A couple providers graciously allowed the interviews to extend toward 45 minutes. However, because interviews were constrained to 30 minutes, this left little time to probe deeper into provider responses. Also, to reduce the burden on providers' and encourage participation, we did not take additional time to collect descriptive information on their patient population or specific practice; therefore we were unable to characterize our participants in terms of their own characteristics or those of their practices outside of what was given in the comments by providers.

Additionally, this study population may not be representative of primary care providers as a whole. The majority of providers in this study came from integrated group practices; only two providers listed themselves as solo practitioners. And, because the qualitative methods used in this study, conclusions cannot be drawn on the prevalence of providers' attitudes or differences in these attitudes according to the nature of their practice.

Lastly, some providers found some interview questions challenging especially if they were unfamiliar with the terminology. Examples of this included the question on downloading patient responses from a 'health information exchange' or 'health benefit exchange.' Unfamiliarity with these terms are expected since these organizational structures are evolving and will not be widely available until after full implementation of the Affordable Care Act in January of 2014. Providers also had difficulty with the question about their knowledge of interactive behavior change technologies as it relates to the 5A Framework. Lack of familiarity with either the technology or concepts may have bias the comments and resulted in ambiguity and uncertainty in their responses to these questions.

Conclusion

In the final analysis, the underlying question for all providers is how the inclusion of these risk behavior measures serves to support that fundamentally important provider and patient relationship? As with any relationship, the provider and patient relationship requires time to nurture trust. As primary care provider time has slowly eroded due to the complexity of today's healthcare system so too has the patient's trust. However, it is through a trusting relationship nurtured over time that may encourage patients to engage towards positive behavior change. Various technologies such as EHRs or other IBCTs can hinder or facilitate this relationship; however, it will require input from all stakeholders, providers and patients, to advance technology's ability to enrich the provider and patient relationship.

Lastly, as McGinnis and Foege revealed in 1993, risk behaviors lead to the actual causes of death through the development of multiple chronic conditions. Since then, we have also

realized the dynamic and complex relationship between multiple risk behaviors and multiple chronic conditions (Valderas, et al., 2009). The complex interactions between multiple chronic conditions and their risk behaviors lead to daily struggles by primary care providers to individualize care for their patients (Fried, Tinetti, & Iannone, 2011). These struggles occur within a context in which clinical practice guidelines have limited utility for patients with multiple chronic conditions such that many patients experience functional decline (American Geriatrics Society, 2012). Though the measures recommended by the Society may be helpful to prevent the development of many chronic conditions, as PROs, could they also be useful as rudimentary measures of patients' functional status as patients balance the potential benefit and harm associated with certain medical therapies? This may be the next question to ask as organizations begin to develop the second version of the Patient Centered Medical Home model.

References

- Abbo, E. D., Zhang, Q., Zelder, M., & Huang, E. S. (2008). The increasing number of clinical items addressed during the time of adult primary care visits. *J Gen Intern Med*, *23*(12), 2058-2065. doi: 10.1007/s11606-008-0805-8
- Abernethy, A. P., Ahmad, A., Zafar, S. Y., Wheeler, J. L., Reese, J. B., & Lyerly, H. K. (2010). Electronic patient-reported data capture as a foundation of rapid learning cancer care. *Med Care*, *48*(6 Suppl), S32-38. doi: 10.1097/MLR.0b013e3181db53a4 [doi]
- American Academy of Family Physicians. (2004). The new model of primary care: knowledge bought dearly. Washington DC: AAFP.
- American Geriatrics Society. (2012). Guiding principles for the care of older adults with multimorbidity: an approach for clinicians: American Geriatrics Society Expert Panel on the Care of Older Adults with Multimorbidity. *J Am Geriatr Soc*, *60*(10), E1-E25. doi: 10.1111/j.1532-5415.2012.04188.x [doi]
- Anderson, G. (2010). Chronic Care: Making the Case for Ongoing Care: Robert Wood Johnson Foundation.
- Aspy, C. B., Mold, J. W., Thompson, D. M., Blondell, R. D., Landers, P. S., Reilly, K. E., et al. (2008). Integrating Screening and Interventions for Unhealthy Behaviors into Primary Care Practices. *American Journal of Preventive Medicine*, *35*(5, Supplement), S373-S380. doi: 10.1016/j.amepre.2008.08.015
- Baron, R. (2010). What's Keeping Us So Busy in Primary Care? A Snapshot from One Practice. *New England Journal of Medicine*, *362*(17), 1632-1636. doi: doi:10.1056/NEJMon0910793

- Baron, R., Fabens, E. L., Schiffman, M., & Wolf, E. (2005). Electronic health records: just around the corner? Or over the cliff? *Ann Intern Med*, *143*(3), 222-226. doi: 143/3/222 [pii]
- Bayliss, E. A., Ellis, J. L., Shoup, J. A., Zeng, C., McQuillan, D. B., & Steiner, J. F. (2012). Association of Patient-Centered Outcomes With Patient-Reported and ICD-9–Based Morbidity Measures. *The Annals of Family Medicine*, *10*(2), 126-133. doi: 10.1370/afm.1364
- Bayliss, E. A., Ellis, J. L., & Steiner, J. F. (2009). Seniors' self-reported multimorbidity captured biopsychosocial factors not incorporated into two other data-based morbidity measures. *J Clin Epidemiol*, *62*(5), 550-557 e551. doi: S0895-4356(08)00117-0 [pii] 10.1016/j.jclinepi.2008.05.002
- Beasley, J. W., Hankey, T. H., Erickson, R., Stange, K. C., Mundt, M., Elliott, M., et al. (2004). How many problems do family physicians manage at each encounter? A WRen study. *Ann Fam Med*, *2*(5), 405-410.
- Bellows, N. M., McMenemy, S. B., & Halpin, H. A. (2010). Adoption of health promotion practices in a cohort of U.S. physician organizations. *Am J Prev Med*, *39*(6), 555-558. doi: S0749-3797(10)00470-8 [pii] 10.1016/j.amepre.2010.08.004
- Blumenthal, D. (2010). Launching HITECH. *N Engl J Med*, *362*(5), 382-385. doi: NEJMp0912825 [pii] 10.1056/NEJMp0912825

- Blumenthal, D. (2011). Implementation of the federal health information technology initiative. *N Engl J Med*, 365(25), 2426-2431. doi: 10.1056/NEJMSr1112158
- Blumenthal, D., & Tavenner, M. (2010). The "meaningful use" regulation for electronic health records. *N Engl J Med*, 363(6), 501-504. doi: NEJMp1006114 [pii]
10.1056/NEJMp1006114
- Bodenheimer, T., Wagner, E. H., & Grumbach, K. (2002a). Improving primary care for patients with chronic illness. *JAMA*, 288(14), 1775-1779. doi: jip21004 [pii]
- Bodenheimer, T., Wagner, E. H., & Grumbach, K. (2002b). Improving Primary Care for Patients With Chronic Illness: The Chronic Care Model, Part 2. *JAMA: The Journal of the American Medical Association*, 288(15), 1909. doi: 10.1001/jama.288.15.1909
- Borowitz, S. M., & Wyatt, J. C. (1998). The origin, content, and workload of e-mail consultations. *JAMA*, 280(15), 1321-1324. doi: joc80479 [pii]
- Boyd, C. M., Darer, J., Boulton, C., Fried, L. P., Boulton, L., & Wu, A. W. (2005). Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. *JAMA*, 294(6), 716-724. doi: 294/6/716 [pii]
10.1001/jama.294.6.716
- Breslow, L. (1998). Behavioral factors in the health status of urban populations. *J Urban Health*, 75(2), 242-250. doi: 10.1007/BF02345092
- Center for Medicare & Medicaid Services. (2011). *Chronic Conditions among Medicare Beneficiaries, Chartbook*. Baltimore, MD: Retrieved from
<http://www.cms.gov/TheChartSeries/Downloads/ChartbookFinal.pdf>.

- Cherry, D. K., & Woodwell, D. A. (2002). National Ambulatory Medical Care Survey: 2000 summary. *Adv Data*(328), 1-32.
- Cifuentes, M., Fernald, D. H., Green, L. A., Niebauer, L. J., Crabtree, B. F., Stange, K. C., et al. (2005). Prescription for Health: Changing Primary Care Practice to Foster Healthy Behaviors. *The Annals of Family Medicine*, 3(suppl 2), S4-S11. doi: 10.1370/afm.378
- Cohen, D. J., Balasubramanian, B. A., Isaacson, N. F., Clark, E. C., Etz, R. S., & Crabtree, B. F. (2011). Coordination of health behavior counseling in primary care. *Ann Fam Med*, 9(5), 406-415. doi: 9/5/406 [pii]
10.1370/afm.1245
- Cohen, D. J., Tallia, A. F., Crabtree, B. F., & Young, D. M. (2005). Implementing Health Behavior Change in Primary Care: Lessons From Prescription for Health. *The Annals of Family Medicine*, 3(suppl 2), S12-S19. doi: 10.1370/afm.334
- Daniel, J. (2012). *Comment Period Now Open: Help Set the Stage for Meaningful Use Stage 3*. Retrieved from http://www.healthit.gov/sites/default/files/hitpc_stage3_rfc_final.pdf.
- DeFriese, G. H., & Fielding, J. E. (1990). Health risk appraisal in the 1990s: opportunities, challenges, and expectations. *Annu Rev Public Health*, 11, 401-418. doi:
10.1146/annurev.pu.11.050190.002153
- Dentzer, S. (2013). Rx for the 'blockbuster drug' of patient engagement. *Health Aff (Millwood)*, 32(2), 202. doi: 32/2/202 [pii]
10.1377/hlthaff.2013.0037

Dickey, L. L., Gemson, D. H., & Carney, P. (1999). Office system interventions supporting primary care-based health behavior change counseling. *American Journal of Preventive Medicine*, 17(4), 299-308. doi: 10.1016/s0749-3797(99)00083-5

Estabrooks, P. A., Boyle, M., Emmons, K. M., Glasgow, R. E., Hesse, B. W., Kaplan, R. M., et al. (2012). Harmonized patient-reported data elements in the electronic health record: supporting meaningful use by primary care action on health behaviors and key psychosocial factors. *J Am Med Inform Assoc*. doi: amiajnl-2011-000576 [pii]

10.1136/amiajnl-2011-000576 [doi]

Etz, R. S., Cohen, D. J., Woolf, S. H., Holtrop, J. S., Donahue, K. E., Isaacson, N. F., et al. (2008). Bridging primary care practices and communities to promote healthy behaviors. *Am J Prev Med*, 35(5 Suppl), S390-397. doi: S0749-3797(08)00673-9 [pii]

10.1016/j.amepre.2008.08.008

Feinstein, A. R. (1970). The pre-therapeutic classification of co-morbidity in chronic disease. *Journal of Chronic Diseases*, 23(7), 455-468. doi: 10.1016/0021-9681(70)90054-8

Fine, L. J., Philogene, G. S., Gramling, R., Coups, E. J., & Sinha, S. (2004). Prevalence of multiple chronic disease risk factors. 2001 National Health Interview Survey. *Am J Prev Med*, 27(2 Suppl), 18-24. doi: 10.1016/j.amepre.2004.04.017

S0749379704000972 [pii]

Fisher, E. B., Fitzgibbon, M. L., Glasgow, R. E., Haire-Joshu, D., Hayman, L. L., Kaplan, R. M., et al. (2011). Behavior matters. *Am J Prev Med*, 40(5), e15-30. doi: S0749-3797(11)00089-4 [pii]

10.1016/j.amepre.2010.12.031 [doi]

Flocke, S. A., Frank, S. H., & Wenger, D. A. (2001). Addressing multiple problems in the family practice office visit. *J Fam Pract*, *50*(3), 211-216. doi: jfp_0301_02110 [pii]

Fortin, M., Dionne, J., Pinho, G., Gignac, J., Almirall, J., & Lapointe, L. (2006). Randomized controlled trials: do they have external validity for patients with multiple comorbidities? *Ann Fam Med*, *4*(2), 104-108. doi: 4/2/104 [pii]

10.1370/afm.516

Fortin, M., Stewart, M., Poitras, M.-E., Almirall, J., & Maddocks, H. (2012). A Systematic Review of Prevalence Studies on Multimorbidity: Toward a More Uniform Methodology. *The Annals of Family Medicine*, *10*(2), 142-151. doi: 10.1370/afm.1337

Fried, T. R., Tinetti, M. E., & Iannone, L. (2011). Primary care clinicians' experiences with treatment decision making for older persons with multiple conditions. *Arch Intern Med*, *171*(1), 75-80. doi: archinternmed.2010.318 [pii]

10.1001/archinternmed.2010.318 [doi]

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine Publishing Company.

Glasgow, R. E., Bull, S. S., Piette, J. D., & Steiner, J. F. (2004). Interactive behavior change technology. A partial solution to the competing demands of primary care. *Am J Prev Med*, *27*(2 Suppl), 80-87. doi: 10.1016/j.amepre.2004.04.026

S0749379704001060 [pii]

Glasgow, R. E., Kaplan, R. M., Ockene, J. K., Fisher, E. B., & Emmons, K. M. (2012). Patient-reported measures of psychosocial issues and health behavior should be added to electronic health records. *Health Aff (Millwood)*, *31*(3), 497-504. doi: 31/3/497 [pii]

10.1377/hlthaff.2010.1295 [doi]

Grant, R. W., Ashburner, J. M., Hong, C. C., Chang, Y., Barry, M. J., & Atlas, S. J. (2011).

Defining patient complexity from the primary care physician's perspective: a cohort study. *Ann Intern Med*, 155(12), 797-804. doi: 155/12/797 [pii]

10.1059/0003-4819-155-12-201112200-00001

Green, L. A., Fryer, G. E., Jr., Yawn, B. P., Lanier, D., & Dovey, S. M. (2001). The ecology of medical care revisited. *N Engl J Med*, 344(26), 2021-2025. doi:

10.1056/NEJM200106283442611

Guest, G., Bunce, A., & Johnson, L. (2006). How Many Interviews Are Enough? *Field Methods*, 18(1), 59-82. doi: 10.1177/1525822x05279903

Guralnik, J. M. (1996). Assessing the impact of comorbidity in the older population. *Ann Epidemiol*, 6(5), 376-380. doi: S1047279796000609 [pii]

Guralnik JM, L. A., Everett DF, Kovar MG. (1989). *Aging in the eighties: The prevalence of comorbidity and its association with disability. Advance Data*. (170). Hyattsville, Maryland.

Hing, E., Cherry, D. K., & Woodwell, D. A. (2006). National Ambulatory Medical Care Survey: 2004 summary. *Adv Data*(374), 1-33.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qual Health Res*, 15(9), 1277-1288. doi: 15/9/1277 [pii]

10.1177/1049732305276687

Huntley, A. L., Johnson, R., Purdy, S., Valderas, J. M., & Salisbury, C. (2012). Measures of Multimorbidity and Morbidity Burden for Use in Primary Care and Community Settings:

- A Systematic Review and Guide. *The Annals of Family Medicine*, 10(2), 134-141. doi: 10.1370/afm.1363
- Improving Chronic Illness Care. 5 A's Behavior Change Model Adapted for Self-Management Support Improvement: Robert Wood Johnson Foundation.
- Katerndahl, D., Wood, R., & Jaen, C. R. (2010). A method for estimating relative complexity of ambulatory care. *Ann Fam Med*, 8(4), 341-347. doi: 8/4/341 [pii]
10.1370/afm.1157
- Katerndahl, D., Wood, R., & Jaen, C. R. (2011). Family medicine outpatient encounters are more complex than those of cardiology and psychiatry. *J Am Board Fam Med*, 24(1), 6-15. doi: 24/1/6 [pii]
10.3122/jabfm.2011.01.100057
- Kerr, C., Nixon, A., & Wild, D. (2010). Assessing and demonstrating data saturation in qualitative inquiry supporting patient-reported outcomes research. *Expert Review of Pharmacoeconomics & Outcomes Research*, 10(3), 269-281. doi: 10.1586/erp.10.30
- Kish, L. (2012). The Blockbuster Drug of the Century: An Engaged Patient. *hl7standards.com*
Retrieved 3/21/2013, 2013, from <http://www.hl7standards.com/blog/2012/08/28/drug-of-the-century/>
- Landis, A. M., & Parker, K. P. (2007). A retrospective examination of the relationship between body mass index and polysomnographic measures of sleep in adolescents. *J Adolesc Health*, 40(1), 89-91. doi: S1054-139X(06)00268-0 [pii]
10.1016/j.jadohealth.2006.07.009

- Landis, A. M., Parker, K. P., & Dunbar, S. B. (2009). Sleep, hunger, satiety, food cravings, and caloric intake in adolescents. *J Nurs Scholarsh*, *41*(2), 115-123. doi: JNU1262 [pii] 10.1111/j.1547-5069.2009.01262.x
- Landis, C. A. (2002). Sleep and methods of assessment. *Nurs Clin North Am*, *37*(4), 583-597.
- Landis, C. A., Savage, M. V., Lentz, M. J., & Brengelmann, G. L. (1998). Sleep deprivation alters body temperature dynamics to mild cooling and heating not sweating threshold in women. *Sleep*, *21*(1), 101-108.
- Lugtenberg, M., Burgers, J. S., Clancy, C., Westert, G. P., & Schneider, E. C. (2011). Current guidelines have limited applicability to patients with comorbid conditions: a systematic analysis of evidence-based guidelines. *PLoS One*, *6*(10), e25987. doi: 10.1371/journal.pone.0025987
- PONE-D-11-08137 [pii]
- Marengoni, A., Angleman, S., Melis, R., Mangialasche, F., Karp, A., Garmen, A., et al. (2011). Aging with multimorbidity: a systematic review of the literature. *Ageing Res Rev*, *10*(4), 430-439. doi: S1568-1637(11)00024-9 [pii] 10.1016/j.arr.2011.03.003
- McDonald, S. E., Chapman T, Davies S, Pineda N, Lonhart J, Schmidt E, Wilson AB. (March 2012). *Prospects for Care Coordination Measurement Using Electronic Data Sources*. (12-0014-EF). Rockville, MD: AHRQ Retrieved from <http://www.ahrq.gov/qual/prospectscare/index.html>.
- McGinnis, J. M., & Foege, W. H. (1993). Actual causes of death in the United States. *JAMA*, *270*(18), 2207-2212.

McTigue, K. M., Bhargava, T., Bryce, C. L., Conroy, M., Fischer, G. S., Hess, R., et al. (2011).

Patient perspectives on the integration of an intensive online behavioral weight loss intervention into primary care. *Patient Educ Couns*, 83(2), 261-264. doi: S0738-3991(10)00294-6 [pii]

10.1016/j.pec.2010.05.009

Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States, 2000. *JAMA*, 291(10), 1238-1245. doi: 10.1001/jama.291.10.1238

291/10/1238 [pii]

Nardi, R., Scanelli, G., Corrao, S., Iori, I., Mathieu, G., & Cataldi Amatrian, R. (2007). Co-morbidity does not reflect complexity in internal medicine patients. *Eur J Intern Med*, 18(5), 359-368. doi: S0953-6205(07)00101-X [pii]

10.1016/j.ejim.2007.05.002

National eHealth Collaborative. (2012). The Patient Engagement Framework Retrieved March 4, 2013, 2013, from <http://www.nationalehealth.org/patient-engagement-framework>

National Quality Forum. (2013). Patient Reported Outcomes (PROs) in Performance Measurement: National Quality Forum.

O'Connor, P. J., Rush, W. A., Prochaska, J. O., Pronk, N. P., & Boyle, R. G. (2001). Professional advice and readiness to change behavioral risk factors among members of a managed care organization. *Am J Manag Care*, 7(2), 125-130. doi: 651 [pii]

Patrick, D. L., Burke, L. B., Powers, J. H., Scott, J. A., Rock, E. P., Dawisha, S., et al. (2007).

Patient-reported outcomes to support medical product labeling claims: FDA perspective. *Value Health*, 10 Suppl 2, S125-137. doi: VHE275 [pii]

10.1111/j.1524-4733.2007.00275.x [doi]

Pronk, N. P., Peek, C. J., & Goldstein, M. G. (2004). Addressing multiple behavioral risk factors in primary care. A synthesis of current knowledge and stakeholder dialogue sessions. *Am J Prev Med*, 27(2 Suppl), 4-17. doi: 10.1016/j.amepre.2004.04.024

S0749379704001047 [pii]

Rothemich, S. F., Woolf, S. H., Johnson, R. E., & Marsland, D. W. (2000). Evaluating the administration of an office-based health survey in a primary care practice. *J Clin Epidemiol*, 53(10), 1002-1012. doi: S0895-4356(00)00195-5 [pii]

Sandelowski, M. (1995). Sample size in qualitative research. *Res Nurs Health*, 18(2), 179-183.

Schoenberg, N. E., Bardach, S. H., Manchikanti, K. N., & Goodenow, A. C. (2011). Appalachian residents' experiences with and management of multiple morbidity. *Qual Health Res*, 21(5), 601-611. doi: 1049732310395779 [pii]

10.1177/1049732310395779

Schoenberg, N. E., Leach, C., & Edwards, W. (2009). "It's a toss up between my hearing, my heart, and my hip": prioritizing and accommodating multiple morbidities by vulnerable older adults. *J Health Care Poor Underserved*, 20(1), 134-151. doi: S1548686908100158 [pii]

10.1353/hpu.0.0115

Sciamanna, C. N., Marcus, B. H., Goldstein, M. G., Lawrence, K., Swartz, S., Bock, B., et al. (2004). Feasibility of incorporating computer-tailored health behaviour communications in primary care settings. *Inform Prim Care*, 12(1), 40-48.

Smith, S. M., Soubhi, H., Fortin, M., Hudon, C., & O'Dowd, T. (2012). Interventions for improving outcomes in patients with multimorbidity in primary care and community settings. *Cochrane Database Syst Rev*, 4, CD006560. doi: 10.1002/14651858.CD006560.pub2

Society of Behavioral Medicine. (2013), from <http://www.sbm.org/about>

Spring, B., Duncan, J. M., Janke, E. A., Kozak, A. T., McFadden, H. G., Demott, A., et al. (2012). Integrating Technology Into Standard Weight Loss Treatment: A Randomized Controlled Trial. *Arch Intern Med*, 1-7. doi: 1485082 [pii]

10.1001/jamainternmed.2013.1221 [doi]

Spring, B., Schneider, K., McFadden, H. G., Vaughn, J., Kozak, A. T., Smith, M., et al. (2012). Multiple behavior changes in diet and activity: a randomized controlled trial using mobile technology. *Arch Intern Med*, 172(10), 789-796. doi: 1170044 [pii]

10.1001/archinternmed.2012.1044 [doi]

Stange, K. C., Jaen, C. R., Flocke, S. A., Miller, W. L., Crabtree, B. F., & Zyzanski, S. J. (1998). The value of a family physician. *J Fam Pract*, 46(5), 363-368.

Starfield, B. (2006). Threads and yarns: weaving the tapestry of comorbidity. *Ann Fam Med*, 4(2), 101-103. doi: 4/2/101 [pii]

10.1370/afm.524

Starfield, B., Lemke, K. W., Bernhardt, T., Foldes, S. S., Forrest, C. B., & Weiner, J. P. (2003). Comorbidity: Implications for the Importance of Primary Care in 'Case' Management. *The Annals of Family Medicine*, 1(1), 8-14. doi: 10.1370/afm.1

Stille, C. J., Jerant, A., Bell, D., Meltzer, D., & Elmore, J. G. (2005). Coordinating care across diseases, settings, and clinicians: a key role for the generalist in practice. *Ann Intern Med*, *142*(8), 700-708. doi: 142/8/700 [pii]

The Physicians Foundation. (2008). *A Survey of America's Physicians: Practice Patterns and Perspectives*: The Physicians Foundation.

The Physicians Foundation. (2012). *A Survey of America's Physicians: Practice Patterns and Perspectives*: The Physicians Foundation.

Tinetti, M. E., Bogardus, S. T., Jr., & Agostini, J. V. (2004). Potential pitfalls of disease-specific guidelines for patients with multiple conditions. *N Engl J Med*, *351*(27), 2870-2874. doi: 351/27/2870 [pii]

10.1056/NEJMs042458

Tinetti, M. E., McAvay, G. J., Fried, T. R., Foody, J. M., Bianco, L., Ginter, S., et al. (2008). Development of a tool for eliciting patient priority from among competing cardiovascular disease, medication-symptoms, and fall injury outcomes. *J Am Geriatr Soc*, *56*(4), 730-736. doi: JGS1627 [pii]

10.1111/j.1532-5415.2007.01627.x

US Department of Health and Human Services. (2010). *Multiple Chronic Conditions—A Strategic Framework: Optimum Health and Quality of Life for Individuals with Multiple Chronic Conditions*. Retrieved from http://www.hhs.gov/ash/initiatives/mcc/mcc_framework.pdf.

- Valderas, J. M., Starfield, B., Sibbald, B., Salisbury, C., & Roland, M. (2009). Defining Comorbidity: Implications for Understanding Health and Health Services. *The Annals of Family Medicine*, 7(4), 357-363. doi: 10.1370/afm.983
- van den Akker, M., Buntinx, F., Metsemakers, J. F., Roos, S., & Knottnerus, J. A. (1998). Multimorbidity in general practice: prevalence, incidence, and determinants of co-occurring chronic and recurrent diseases. *J Clin Epidemiol*, 51(5), 367-375. doi: S0895-4356(97)00306-5 [pii]
- Verbrugge, L. M., Lepkowski, J. M., & Imanaka, Y. (1989). Comorbidity and its impact on disability. *Milbank Q*, 67(3-4), 450-484.
- Wagner, E. H., Austin, B. T., & Von Korff, M. (1996). Organizing Care for Patients with Chronic Illness. *The Milbank quarterly*, 74(4), 511.
- Whitlock, E. P., Orleans, C. T., Pender, N., & Allan, J. (2002). Evaluating primary care behavioral counseling interventions: an evidence-based approach. *Am J Prev Med*, 22(4), 267-284. doi: S0749379702004154 [pii]
- Williams, R. B., Boles, M., & Johnson, R. E. (1995). Patient use of a computer for prevention in primary care practice. *Patient Educ Couns*, 25(3), 283-292. doi: 073839919500800F [pii]
- Wolff, J. L., Starfield, B., & Anderson, G. (2002). Prevalence, expenditures, and complications of multiple chronic conditions in the elderly. *Arch Intern Med*, 162(20), 2269-2276. doi: ioi20083 [pii]
- Woolf, S. H., Krist, A. H., Johnson, R. E., Wilson, D. B., Rothemich, S. F., Norman, G. J., et al. (2006). A practice-sponsored Web site to help patients pursue healthy behaviors: an ACORN study. *Ann Fam Med*, 4(2), 148-152. doi: 4/2/148 [pii]

10.1370/afm.522

Zickmund, S. (2009). Methodological Issues in Mixed Methods Data: The Use of Qualitative and Quantitative Data in Health Service Research.

Zickmund, S., Hess, R., Bryce, C. L., McTigue, K., Olshansky, E., Fitzgerald, K., et al. (2008). Interest in the use of computerized patient portals: role of the provider-patient relationship. *J Gen Intern Med*, 23 Suppl 1, 20-26. doi: 10.1007/s11606-007-0273-6 [doi]