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MEASURING PRIMARY CARE ENGAGEMENT IN EMERGENCY DEPARTMENT  
PATIENTS IN A MEDICALLY UNDERSERVED AREA

by

Bianca Michelle Jackson

A Thesis

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Public Health

The University of Memphis

May 2015

## **ABSTRACT**

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Measuring Primary Care Engagement in Emergency Department Patients in a Medically Underserved Area. Major Professor: Dr. Erik L. Carlton

The purpose of this study was to evaluate primary care engagement in an emergency department population of adults with diabetes and multiple chronic conditions (MCC) within the medically underserved Whitehaven community of Memphis, TN. Using a self-report survey, primary care characteristics of the population and the validity of the local hospital registrar's assessment of primary care engagement were evaluated using descriptive statistics, independent sample t-tests, one-way ANOVA, and bivariate correlations. 83% of patients reported having a primary care provider. There was no effect of age, gender, or race on continuity of care or chronic illness care; however, insurance status did influence continuity of care. There was discordance between hospital registrar data and self-reports of primary care status. Facilitation of community programs that emphasize health coaching, combined with primary care, may help to improve coordination of care, reduce the high prevalence of people with diabetes and MCC, and improve quality of life.

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## **Introduction**

As a consequence of increased obesity, sedentary lifestyle, and aging populations, diabetes affects at least 171 million people worldwide, and is dramatically increasing in many countries.<sup>1</sup> With nearly 29.1 million Americans suffering from this condition, diabetes remains the seventh leading cause of death in the United States in 2010, with 69,071 of deaths attributed diabetes as the underlying cause of death, and a total of 234,051 deaths listing diabetes as an underlying or contributing cause of death.<sup>2</sup> Since diabetes serves as a platform for onset of other diseases, over 75% of people with diabetes have two or more chronic conditions.<sup>3</sup> The high prevalence of multiple chronic conditions (MCC) has warranted much attention. Increased efforts in coordination of care from clinicians, public health, and social programs are essential in order to improve quality of life for people with MCC.<sup>4</sup>

Certain population subgroups are at higher risk of acquiring diabetes, such as non-white ethno-racial groups and populations of low socioeconomic status, particularly in medically underserved areas (MUA).<sup>5</sup> The Health Resources and Services Administration (HRSA) has designated 4,188 medically underserved areas/population and defines a MUA as “a whole county or a group of contiguous counties, a group of county or civil divisions, or a group of urban census tracts in which residents have a shortage of personal health services; and Medically Underserved Populations (MUPs) as “groups of persons who face economic, cultural or linguistic barriers to health care.”<sup>6</sup> The social disadvantage that these groups endure contributes to the increased rate of obesity and cardiovascular and pulmonary diseases, conditions that are often exacerbated with

learning difficulties and poor quality of life.”<sup>7</sup> Furthermore, physicians may be discouraged from practicing in these areas due to the high disease rates, low compliance rates, and high treatment failure rates.<sup>7</sup> This results in the geographic maldistribution of physicians, especially in rural or inner cities.<sup>8</sup> Consequently, the previously estimated 43 million Americans who reside in medically underserved areas look to other sources of care including local emergency rooms, hospital outpatient departments, clinics or health centers, and perhaps, expanding managed care programs.<sup>9</sup>

The Whitehaven community of Memphis, TN (Shelby County, zip code 38109) is one of the most pauperized and medically underserved urban areas in the U.S. With some of the highest prevalence rates of obesity, diabetes, and hospital readmissions in the Memphis Metropolitan Statistical Area, this community has been geographically recognized for its cornucopia of chronic conditions.<sup>10</sup> Data compiled from a 2004 and 2005 Memphis Behavioral Factor Survey revealed that the Whitehaven community consisted of a population that was nearly 50% obese, had an average BMI 28.1, and 14.3% and 49.6% prevalence rates of diabetes and hypertension, respectively.<sup>11</sup> 30.5% of individuals in this area live below the poverty level.<sup>12</sup>

The result of such socioeconomic inequality exposes vulnerable populations like the Whitehaven community to barriers not only in accessing, but also receiving quality primary care. About 2.5% to 10.4% of people with diabetes lack a usual source of care.<sup>13-</sup><sup>14</sup> Even for individuals with a usual source, 30% of diabetics report delaying needed care within the last year due to inadequate or unsatisfactory primary care engagement.<sup>13-15</sup> This deficiency contributes to the rehospitalization and readmission of persons with diabetes, as well as persons with other chronic conditions. For chronically ill patients,

readmission to the hospital can be recurrent and expensive, accounting for up to half of all hospitalizations and 60 percent of hospital costs. In addition to exacerbated expenses, readmissions may also reflect poor-quality care.<sup>16</sup>

Over the past 20 years, the responsibility for the care of diabetes patients has shifted from hospitals to primary care.<sup>17</sup> The Institute of Medicine states that primary care is “the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients and practicing within the context of family and community”.<sup>18</sup> If realized in practice, these defining features of primary care—that is, continuity, comprehensiveness, and coordination—match the care needs of chronically ill persons.<sup>19</sup> Primary care plays an essential role in chronic illness care, but system support and improvements are critical to its success. As \$245 billion in health care expenditures are attributed to diabetes diagnosis, larger, structural interventions have been implemented to improve the process of care for diabetes patients.<sup>20</sup>

Studies have shown that multifaceted professional interventions and organizational interventions that facilitate structured and regular review of patients were effective in improving the process and access of care.<sup>18</sup> Studies have also revealed that improving access to care is more likely to reduce hospitalization rates for chronic conditions, in comparison to other potential pathways of improvement, such as “changing patients' propensity to seek health care or eliminating variation in physician practice style.”<sup>21</sup> Other studies have evaluated diabetes care from the perspective of providers, by assessing their attitudes and perceptions to reveal barriers and challenges that they face when implementing and providing diabetes care. They revealed explanatory themes

underlying provider frustrations with diabetes, including characteristics of the disease itself and the complexity of its management and a perceived lack of support from society and the health care system for their efforts to control diabetes.”<sup>22</sup> These findings provide support in the success of improvements in accessibility and delivery of diabetes-specific services, yet, there is still a lingering need of both in MUAs. Meeting the service needs of medically underserved areas and populations, such as the Whitehaven community, is one of the major challenges facing the U.S. health care system today.

Most of literature surrounding usual source of care concludes that such care is independently associated with better receipt of diabetes-specific services.<sup>13-14</sup> This is attributed to better access to healthcare and reports of increased preventive services, decreased use of emergency services, and shorter hospital stays.<sup>14</sup> The current methodology utilized by hospitals may vary in accurately conveying the nature of the patient-primary care provider interaction when asking the question “Do you have a primary care provider?” to a patient. Since hospitals rely on this information to use for post-hospital referrals, it is important that the recorded information is accurate and reflects the true relationship between a patient and a primary care provider. Various questionnaires have been previously developed to measure the association of patient-provider primary care engagement and health outcomes. There have also been studies done to evaluate the accuracy of patient self-reports of various chronic conditions against physical examinations, medical records, and disease registries.<sup>23-28</sup> However, no studies have been done to validate the accuracy of general hospital registrar data surrounding primary care engagement.

The purpose of this study is to evaluate primary care engagement in an emergency department population of adults with diabetes and MCC within the medically underserved Whitehaven community. Specifically, the study aims to: (1) describe the level of primary care involvement of diabetic patients with MCC, (2) identify the factors that influence communication and relationships with diabetic patients with MCC and primary care providers, and (3) assess the concordance of a 47-item self-report survey with the recorded registrar hospital assessments of primary care engagement in an emergency department population of adults with diabetes and multiple chronic conditions. In order to adhere to healthcare's paradigm shift to a more patient-centered health system, understanding the levels of primary care engagement could contribute to improved clinical decision-making, healthcare delivery, health outcomes, and a potential decrease in healthcare costs.

## **Methods**

### *Study Population*

The eligible study population includes all patients from the Methodist South Hospital emergency department with clinically diagnosed diabetes and MCC. The fifteen chronic conditions of the Centers for Medicare & Medicaid Services Chronic Condition Data Warehouse that satisfied the definition and criteria established by Goodman and colleagues<sup>4,29</sup>, were used for this study (Table 1). Persons of any race or gender who are 40 - 75 years of age qualified for this study. Patients were excluded if they were: 1) unable to participate in the survey because of critical illness, decreased level of consciousness or cognitive disability, or lack of English language proficiency; 2) had not

been diagnosed with diabetes and multiple chronic conditions; or 3) were below the age of 40 or over the age of 75. With the approval of the Institutional Review Board of The University of Tennessee Health Science Center and Methodist LeBonheur Healthcare, questionnaires were administered to active patients in the Methodist South Hospital Emergency Department.

**Table 1. Chronic Condition Categories**

Anemia	Chronic Obstructive Pulmonary Disease
Arthritis	Congestive Heart Failure
Asthma	Coronary Artery Disease
Benign Prostatic Hyperplasia	Dementia
Breast Cancer	Depression
Colorectal Cancer	Glaucoma
Endometrial Cancer	Hip/Pelvic Fracture
Lung Cancer	Hyperlipidemia
Prostate Cancer	Hypertension
Cardiac Arrhythmias	Ischemic Heart Disease
Cataract	Osteoporosis
Chronic Kidney Disease	Stroke/ Transient Ischemic Attack

#### *Data Collection*

From January to February 2015, active patients in the Methodist South Emergency Department (ED) underwent preliminary chart review, done by a Methodist South ED nurse in collaboration with the study primary investigator to evaluate study eligibility. If eligible, patients were asked to participate, provided with a copy of the survey, and encouraged to read the consent statement. Their completion of the survey demonstrated their consent to participate. Assistance with completion of the survey was provided as needed by the primary investigator or family members of the patient. After completion of the survey, the survey was collected, and attached to Patient Participant

Eligibility Screening. The patient's chronic condition history, primary care status, name of primary care provider, insurance status, and insurance type were collected from the medical record and recorded on the attached Patient Participant Eligibility Screening form. Arbitrary ID numbers were assigned to each patient and used to ensure the Patient Participant Eligibility Screening form and completed patient survey reflected the same patient.

### *Questionnaire*

The Patient Survey (see Appendix A) included the following components: demographic information: age, sex, race/ethnicity, and highest level of education; original survey items; 2013 National Health Interview Survey items<sup>30</sup>; the Patient Assessment of Chronic Illness Care Questionnaire (PACIC)<sup>31</sup>; a modified version of the Nijmegen Continuity of Care Questionnaire<sup>32</sup>; and original items regarding health literacy, cellphone, smart phone, and texting use, and interest in health coaching. Previously developed questionnaires were openly accessible for public use.

Specific items from the Adult Access to Health Care & Utilization database of the 2013 version of National Health Interview Survey<sup>30</sup>, were utilized and kept in original form.

Items from Nijmegen Continuity Questionnaire pertaining to patient-provider relationship of "the most important provider in general practice" were isolated from the original questionnaire<sup>32</sup>. A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used to rate items. Uijen and colleagues demonstrated high test-retest reliability, as the intraclass correlation coefficient (ICC) varied between 0.71 and

0.82, as well as construct validity “through expected correlations with other variables and discriminative ability through expected differences in continuity sub-scores of different subgroups.”<sup>33</sup> A reliability ICC of  $>.70$  was considered acceptable.<sup>34</sup> Internal consistency (Cronbach  $\alpha$ ) ranged from 0.82 to 0.89 for original subscales.<sup>33</sup>

The PACIC survey is a self-report that measures specific actions or quality of cares based on the Chronic Care Model<sup>31,35</sup>. It includes 20 items with 5 subscales: patient activation [items 1-3], delivery system design and support [items 4-6], goal setting and tailoring [items 7-11], problem-solving and contextual counseling [items 12-15], and follow-up and coordination [items 16-20)].<sup>31</sup> The original version of PACIC was used for this study. Internal consistency (Cronbach  $\alpha$ ) was 0.93 for the overall scale, and 0.82, 0.77, 0.84, 0.90, and 0.86 for patient activation, delivery system design/ decision support, goal setting/tailoring, problem solving/contextual, and follow-up/coordination, respectively.<sup>31</sup> Glasgow and colleagues tested the questionnaire and found the subscales to be internally consistent ( $\alpha$  for overall scale = 0.93), moderately reliable over time ( $r = 0.58$  over 3 months), and to have moderately stable test-retest validity.<sup>31</sup>

### *Statistical Analysis*

Descriptive statistics included frequencies and percentages for demographics (gender, race/ethnicity, education level) and for each questionnaire item. To further assess the associations between various factors and primary care engagement, bivariate (Pearson) correlations, independent sample t-tests, and one-way ANOVA were utilized. Bivariate correlations were conducted to assess associations between age and overall mean scores for the modified Nijmegen Continuity Questionnaire and PACIC scales.

Independent sample t-tests were conducted to compare gender and insurance status with overall mean scale scores for both scales, while ANOVA was used to evaluate potential differences among age and race groups with overall mean scale scores for both scales. Reliability of scales was evaluated using Cronbach  $\alpha$ . All statistical analyses were carried out in IBM SPSS version 21.0.

## **Results**

### *Sample Characteristics*

272 patients were screened, 55 were eligible, and 30 participated in the survey, for a 55% participation rate. The remaining 25 patients who may have qualified but did not participate were critically ill, in a state of altered mental status, or discharged before survey could be administered. All survey questions were not answered by every participant, thus the n-value for survey items may vary. Among the patient self-reports of the study sample, 20 (66.7%) were female, and 10 (33.3%) were male. Patient age ranged from 40 to 74 years. The majority of patients identified as black/African-American (90%), the remaining 10% identified as White/Caucasian. None of the patients identified as Hispanic. There were varied responses for patient education level (Table 2). A majority of participants attended college for 1 to 3 years (37.9%), 24.1% attended up to grade 12 or acquired a GED, 17.2% attended up to grades 9 to 11, 13.8% grades 1 to 8, and 6.9% attended 4 or more years of college. There were a variety of chronic conditions extracted from patient medical records. Patients past medical histories included: 10% anemia, 20% arthritis, 3.3% asthma, 13.3% cancer, 16.7% chronic kidney disease, 3.3%

chronic obstructive pulmonary disease (COPD), 13.3% congestive heart failure, 3.3% coronary artery disease, 6.7% depression, 43.3% hyperlipidemia, 76.7% hypertension, and 20% stroke/transient ischemic attack. 83.3% of patients had health insurance while in the ED. Of the patients who had insurance, insurance types included: 16.7% TennCare, 23.3% Medicare, 23.3% Medicare/Medicaid, and 20% Privately Insured.

**Table 2. Patient Characteristics**

<b>Gender (n=30)</b>	<b>N</b>	<b>%</b>
Female	19	63.3
Male	11	36.7
<b>Race/Ethnicity (n=30)</b>		
Non-Hispanic White	3	10
Non-Hispanic Black	27	90
<b>Education (n=29)</b>		
Grades 1-8	4	13.8
Grades 9-11	5	17.2
Grades 12 or GED*	7	24.1
College 1-3 years	11	37.9
College 4 or more years	2	6.9
<b>Chronic Condition (n=30)</b>		
Arthritis	6	20.0
Asthma	4	13.3
Benign Prostatic Hyperplasia		
Cancer	4	13.3
Chronic Kidney Disease	5	16.7
COPD	1	3.3
Congestive Heart Failure	4	13.3
Coronary Artery Disease	1	3.3
Depression	2	6.7
Diabetes	30	100
Hyperlipidemia	13	43.3
Hypertension	23	76.7
Stroke/Transient Ischemic Attack	6	20.0
<b>Insurance Status (n=29)</b>		
Insured	25	83.3
Uninsured	4	13.3
<b>Insurance Type (n=25)</b>		
TennCare	5	16.7
Medicare	7	23.3
Dual Eligible	7	23.3
Private Insurance	6	20.0

\*GED=General Education Development Test

### *Primary Care Assessment*

According to patient-self report, 83.3% of patients had a primary care doctor, while 16.7% did not have a primary care doctor (Table 3). 73% of patients that reported having a PCP knew the provider name, 13.8% did not know the provider name but knew the name of the clinic, and 10% did not know the name of their PCP. According to PCP status recorded from medical records, 72.4% of patients reported having a primary care provider to the registrar, while 27.6% did not report having a primary care provider.

86.7% of patients reported seeing a primary care provider within the last year, 30% had seen a nurse practitioner, and 6.7% had seen a physician assistant. 70% had seen a specialist in the past year, while 30% had not seen a specialist in the past year. A large proportion of the patients had seen a primary care provider 3 to 4 times in the past year (46.7%), 16.7% 1 to 2 times, 16.7% 5 to 6 times, and 20% more than 6 times. 90% of patients reported having a usual source of care when sick, 6.7% did not. For those that did not have a usual source when sick (6.7%), they reported that the doctor was “unavailable/moved” or the patient was in transition from nursing home care. Patients that reported having a usual source of care primarily went to a doctor’s office or HMO (51.7%). 20.7% went to a clinic or health center, 13.8% the hospital emergency room, 10.3% the hospital outpatient department, and 3.4% did not go to one place most often. 90% reported usually going to that usual source of care for routine or preventive care.

**Table 3. Primary Care Assessment**

	N	%
<b>Having PCP*(n=30)</b>		
Yes	25	83.3
No	5	16.7
<b>Knowing Name of PCP (n=29)</b>		
Yes	22	73.3
No, but knows clinic name	4	13.8
No	3	10.0
<b>Having Seen PCP, NP*, and/or PA* for Primary Care in Past Year (n=30)</b>		
Primary Care Physician	26	86.7
Nurse Practitioner	9	30.0
Physician Assistant	2	6.7
<b>Having Seen Specialist in Past Year (n=30)</b>		
Yes	21	70.0
No	9	30.0
<b>Number of Times Having Seen a Primary Care Provider Past Year (n=30)</b>		
1-2 times	5	16.7
3-4 times	14	46.7
5-6 times	5	16.7
More than 6 times	6	20.0
<b>Having a Usual Source of Care When Sick or Need Advice (n=30)</b>	N	%
Yes	27	90.0
No	2	6.7
Don't Know	1	3.3
<b>Reasons Why Patient Does Not Have Usual Source When Sick or Need Advice (n=2)</b>		
Previous doctor is not available/moved	1	3.3
Other	1	3.3
<b>Type of Usual Source When Sick or Need Medical Advice (n=29)</b>		
Clinic or health center	6	20.7
Doctor's office or HMO*	15	51.7
Hospital emergency room	4	13.8
Hospital outpatient department	3	10.3
Do not go to one place most often	1	3.4
<b>Usual Source of Care Same Place as Usual Source for Preventive Care (n=30)</b>		
Yes	27	90.0
No	3	10.0

**Table 3. Primary Care Assessment (Continued)**

<b>Usual Source for Preventive Care (n=30)</b>	<b>N</b>	<b>%</b>
Clinic or health center	8	26.7
Doctor's office or HMO	19	63.3
Hospital outpatient department	2	6.7
Do not go to one place most often	1	3.3

\*PCP=Primary Care Provider, NP=Nurse Practitioner; PA=Physician Assistant; HMO=Health Maintenance Organization

#### *Reasons for Delaying Needed Care*

Although a majority of the patients reported not having to delay needed care in the past year for the listed reasons, there were some patients who did delay needed care (Table 4). 13.8% delayed needed care in the past year because they could not get through on the phone, 29.6% could not get an appointment soon enough, 18.5% had to wait too long to see a doctor, 22.2% reported the clinic/doctor's office was not open when the patient could get there, and 26.9% did not have transportation.

**Table 4. Reasons for Delaying Needed Care**

	<b>Yes (%)</b>	<b>No (%)</b>	<b>Do not know (%)</b>
Could not get through on the phone (n=29)	4 (13.8)	24 (82.8)	1 (3.4)
Could not get an appointment soon enough (n=27)	8 (29.6)	19 (70.4)	0 (0.0)
Too long of a wait to see the doctor (n=27)	5 (18.5)	22 (81.5)	0 (0.0)
The clinic/doctor's office was not open (n=27)	6 (22.2)	20 (74.1)	1 (3.7)
Did not have transportation (n=26)	7 (26.9)	19 (73.1)	0 (0.0)

### *Health Literacy*

Health literacy, cell phone, smart phone, and text message usage were assessed (Table 5). Nearly half (48.1%) of patients reported being extremely comfortable filling out medical forms by themselves, 7.4% “quite a bit”, 14.8% “somewhat”, 18.5% “a little”, and 11.1% “not at all.”

### *Cell Phone Use*

92.9% of patients currently using a cell phone, and 76.9% of those were smart phones, while 23.1% were not smart phones (Table 5). Half of patients with cell phones (both smart and non-smart phones) reported sending or receiving text messages one or more time a day, 20.8% one or more times a week, 8.3% one or more times a month, and 20.8% never sent or received text messages.

### *Health Coaching*

There was a general strong interest in receiving text messages from the doctor’s office (Table 5). 73% reported being “very” or “somewhat” interested in receiving text messages, while 26.9% were not interested. Similarly, 88% of patients were “very” or “somewhat” interested in meeting with a health coach to help reach health goals, and 12% were not interested.

**Table 5. Health Literacy & Cell/Smart Phone & Text Message Use & Health Services Interests**

<b>Health Literacy</b>	<b>N</b>	<b>%</b>
<b>Comfort Level Completing Medical (n=27)</b>		
Extremely	13	48.1
Quite a bit	2	7.4
Somewhat	4	14.8
A little	5	18.5
Not at all	3	11.1
<b>Cell Phone/Text Message Use</b>		
<b>Currently Using Cell Phone (n=28)</b>		
Yes	26	92.9
No	2	7.1
<b>Currently Using Smart Phone (n=26)</b>		
Yes	20	76.9
No	6	23.1
<b>Frequency of Sending or Receiving Text Messages (n=24)</b>		
One or more times a day	12	50.0
One or more times a week	5	20.8
One or more times a month	2	8.3
Less than once a month		
Never	5	20.8
<b>Health Services Interests</b>		
<b>Interest in Receiving Text Messages Doctor's Office (n=26)</b>		
Very Interested	16	61.5
Somewhat Interested	3	11.5
Not at all interested	7	26.9
<b>Interest in Health Coach (n=25)</b>		
Very Interested	16	64.0
Somewhat Interested	6	24.0
Not at all interested	3	12.0

### *Nijmegen Continuity Questionnaire*

Overall patients reported a strong continuity of care (Table 6). There was strong communication between patient and provider as 24.1-51.7% of patients responded with “strongly agree” or “agree” to all continuity survey items. 51.7% of patients strongly agreed that their provider knew their medical history very well. Similarly, nearly half of patients (48.3%) strongly agreed that their provider knew what was important to their care. No more than 13.8% of patients responded “disagree” or “strongly disagree” to any given item in this section.

**Table 6. Nijmegen Continuity Questionnaire**

<b>Survey Item</b>	<b>Strongly Agree (1)</b>	<b>Agree (2)</b>	<b>Neutral (3)</b>	<b>Disagree (4)</b>	<b>Strongly Disagree (5)</b>
1. Knew regular doctor/PCP* very well	9 (31.0)	13 (44.8)	4 (13.8)	2 (6.9)	1 (3.4)
2. Patient regular doctor/PCP knew patient medical history very well	15 (51.7)	10 (34.5)	2 (6.9)	2 (6.9)	0 (0.0)
3. Patient regular doctor/primary care provider always knew what he/she did previously	13 (44.8)	11 (37.9)	3 (10.3)	2 (6.9)	0 (0.0)
4. Regular doctor/primary care provider knew patient familial circumstances very well	12 (41.4)	10 (34.5)	3 (10.3)	3 (10.0)	1 (3.4)
5. Regular doctor/primary care provider knew daily activities very well	10 (34.5)	7 (24.1)	5 (17.2)	4 (13.8)	3 (10.3)
6. Regular doctor/primary care provider contacted patient without being asked	9 (31.0)	7 (24.1)	5 (17.2)	4 (13.8)	4 (13.8)
7. Regular doctor/primary care provider knew very well what patient believe is important in care	14 (48.3)	7 (24.1)	2 (6.9)	3 (10.3)	3 (10.3)
8. Regular doctor/primary care provider kept in contact sufficiently when patient saw other care providers	11 (37.9)	9 (31.0)	2 (6.9)	3 (10.3)	4 (13.8)

\*PCP=Primary Care Provider

### *Patient Assessment of Chronic Illness Care*

*Patient Activation.* Patient activation results were inconsistent (Table 7). 35.7% of patients reported that they were never asked for ideas when a treatment plan was made, yet, 28.6% of patients reported that they were always asked for treatment plan ideas. 35.7% were always given choices about treatment to think about, 21.4% were given choices “some of the time”, while 17.9% were given choices “none of the time”. About 71.4% of patients were asked about their medications and its side effects “always” or “most of time, while 17.9% reported that they were asked “none of the time.”

*Delivery System Design/Decision Support.* Overall, there were high levels of decision support, and an effective delivery system in place for the study population (Table 7). All three of these items had responses of “most of the time” and “always” (59.2%, 71.5%, 55.5%). However, of the 28 respondents, 9 patients (33.3%) responded that they were given a written list of things to do to help improve their health “none of the time.” 14.3% were never satisfied we care organization, and 22.2% report never being shown how their self-care habits influenced their condition.

*Goal Setting.* Patients reported high levels of goal setting, with on 6 of the 28 respondents (21.4%) reporting never being asked to talk about goals, 5 (18.5%) was never helped to set eating or exercise goals, 6 (21.4%) were never given a copy of the treatment plan, 16 (57.1%) were never encouraged to go to groups or classes to help cope with their condition, and 6 (22.2%) were never asked questions about their health habits (Table 6).

*Problem-Solving/Contextual Counseling.* An equal amount of patients (57.2% in total) were “always” or never sure that their provider considered their values, beliefs, and traditions when recommending treatments (Table 6). Only 5 patients (17.9%) reported never being helped to make a feasible daily treatment plan. A majority (32.1%) was always helped to plan ahead in taking care of themselves during hard times, while 28.6% were never helped to plan ahead. 10 patients (35.7%) were always asked about how their condition affected their lives, but 32.1% were never asked.

*Follow-Up Coordination.* 59.2% of patients reported being contacted after visits “some of the time” to “always”, the remaining 40.7% reported less frequent to no contact after visits. 53.8% of patients were never encouraged to attend programs in the community to assist with their condition. 35.7% were never referred to a dietician, health educator, or counselor. 42.9% were never told how visits with specialists could impact their treatment, however 39.3% were always told about the benefits of visiting a specialist. A majority of patients (46.4%) were never asked how visits with other doctors were going, compared to the 35.7% of patients that were always asked about other visits.

**Table 7. Assessment of Care for Chronic Conditions**

Survey Item n(%)	None of the time (1)	A little of the time (2)	Some of the time (3)	Most of the time (4)	Always (5)
<b>Patient Activation N=28</b>					
1. Asked for ideas when we made a treatment plan.	10 (35.7)	3 (10.7)	3 (10.7)	4 (14.3)	8 (28.6)
2. Given choices about treatment to think about.	5 (17.9)	3 (10.7)	6 (21.4)	4 (14.3)	10 (35.7)
3. Asked to talk about any problems with medicines or their effects.	5 (17.9)	1 (3.6)	2 (7.1)	6 (21.4)	14 (50.0)
<b>Delivery System Design/Decision Support</b>					
4. Given a written list of things to do to improve health. (n=27)	9 (33.3)	0 (0.0)	2 (7.4)	5 (18.5)	11 (40.7)
5. Satisfied that care was well organized. (n=28)	4 (14.3)	1 (3.6)	3 (10.7)	8 (28.6)	12 (42.9)
6. Shown how self-care influenced condition. (n=27)	6 (22.2)	1 (3.7)	5 (18.5)	4 (14.8)	11 (40.7)
<b>Goal setting</b>					
7. Asked to talk about goals in caring for condition. (n=28)	6 (21.4)	2 (7.1)	4 (14.3)	5 (17.9)	11 (39.3)
8. Helped to set specific goals to improve eating or exercise. (n=27)	5 (18.5)	1 (3.7)	2 (7.4)	9 (33.3)	10 (37.0)
9. Given a copy of treatment plan. (n=28)	6 (21.4)	2 (7.1)	5 (17.9)	2 (7.1)	13 (46.4)

**Table 7. Assessment of Care for Chronic Conditions (Continued)**

Survey Item n(%)	None of the time (1)	A little of the time (2)	Some of the time (3)	Most of the time (4)	Always (5)
<b>Goal setting</b>					
10.Encouraged to go to a specific group or class to help cope with chronic condition. (n=28)	16 (57.1)	0 (0.0)	4 (14.3)	1 (3.6)	7 (25.0)
11.Asked questions, either directly or on a survey, about health habits. (n=27)	6 (22.2)	2 (7.4)	3 (10.0)	4 (14.8)	12 (44.4)
<b>Problem-solving/contextual counseling N=28</b>					
12.Regular doctor/primary care provider thought about values, beliefs, and traditions when recommending treatments.	8 (28.6)	2 (7.1)	4 (14.3)	6 (21.4)	8 (28.6)
13.Helped to make a treatment plan that could be carried out in daily.	5 (17.9)	1 (3.6)	3 (10.7)	8 (28.6)	11 (39.3)
14.Helped to plan ahead so patient could take care of condition even in hard times.	8 (28.6)	1 (3.6)	4 (14.3)	6 (21.4)	9 (32.1)
15.Asked how chronic condition affected life.	9 (32.1)	0 (0.0)	4 (14.3)	5 (17.9)	10 (35.7)
<b>Follow-Up Coordination</b>					
16.Contactd after a visit to see how things were going. (n=27)	8 (29.6)	3 (11.1)	4 (14.8)	3 (11.1)	9 (33.3)
17.Encouraged to attend programs in the community that could help. (n=26)	14 (53.8)	1 (3.8)	3 (11.5)	4 (15.4)	4 (15.4)

**Table 7. Assessment of Care for Chronic Conditions (Continued)**

Survey Item n(%)	None of the time (1)	A little of the time (2)	Some of the time (3)	Most of the time (4)	Always (5)
<b>Follow-Up Coordination</b>					
18. Referred to a dietician, health educator, or counselor. (n=28)	10 (35.7)	3 (10.7)	1 (3.6)	3 (10.7)	11 (39.3)
19. Told how visits with other types of doctors, like an eye doctor or other specialist, helped treatment. (n=28)	12 (42.9)	1 (3.6)	0 (0.0)	4 (14.3)	11 (39.3)
20. Asked how visits with other doctors were going. (n=28)	13 (46.4)	1 (3.6)	2 (7.1)	2 (7.1)	10 (35.7)

*Scale Relationship to Demographics and Insurance Status*

A correlation of the data revealed that the modified Nijmegen Continuity

Questionnaire (NCQ) and the PACIC were significantly inversely related,  $r = -.836$ ,  $N = 28$ ,  $p < .05$ , two tails. Lower mean scale scores of the modified NCQ were associated with higher mean scale scores of the PACIC. This is to be expected, as the scale variable values for the two scales were inversely related.

There was no significant correlation between age and the mean scales scores of the modified NCQ ( $r = -.006$ ,  $N = 29$ ,  $p > .05$ , two tails), or the PACIC ( $r = -.114$ ,  $N = 28$ ,  $p > .05$ , two-tails). There was not a significant difference for gender and their scale mean scores of the modified NCQ (Female:  $M = 2.07$ ,  $SD = .997$ ; Male:  $M = 2.21$ ,  $SD = .821$ ;  $t(27) = -.399$ ,  $p = .693$ ), or the PACIC (Female:  $M = 3.27$ ,  $SD = 1.33$ ; Male:  $M = 3.23$ ,  $SD = .940$ ;  $t(26) = .095$ ,  $p = .925$ ). There was significant difference in insurance status and scale mean scores for the modified NCQ (Insured:  $M = 1.95$ ,  $SD = .860$ ; Uninsured:

$M = 3.13$ ,  $SD = .884$ ;  $t(26) = -2.523$ ,  $p = .018$ ), however, there was no significant difference in insurance status and the PACIC (Insured:  $M = 3.34$ ,  $SD = 1.17$ ; Uninsured:  $M = 2.64$ ,  $SD = 1.38$ ;  $t(25) = 1.156$ ,  $p = .259$ ).

There was not a significant effect of age on scale mean scores for the modified NCQ [ $F(2, 23) = 1.214$ ,  $p = .332$ ], or the PACIC [ $F(4,22) = 1.208$ ,  $p = .336$ ]. There was also no significant effect of race on scale mean scores for the modified NCQ [ $F(1,27) = 2.51$ ,  $p = .125$ ], or the PACIC [ $F(1, 26) = 2.12$ ,  $p = .226$ ].

### *Reliability*

The alpha coefficient for the 8 items of the modified Nijmegen Continuity Questionnaire, and the 20 items of the PACIC were .895 ( $M = 2.12$ ,  $SD = .928$ ), and .956 ( $M = 3.26$ ,  $SD = 1.19$ ), respectively, suggesting that the items have relatively high internal consistency, with .70 considered as acceptable.

## **Discussion**

This study evaluated primary care engagement in ED patients in a medically underserved area and factors that influence continuity of care and chronic illness care. The study also assessed the concordance of a self-report survey with the recorded registrar data of primary care status.

Study findings suggest that 83% of patients reported having a primary care provider, seeing either a physician, nurse practitioner, and/or physician assistant within the last year. However, hospital registrar data only recorded 72.4% of patients having a primary care provider in the hospital system. More patients reported having a primary

care provider than the hospital registrar had recorded. Therefore, the registrar data may be a moderately valid resource to assess primary care status in the hospital ED. These results are in line with other studies that found patient self-report reliable when compared to medical records and registry data<sup>23,24,28</sup>. key short-coming of this particular registrar's recordings was the lack of primary care status updates at each patient encounter in the ED. Patients often expressed that they "were never asked if they had a primary care provider" when registering in the ED. At this particular hospital, it was generally assumed that the patient has maintained the same primary care provider since the patient's last visit to the ED, unless the patient informs the registrar of a change in primary care status. This lapse in patient information upkeep could potentially prohibit patients from receiving optimal care, as coordination of care relies heavily on correct information, more importantly provider information. Regulatory processes could be enforced by accreditation entities, such as the Joint Commission, to require hospitals to maintain up-to-date patient records. Hospital registrars would have to ask patients upon every visit if there has been a change in status in order to keep an accurate record of primary care status.

This study showed no significant effects of age, gender, or race on continuity of care, or chronic illness care. However, this study did show that insured patients (83%) and uninsured patients experienced differences in continuity of care. Study participants with insurance reported having more continuity with their primary care provider and increased interaction and cooperation between the providers involved in their care. This could be explained by the perception that individuals with insurance coverage are more likely to take advantage of health care resources, since they are freed from most to all of

the financial burden.<sup>36</sup> Once a part of the health care system, patients have access to, and often pursue more sophisticated treatment, and consult with more providers and provider networks.<sup>36</sup>

There were significantly high levels of hyperlipidemia (43.3%) and hypertension (76.7%) among the study population. Furthermore, this study showed that patients were not being referred to health programs or classes within their community that could provide support with managing and coping with their chronic conditions. The lack of referrals could be explained by the dearth of clinician knowledge of community programs, or the deficiency of programs available within the area. Healthcare systems, insurers or provider networks, as well as other local groups, such as patient advocacy coalitions or health departments, could develop and maintain a list of available programs and provide these to front line providers to enhance likelihood of providers making referrals. The availability and awareness of these resources to communities and health care entities, could help to reconnect increased health access with better health outcomes, and potentially influence the high prevalence rates of chronic illnesses within this community.<sup>37</sup>

As the gatekeeper of patient care, primary care physicians may have difficulty catering to the complex needs of diabetes patients and their complications, resulting in substandard levels of care for people with diabetes.<sup>38,39</sup> A few studies have shown that more specific care for diabetes can achieve better health outcomes than general primary care.<sup>40-42</sup> Community programs could be a valuable platform to provide diabetes specific care, specifically social support. The availability of social support is an influential factor in adherence to behaviors related to diet, exercise, medication adherence, and blood

glucose monitoring.<sup>37</sup> In this study, 88% of participants were interested in health coaching. Patients may benefit from the development of community classes or programs that specialize in diabetes support through health coaching. The development of such support groups, programs, or classes would help to fill the gap of diabetes-specific care that primary care physicians have difficulty providing. Physicians may be more inclined to refer patients to these opportunities if they are available and easily accessible to the patient.

### **Limitations**

Many elements of this study did not reach statistical significance. This could be attributed to the small and primarily homogenous study sample. This study sample was 90% African American, and was collected from only one emergency department in a metropolitan area. Although the sample largely reflects the true population of the area that this emergency department served, the results of this study cannot be generalized to other medically underserved areas, as the population constituency may differ. Also, this study did not assess the relationships with primary care providers of exclusively those who reported having a primary care doctor. Other limitations included unavailable or incomplete medical records during eligibility screening and the large amount of critically ill patients that were otherwise eligible for the study; both of which can be ascribed to the active nature of the emergency department.

Limitations can be addressed with further research that explores primary care engagement across multiple emergency departments that serve medically underserved

areas, and specifically evaluating primary care continuity of care and chronic illness care of exclusively those who have primary care access. With a larger sample size, future studies could utilize more statistical analysis for concordance, for example Cohen's Kappa, in order to gain a more in-depth understanding of hospital registrar recordings. There is also a need to investigate effective interventions in preventing and/or controlling high hyperlipidemia and hypertension prevalence in medically underserved areas.

## **Conclusion**

Diabetes, coupled with one or more other chronic conditions, could result in a “significantly reduced life expectancy, reduced quality of life for the patient, and a significant burden for society due to increased health care cost”<sup>43</sup>. As primary care plays an essential role in diabetes prevention, treatment, and management, it is important that health care organizations are accessible and actively engaged in providing patients with the proper diabetes care, particularly for those patients located in medically underserved areas. Facilitation of community programs by clinicians and healthcare organizations that emphasize health coaching, combined with adequate primary care delivery, may help to improve coordination of care, reduce the high prevalence of people with diabetes and multiple chronic conditions, and improve the quality of life for those who suffer from these conditions.

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## Appendix A. Patient Survey

### SURVEY: HOW WOULD YOU RATE YOUR PRIMARY CARE EXPERIENCE?

1. Age (years): \_\_\_\_\_ 2. Sex : Female Male

3. Are you Hispanic or Latino? Yes No

4. Which one or more of the following would you say is your race? (Check all that apply):

White
Black or African American
Asian
Native Hawaiian or Other Pacific Islander
American Indian or Alaska Native
Don't know / Not sure
Other (specify below)

5. What is the highest grade or year of school you completed? (Please choose one)

Never attended school or only attended kindergarten
Grades 1 through 8 (Elementary)
Grades 9 through 11 (Some high school)
Grade 12 or GED (High school graduate)
College 1 year to 3 years (Some college or technical school)
College 4 years or more (College graduate)

6. Do you have a primary care doctor? Yes No

7. Do you know the name of your primary care doctor?

Yes, Please enter name: _____
<input type="checkbox"/> No, but I know the name of the clinic where I usually get care. Please enter name of clinic: _____
<input type="checkbox"/> No

8. Have you seen one or more of the following for primary care in the past year? (Check all that apply)

Primary Care Physician
Nurse Practitioner
Physician Assistant

9. Have you seen a specialist (like a heart, kidney, or diabetes doctor) in the past year?

Yes No

10. How many times have you seen a primary care provider in the past year?

0 times
1-2 times
3-4 times
5-6 times
More than 6 times

6. Is there a place that you USUALLY go to when you are sick or need advice your health?

Yes
No
Don't Know

If no, why don't you have a usual source of medical care? (check all that apply)

Do not need a doctor/have not had any problems
Do not like/trust/believe in doctors
Do not know where to go
Previous doctor is not available/moved
Too expensive/no insurance/cost
Speak a different language
No care available/Care too far away, not convenient
Put it off/Did not get around to it
Do not know
Other: _____

7. What kind of place is it - a clinic, doctor's office, emergency room, or some other place?

Clinic or health center
Doctor's office or HMO
Hospital emergency room
Hospital outpatient department
Some other place
Do not go to one place most often
Do not know

8. Is that place (your answer to #12) the same place you USUALLY go when you need routine or preventive care, such as a physical examination or check up?

Yes
No
Don't Know

9. What kind of place do you USUALLY go to when you need routine or preventive care, such as a physical examination or check up?

Clinic or health center
Doctor's office or HMO
Hospital emergency room
Hospital outpatient department
Some other place
Do not go to one place most often
Do not know

6. Have you delayed needed care for any of the following reasons in the past year (12 months)? (Check the boxes that apply)

	Yes	No	Do not know
You couldn't get through on the phone			
You couldn't get an appointment soon enough			
Once you get there, you have to wait too long to see the doctor			
The clinic/doctor's office wasn't open when you could get there			
You didn't have transportation			

For each item identified below, circle the number to the right that best fits your judgment of its quality.

The following questions are interested in how connected you have been with a primary care provider within the past year (12 months):

	Scale				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. I know my regular doctor/primary care provider very well	1	2	3	4	5
2. My regular doctor/primary care provider knows my medical history very well	1	2	3	4	5
3. My regular doctor/primary care provider always knows very well what he/she did previously	1	2	3	4	5
4. My regular doctor/primary care provider knows my familial circumstances very well	1	2	3	4	5
5. My regular doctor/primary care provider knows my daily activities very well	1	2	3	4	5
6. My regular doctor/primary care provider contacts me if it is needed, I do not have to ask	1	2	3	4	5
7. My regular doctor/primary care provider knows very well what I believe is important in my care	1	2	3	4	5
8. My regular doctor/primary care provider keeps in contact sufficiently when I see other care providers	1	2	3	4	5

The following questions are interested in the type of help with your condition you get from your regular doctor/primary care provider within the past 6 months:

<b>Over the past 6 months, when I received care for my chronic conditions, I was:</b>	<b>Scale</b>				
	<b>None of the time</b>	<b>A little of the time</b>	<b>Some of the time</b>	<b>Most of the time</b>	<b>Always</b>
9. Asked for ideas when we made a treatment plan.	1	2	3	4	5
10. Given choices about treatment to think about.	1	2	3	4	5
11. Asked to talk about any problems with my medicines or their effects.	1	2	3	4	5
12. Given a written list of things I should do to improve my health.	1	2	3	4	5
13. Satisfied that my care was well	1	2	3	4	5
14. Shown how what I did to take care of myself influences my condition.	1	2	3	4	5
15. Asked to talk about my goals in caring for my condition.	1	2	3	4	5
16. Helped to set specific goals to improve my eating or exercise.	1	2	3	4	5
17. Given a copy of my treatment plan.	1	2	3	4	5
18. Encouraged to go to a specific group or class to help me cope with my	1	2	3	4	5
19. Asked questions, either directly or on a survey, about my health habits.	1	2	3	4	5
20. Sure that my regular doctor/primary care provider thought about my values, beliefs, and traditions when they recommended treatments to me.	1	2	3	4	5
21. Helped to make a treatment plan that I could carry out in my daily life.	1	2	3	4	5
22. Helped to plan ahead so I could take care of my condition even in hard	1	2	3	4	5
23. Asked how my chronic condition affects my life.	1	2	3	4	5
24. Contacted after a visit to see how things were going.	1	2	3	4	5
25. Encouraged to attend programs in the community that could help me.	1	2	3	4	5
26. Referred to a dietician, health educator, or counselor.	1	2	3	4	5
27. Told how my visits with other types of doctors, like an eye doctor or other specialist, helped my treatment.	1	2	3	4	5
28. Asked how my visits with other doctors were going.	1	2	3	4	5

We have just a few more questions about you:

. How confident are you filling out medical forms by yourself?

- Extremely
- Quite a bit
- Somewhat
- A little
- Not at all

. Do you currently use a cell phone?    Yes  No

*If you answered "YES", please continue to question 19a...*

17 a. Is it a smart phone?    Yes  No

. How often do you use a cell phone or smart phone to send or receive text messages?

- One or more times a day
- One or more times a week
- One or more times a month
- Less than once a month
- Never

. How would you rate your interest in each of the following services to help you take charge of your health?

	Very interested	Somewhat interested	Not at all interested
1. Text messages from your doctor's office	1	3	5
2. A health coach to meet with you and help you reach your health goals	1	3	5