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Clinician Driven Disparities in the Care of Black/African American Patients with Diabetes: Low Density Lipoproteins in an Urban Clinic

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This is to certify that I have examined this
Doctor of Nursing Practice systems change project
written by

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and have found that it is complete and satisfactory in all respects,
and that any and all revisions required by
the final examining committee have been made.

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Date

DEPARTMENT OF NURSING

Executive Summary

This quantitative, non-experimental, retrospective chart review investigated the possible presence of clinician driven disparities in the care of Black/African American patients with diabetes at an urban clinic. The study was a response to the Institute of Medicine's call to address patient, system, and clinician issues that negatively impact management of patients with chronic diseases including diabetes. The goal is to improve patient outcomes using system wide care guidelines to increase success at meeting the nationally accepted Diabetes 5 (D5) measures.

During a twelve month period, clinician response to elevated low density lipoproteins (LDLs) was assessed while considering patient preferences, side effects of medications, economic issues, and patient adherence. Patients were divided into groups with either government or private insurance and by race/ethnicity. The sample consisted of 75 individuals, 41 Caucasian, 19 African Americans, and 15 Eastern Africans.

The study used an unvalidated diabetes chart assessment tool developed by the researcher. Information regarding other LDL related comorbidities were tracked including body mass index and hypertension. The study was guided by the social justice theory and Wagner's Chronic Care Model.

Findings of the study did not support clinician driven disparities. However, it was evident there is room for improvement in LDL management of patients in the study regardless of race or socioeconomic status.

The research makes several recommendations for systems changes to improve outcomes of diabetes management of all patients at the clinic.

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Chapter 1

Background and Significance of the Study

The Centers for Disease Control (CDC, 2010) estimated 24 million people in the United States have diabetes. Of these, approximately 18 million people have been diagnosed with diabetes; 6 million have diabetes but are currently undiagnosed. Nearly all undiagnosed individuals have Type 2 diabetes. Type 1 diabetes accounts for 5-10% of the disease and occurs mainly in children and adolescents 18 years and younger. Type 2 diabetes usually occurs in adults, most commonly diagnosed after 60 years of age, and accounts for 90% to 95% of all diagnosed cases.

In 2007, uncontrolled diabetes is recorded on death certificates as the 7th leading cause of death. However, it is estimated the number of patients who die of diabetes is greatly underreported (CDC, 2007). According to the CDC's *Healthy People 2010* progress review (2005), deaths from diabetes are two times higher in the African American population than they are in Caucasians.

All of these numbers are expected to rise as it is estimated the incidence of diabetes in the United States is increasing to near epidemic proportions with approximately 1.6 million new cases diagnosed annually in all ethnic groups. Healthy People 2010, a national initiative, notes that improved data collection and surveillance systems are, to some degree, factors that are contributing to the increased reported numbers in patients with diabetes.

Information available on Caucasians adults indicates that 14.9 million (9.8% of the population) have diagnosed or undiagnosed diabetes. In 2007, sufficient data were

not available to derive prevalence estimates of both diagnosed and undiagnosed

diabetes for all minority populations. However, available information regarding non-

Hispanic Blacks in this age group indicated that 3.7 million or 14.7% had diagnosed

and undiagnosed diabetes (Magwood, Zapka, & Jenkins, 2008). Updated information

in a CDC press release dated June 24, 2008 reported "the rate of diagnosed diabetes

was highest among Native Americans and Alaska Natives (16.5 percent). . . . followed

by blacks [*sic*] (11.8 percent) and Hispanics (10.4 percent), [including Puerto Ricans,

Mexican Americans, and Cubans]. By comparison, the rate for Asian Americans was

7.5 percent with whites [sic] at 6.6 percent "(CDC, 2008, p. 1).

Diabetes can lead to unfortunate and expensive complications including

cardiovascular disease, strokes, blindness, end stage renal disease, neuropathy, erectile

dysfunction, and non-traumatic lower limb amputations. Ethnic minorities, including

African Americans, are disproportionally affected by diabetes and consequently suffer

disproportionately from long term complications of the disease.

Not surprisingly, Barnes et al. (2004) note the cost of health care is four times

greater for patients with diabetes than for individuals without diabetes with $174

billion spent for both direct ($116 billion) and indirect ($58 billion) health care costs.

Direct costs include illness requiring medical care, procedures, medications, insulin, x-

rays, and surgery. Examples of indirect costs include unnecessary illness, expense,

work loss, premature mortality, and disability.

It has long been recognized that ethnic/racial minorities in the United States

receive suboptimal health care. In 1998, Congress commissioned the Institute of

Medicine (IOM) to examine issues of disparity and implications for patient care,

research, and education. In 1999, the IOM published its *Unequal Treatment Report*

which verified the presence of disparities in health care citing patient factors, system factors, and clinician factors as contributing to the inequity (IOM, 2003). In the report *Crossing the Quality Chasm: 2001*, the IOM noted sizable gaps in health care quality with diabetes as one of 20 priority areas for improvement. The report called for "substantial improvements in six major aims–that health care be safe, effective, patient-centered, timely, efficient, and equitable" (p. 11). Healthy People 2010 builds on health care information from the past twenty years and contains 467 objectives for improved health care (including care of patients with diabetes) for the years 2000-2010. Healthy People 2010 delineates two overarching goals—to increase quality and years of healthy life and to eliminate health care disparities (HHS, 2005).

The United States is making dramatic improvements in overall health and life expectancy of its citizens including those with diabetes. For example, the adjusted rate of diabetes related deaths in all patients has dropped from 7.6 per 1000 in 2003 to 3.0% per 100,000 in 2009 (CDC, 2009). Despite this improvement, national data continue to indicate that minority Americans have poorer health outcomes from preventable and treatable diseases (including diabetes) when compared to Caucasians. According to Bach et al., when treatment disparities are eliminated, disparities in health outcomes are substantially attenuated or absent (2002).

On a local level, the Minnesota Department of Human Services and Minnesota Community Measures (MNCM) have adopted the nine nationally accepted health care measures of care, one of which includes optimal diabetes care. For the last two years, MNCM has compiled a report comparing the performance of clinics and medical groups within the state on these measures. The patients are divided into two groups: residents of Minnesota whose health care is covered under government insurance, the

Minnesota Health Care Programs (MHCP), and those who have private, purchased (other) health care insurance. A disproportionately higher number of individuals from ethnic/racial minorities in Minnesota are from a population with a lower socioeconomic status (SES) and are insured through government plans (Minnesota Community Measurement, 2009, Executive Summary). Statistics regarding type of insurance are important because the prevalence of obesity (a risk factor for diabetes) and diabetes are inversely related to socioeconomic status (Betancourt & Maina, 2004); type of insurance is often used as a measure of SES. In addition, these authors found disparities exist even in insured minorities. This is in agreement with the IOM report (2003) indicating racial and ethnic minorities receive lower quality of health care even when medical insurance and income levels are the same.

The *2008 Health Care Disparities Report for Minnesota Health Care Program* determined that, using the IOM's quality measures, *".* . . performance in achieving high quality care was significantly lower at both the statewide and medical group levels for MHCP compared with Other Purchasers. . . .(although) gaps in performance between MHCP and Other Purchasers have narrowed for all measures. . . . (including) optimal diabetes care" (mnhealthscores.org, 2009, p. 5). The D5 is a nationally accepted measure of adequate diabetes care and includes reaching the following five measures: 1) hemoglobin A1C below 7%; 2) blood pressure below 130/80; 3) low density lipoprotein below 100; 4) use of one aspirin daily and 5) nonsmoking status. Statewide, 7.8% of diabetic patients with MHCP have reached a D5; 13.4% of patients with private (Other) insurance have reached a D5 (Minnesota Community Measurements, 2009).

Quality measures at the large health care system where this study took place have improved in several MNCM quality measures and have shown some, but not optimal, improvement in the area of diabetes care. According to MNCM, this care system ranks sixth out of the eight major health care systems in the Twin Cities area in percentage of patients who have achieved a D5 score (Minnesota Health Scores, 2008). The system's goal in 2009 for D5 scores (with A1C of below7.0%) was 20%. The percentage of D5s across the system was 14% in 2008 and 19% as of March, 2009. The average D5 among the 18 primary care clinics was 22.8%. The urban clinic where the study took place has a high percentage of individuals with government insurance and consistently has the lowest percent of patients with a D5 reaching only 13% at the end of March 2009 (health care system statistics, 2009).

The researcher met with a leading endocrinologist at the health care system to discuss parameters of the study. The number of patients with elevated hemoglobin A1C levels and elevated low density lipoprotein, both of which are outcome measures of the D5, varied from month to month at the clinic where the study took place. Treatment of elevated blood glucose involves considerably more options than those to treat elevated lipoproteins; for these reasons this study tracked clinician response to LDL values when investigating the possibility of clinician driven disparities.

The clinic is located in an area where there is a large Eastern African population. The endocrinologist suggested the researcher also separate patients from Eastern Africa from those patients who indicated race/ethnicity as Black/African American to look for any differences within the Eastern African population related to diabetes care.

The researcher is a certified nurse practitioner and clinical practice director (CPD) at this large urban clinic. As a CPD, one of the researcher's responsibilities is to work toward improved patient care and outcomes, including those of patients with diabetes. Optimal diabetes care measures at the clinic have consistently been the lowest when compared to all other primary care clinics within this health care system and suggest ethnic/racial disparities in care. For example, 34.5% of Caucasian and 12% of Black/African Americans had LDLs under control throughout this study (see Appendix A, sample size, inclusion and exclusion criteria). During meetings related to improving diabetes care outcome measures, clinicians at the clinic most often cite patient issues as an explanation of suboptimal outcome indicators. This explanation coincides with the findings by Sequist, Ayanian, Marshall, Fitzmaurice, and Safran (2008) who noted that clinicians were more likely to perceive patient factors than clinician or systems factors as contributing to less than optimal patient care outcomes.

Improved diabetes care outcomes should lead to improved health of patients of the system and would decrease the number, and therefore, cost of care of individuals who experience long term complications of diabetes. The cost of patient care may decrease as, according to Stewart et al. (2000), common ground in clinician-patient interactions is associated with ". . . better (patient) recovery . . . . and (appropriately) fewer diagnostic tests and referrals" (p. 796).

In addition to improved patient outcomes, this health care system could benefit from financial incentives offered by third party payers. These payers are providing substantial bonuses to health care systems who meet the benchmark goals of the D5 in the care of diabetes patients. According to the director of health support for this health care system (personal communication, July 25, 2009), one internal medicine site

within the system is currently participating in a pilot program with five payers, the majority of which provide $50 per patient per month to manage care of patients with diabetes who do not meet the D5 benchmarks. Two of these payers have provided the health care system with a grant to support this pilot project. According to information presented at the July 7, 2009 clinical practice directors and clinician managers meeting, "(This health care system) is at risk for more than $1 million in pay for performance withhold from our payers" In this statement, the presenter was referring to reimbursements from third party payers to health care systems that reach benchmark goals of patient care thereby.decreasing cost of care to enrollees in the managed care plan

Research Question

Are there clinician driven disparities in the care of Black/African American patients with diabetes?

Hypothesis:

There are clinician driven disparities in the care of Black/African American patients with diabetes when compared to care of Caucasians.

There is a need for system change if the low density level of Black/African American patients is out of control more often than those of Caucasians and/or if there are differences in the number of actions clinicians take to address elevated LDL levels in patients of different race/ethnicity.

Challenges of the Study

This study found no clinician driven disparities. Examining this issue was important since most clinicians agree health care disparities occur at the national or

state level and even within the community where the clinician practices but do not feel

disparities occur with patients under his/her care (Sequist et al. 2008).

Clinicians often report there is not enough time for optimal diabetes care and

that they are being asked to provide more care with the same or fewer resources

(Bodenheimer, Wagner, & Grumbach, 2002). When clinicians are under increased

stress and time pressures there is a subconscious tendency to categorize or stereotype

beliefs and expectations based on ethnicity in an effort to simplify and shortcut

decision making (Betancourt & Maina, 2004).

This study depends on race/ethnicity as supplied by the patient when

registering at the clinic for an initial appointment. The clinic manager estimates 95%

of patients register over the phone and are asked about their ethnicity using a standard

race/ethnicity selection form. The remainder of patients register at the front desk; on

some occasions and for various reasons, staff find it necessary to make reasonable

guesses regarding patient ethnic/racial background. Information regarding preferred

patient language and need for interpreter are also gathered. While this is an imperfect

process, the efforts of this health care system are more forward-thinking than the many

institutions which have not yet begun to collect any information regarding

race/ethnicity making it impossible to understand and track progress toward improved

care and outcomes of minority populations (Betancourt & Maina, 2004).

Project Objectives

The purpose of the study was to determine if clinician driven disparities exist

in the care of Black/African American patients with diabetes at this large urban clinic.

 Data collection was performed to determine if both Caucasian and Black/African

American patients with diabetes received equal and appropriate care in management of

LDL levels. The study tracked appropriate use of lifestyle coaching and the use of statins as outlined in the organization's standards of care. Patient preferences, economic challenges, and patient response to clinician recommendations were monitored since any of these issues may affect the clinician's ability to move forward in interventions to improve care outcomes. Analysis attempted to determine if levels of care differ related to race/ethnicity and/or type of insurance.

Social Justice Theory

The ultimate goal of this project is to improve the care of all patients with diabetes through equitable care, improved management of diabetes, avoidance of complications of diabetes, and premature deaths. It is expected improved care of ethnically/racially diverse patients will also have a positive impact on care of all patients with diabetes, including Caucasians. An understanding of clinician issues related to inequities in care is necessary before action can be taken to address the problem at clinic, system, community, and national levels. Actions toward inequities in care are appropriately addressed through the lens of social justice.

Social justice has six dimensions: health, personal security, reasoning, respect of others, attachment, and self-determination (Mathis, 2007). It is the principle of moral rightness and equity as applied to individuals living together in communities and sees each individual as an equal part of who we are as a society. In her presentation in 2008, Sister Amata Miller explained social justice attends to the needs of the individual, looks for answers to inequities and calls for a social response (action) to address a problem. It demands fair and impartial treatment of others and conformity to moral rightness in attitude and action.

Social justice refers to institutions in society that aspire to fairness between two individuals (or between an individual and a group) and holds the government responsible for equitable distribution of the goods of society. Social justice requires skills of "inspiring, working with, and organizing others to accomplish together a work of justice . . . . it aims at the good of the city, not at the good of one agent only "(Novak, 2000, p. 2). Equality in health care means provision of care that does not differ in quality because of ethnicity or socioeconomic status and is included as a goal of and commitment to equity in health care outcomes in the 21st century (*Crossing the Quality Chasm*, 2001).

In *Unequal Treatment* (2003), health care is determined to be a resource, a social good, tied to social justice and quality of life for individuals and groups. In his work, *Distrust, Social Justice, and Health Care* (1999), McGary notes most individuals in the United States view health care as a "primary good" that every rational person is presumed to want. The author refers to the writings of Dr. Rawlings, a leading political philosopher, on the subject of social justice. "Rawlings argues that the allocation of these goods is subject to the contraints of justice . . . . (and contends) . . . . that the least-advantaged members of society, as measured by their possession of the primary goods, should be the gauge by which we judge the justness of the basic structure of society" (p. 236). McGary sees justice as a first virtue of social institutions which are responsible for establishment of rules of society. Where injustice is seen, the state has a mandate to take action to eliminate or mitigate the inequality. The author refers to the resulting general distrust by Blacks/African Americans of all public institutions (and particularly the health care system) based, in

part, on the gross injustices and breaches of trust by the medical community toward

minorities and especially African Americans.

In her compelling book, *Medical Apartheid*, Washington (2006) writes of the

long history of injustices, particularly medical experimentation, perpetrated upon

minority individuals extending back to at least the eighteenth century as "more than a

historical fact. Although less rife, it remains a contemporary reality, and an ever-

present possibility" (p.386). Washington acknowledges that medical research

involving minorities today is much safer and, in fact, necessary to address health care

issues, particularly those that affect Blacks/African Americans in greater numbers or

level of severity. Washington encourages African Americans to welcome and

participate in medical research while remaining wary of research abuses. She cautions

that "Both the federal government and private corporations have devised large-scale

research abuses that range from radiation experiments to biological-weapons

development. This medical ill-usage has not strictly paralleled scientific knowledge:

Rather, it has mirrored the larger American cultural beliefs as well as politics and

economic trends "(p. 385).

McGary (1999) notes the perception of unfair treatment by the health care

system does not mean the inequity actually is occurring. However, McGary proports

the health care system has a responsibility to acknowledge the history of this distrust

and correct erroneous perceptions. This is good counsel for the government given this

nation's long history of laws and policies that condoned discrimination until the Civil

Rights Acts of 1964 and 1968. Policymakers have long known of disparities in health

care and have established eliminating health care disparities as a priority. It is

important for researchers in health care to explain the value of ethical research and

changes in health care that focus on the ethnically or racially diverse. These special

efforts, without being excessive, may reestablish confidence in these basic institutions

of society.

Nursing codes of ethics "identify standards of practice, detail provision of

particular services, and address fiduciary relationships that are essential hallmarks of

any profession (Salladay, 2008). These codes hold the nurse accountable as an

individual who has a special relationship of trust, confidence, or responsibility to

others. As a guide for action based on social values and needs, the *Code of Ethics for*

Nurses with Interpretive Statements (2008) assigns nurses the fundamental

responsibility for promotion and restoration of health in care of patients and

communities without regard of race or economic status. Crigger (2008) notes nurses

are committed to justice in health care and are called to be responsive to differences in

health resources and resource distribution. Nurses need to raise the moral sensibility

of unfairness and are encouraged to engage in social justice at local, national, and

international levels. The author states: "Nursing is potentially a very powerful

international discipline, a from below agency, that can impact on social, economic and

political climate of the world" (p. 21).

Nurse practitioners (NPs), in particular, have a mandate and are uniquely

positioned to address issues of social justice while working to improve the health of

others. In their article, *Examining the Potential of Nurse Practitioners from a Critical*

Social Justice Perspective, Browne and Tarlier (2008) note ". . . we have come to

recognize the 'value added' component of NP practice – namely, the social justice

aspects of the role in the context of illness treatment, health promotion and prevention

services "(p. 89). Nurse practitioners must advocate for changes that are at the root of practices that perpetuate inequities.

This system change project is based on principles of social justice and is the first step in determining the need for action aimed toward the reduction of health care disparities of patients within the clinic and throughout the health care system.

Chapter 2

Theoretical Framework

Wagner's Chronic Care Model is the theory supporting this system change project. Dr. Wagner proposes a reorganization and redesign of a different type of care system more tailored to the needs of patients with chronic illnesses. Wagner includes six interrelated components of care that guide improved management of patients with chronic disease. These six components are self-management support, clinical information systems, delivery systems redesign, decision support, health care organization, and community resources. Decision support includes the use of evidence based practice clinical guidelines into patient care of individuals with chronic diseases (Bodenheimer, Wagner, & Grumbach, 2002a). Wagner's model strives for improved health care outcomes as the result of productive interactions between an informed, activated patient and a prepared, proactive practice team.

The health care system where this study took place regularly disseminates information regarding updated practice guidelines for the care of patients with diabetes. A diabetes registry is updated and distributed monthly to all clinicians involved in primary care of patients with diabetes. The registry includes information regarding current measures of each patient's progress toward a D5. During the time of this study, each clinician/nurse team worked together to manage the registries although with varied success. In his Chronic Care Model, Wagner recommends that one individual at each clinic be assigned the responsibility of working the registries.

Literature Review

Background

As stated earlier, when the IOM published its *Unequal Treatment Report* (verifying disparities in health care of minorities), patient factors, system factors, and clinician factors were identified as contributing to the disparities (2003).

Patient issues.

Healthy People 2010 (2005) cites many patient issues that may contribute to health care disparities in patients with diabetes. These include but are not limited to "Westernization" of diet (increased fats and processed foods), demographic changes, decreased physical activity, genetics, socioeconomic status, level of patient knowledge, and cultural and community traditions. Another proposed patient factor is the belief that African Americans have a stronger sense of the present and a fatalistic view of their diabetes believing the disease and associated complications are inevitable and unpreventable (Barnes et al. 2004). Dagago, Funnell, and Davidson (2006) found that, as a group, African American individuals are usually aware of the increased incidence of diabetes in the African American population but have a lower level of understanding of the complications of diabetes.

Adverse social determinants also contribute to patient factors. These include a lower level of education, inadequate or unsafe housing, racism, and living in close proximity to environmental hazards (Betancourt & Maina, 2004). Dovidio et al. (2008) noted unequal distribution of medical services and the associated poor access to health care as two system factors that disproportionately and negatively affect the health care of Black/African American patients. Although there is a belief that ethnic/racial minorities show poor adherence to treatment regimens, Egede and

Dagago (2005) note there is no evidence for ethnic nonadherence to treatment plans with the exception of self blood glucose monitoring (SBGM). However, almost all patients with diabetes monitor their blood glucose less frequently than recommended with 18% of African Americans and 30% of Caucasian patients testing at minimal recommendations. These authors recommend clinicians not assume lack of adherence to a treatment plan until the patient reports that this is actually the case.

Another patient issue, some aspects of which are intertwined with systems issues, is lack of health care insurance in the minority population. Betancourt and Maina (2004) reported a disproportionate number of minorities are uninsured: 20% of African Americans are uninsured as compared to only 11% of Caucasian patients. In addition, diabetes care and outcomes can be affected by insurance issues when clinicians make incorrect assumptions regarding the person's insurance status and likelihood of adherence to a treatment plan. Kirk et al (2005) note clinicians may make incorrect assumptions regarding minority patients' insurance coverage which can adversely affect other care decisions including additional testing and referrals. Lurie et al. (2005) came to that same conclusion when researching disparities in referrals among cardiologist noting that ". . . referral decisions were often based on incorrect assumptions about patient insurance status. In other words, the physician often assumed that the patient was uninsured when this was, in fact, not the case" (p. 1269).

Systems issues.

System issues refer to the manner in which health care is structured at a systems level and may affect patient ability or willingness to seek or continue with health care. Historic and contemporary inequalities have led to a persistent wariness between the medical

community and Black African/ American patients which can affect the climate of health care interactions and health care outcomes. Betancourt and Maina (2004) reported 65% of African American patients are afraid of being treated unfairly at future health care visits while only 22% of Caucasians individuals have that same concern. This distrust between the Black/ African American population and clinician-researchers continues to contribute to the underrepresentation of minorities in contemporary health care research. According to Clark (2009), ". . . although African Americans make up only 13% of the United States population, they account for almost half of the estimated number of HIV/AIDS diagnoses made during 2006" (p.123). However, non-Hispanic Blacks and Hispanic patients were less likely to participate in trials than Caucasians and, therefore, less likely to receive experimental medications. These authors note the work of J. Merz who wrote that underrepresentation in clinical trials "leads to results that do not account for a host of factors. . . that could have a huge impact on how well new drugs do in the real world" (p. 1).

 As noted by the IOM in *Shaping the Future for Health* (2001), other system problems include language barriers, fragmented health care systems (where minorities are enrolled in government programs, often with greater limitations on health care expenditures), and incentives to clinicians to limit services. Even when minorities and Caucasians have the same type of insurance, the location of and/or lack of access to care for these potentially expensive patients can be a barrier.

Clinician issues.

The third factor noted by the IOM as contributing to health care disparities is clinician issues. According to Larme and Pugh (1998), medicine is driven by symptoms. These authors address the appeal of treating acute illnesses while chronic care (with few or no immediate symptoms) requires efforts toward preventing complications that may not occur for many

years. It is easier and more gratifying to treat and provide relief to those who are experiencing symptoms at the time of the visit. The authors contend the emphasis of medical education and continued medication education is more often focused on acute problems and illnesses and is less effective in imparting information related toward improved chronic disease management. In addition, the authors note the treatment of diabetes is labor intensive and time consuming. Clinicians are aware that SBGM causes pain to patients instead of immediate alleviation of symptoms. Clinicians are slow to adopt standards of care and have a negative opinion of the flow sheets used to track care measures. The authors note that "Primary care providers have the most negative attitudes about diabetes, yet they provide 80% of all office visits for diabetes mellitus "(p. 1391).

Bodenheimer, Wagner, and Grumbach (2002a) refer to the "tyranny of the urgent". "Frequently, the acute symptoms and concerns of the patient crowd out the less urgent need to bring chronic illness under optimal management. . . . patients are not adequately taught to care for their own illnesses. . . . Too often, caring for chronic illness features an uninformed passive patient interacting with an unprepared practice team, resulting in frustrating, inadequate encounters" (pp. 1-2). These authors recommend creation of practice teams that integrate evidence-based clinicial practice guidelines into care of patients with chronic illnesses.

Clinician inertia, the recognition of a problem but failure to act, has been attributed to an overestimation of care provided, the use of "soft" reasons to delay increased use of medications, and/or a lack of focus on therapeutic goals (Phillips et al., 2001). For example, a clinician fails to advance therapy in a nonadherent, morbidly obese patient who has had time and expressed intent to improve glycemic

control and eating habits but whose diabetes remains uncontrolled and who has not

gone forward with changes in eating habits.

In addition, clinicians feel there is not enough time for diabetes care. Bodenheimer,

Wagner, and Grumbach (2002b) noted clinicians often had only ten minutes of face-to-face

time with the patient, five of which was spent on diabetes management. Under these

circumstances, although 65% of the patients had an average HgbA1C of 8.9%, therapy was

intensified only 15% of the time. Interestingly, there was no difference in quality of care

between high and low volume clinicians.

In 2002b, these same authors describe the "hamster syndrome" in health care, i.e. the

push to work harder with the same or, in some cases, fewer resources. This syndrome leads to

use of the conditioning phenomenon which involves assigning individuals to a group based on

race, gender, or age and then applying group characteristics to individuals. This conditioning

phenomenon is used by all human beings, subconsciously and automatically, to simplify

decision making and lessen cognitive effort. Individuals are more likely to resort to this type

of behavior when stressed as is often the case during a rushed health care visit. Some

clinicians, however, have an overly positive view of the quality of care provided even under

the above noted circumstances (Bodenheimer, Wagner, & Grumbach, 2002b). In addition,

many patient behaviors are related to less apparent socioeconomic factors (e.g. poverty) and

not race, ethnicity, or cultural traditions (Betancourt & Maina, 2004).

The "Not Me" Phenomenon is the belief that racial disparities occur in health care but

not in the individual clinician's practice. ". . . Whereas the majority of primary-care clinicians

support the collection of patient race and ethnicity data, only a minority report the presence of

racial disparities in diabetes care among patients they personally treat" (Sequist et al. 2008, p.

683). These authors report that 88% of primary care providers nationally agree that disparities

occur but only 40% believe differences in care of minority patients would be noted in the

clinician's own patients/clinic. A meta-analysis of 35 studies compiled by Kirk et al. (2005)

cited data indicating "The major ethnic differences (in patients with diabetes) reported were

lower rates of eye examination, influenza vaccination, and lipoprotein testing among

Hispanics and African Americans than among non-Hispanic whites" (p. 349).

Definition of Terms

Health care disparities.

Braveman (2006) defines health disparities as "a difference in which

disadvantaged social groups---such as the poor, racial/ethnic minorities, women, or

other groups who have persistently experienced social disadvantage or discrimination-

---systematically experience worse health or greater health risks than more advantaged

social groups" (p. 167).

Low density lipoproteins.

Cholesterol is a fat-like substance containing both lipids and proteins.

Cholesterol travels in the blood and is present in cell membranes. The three major

classifications of lipoproteins measured in fasting serum are high density lipoproteins

(HDL), low density lipoproteins (LDL), and very low density lipoproteins (VLDL).

Sixty to seventy percent of cholesterol is made up of LDL which are the major

atherogenic lipoproteins and the primary target of cholesterol-lowering therapies.

Statins (or HMG-CoA reductase inhibitors) are a class of drug used to lower

cholesterol levels by inhibiting the enzyme HMG-CoA reductase, which plays a

central role in the production of cholesterol in the liver. Although LDL continues to

receive primary attention, growing evidence indicates that VLDL and HDL also play

an important role in atherogenesis. Elevated HDL levels are inversely related to risk

of coronary heart disease. Low HDL levels often reflect the presence of atherogenic factors. VLDLs are precursors of LDL; some forms of VLDL appear to promote atherogenesis, similar to LDLs.

According to the National Institutes of Health's ATP Panel III Final Report (2001), "Persons with type 2 diabetes have a 10-year risk for major coronary events (myocardial infarction and CHD [coronary heart disease] that approximates the risk in CHD patients without diabetes. . . . Thus type 2 diabetes constitutes a CHD risk equivalent" (p. II-53, National Institutes of Health, 2001.) In patients with diabetes, aggressive cholesterol-lowering therapy still leaves absolute CHD rates far above those in low-risk populations (p. II-4.) For this reason, treatment of LDLs in patients with type 2 diabetes should follow recommendations for persons with established CHD. According to the Institute for Clinical Systems Improvement (ICSI, 2008), "The goal (for patients with diabetes) with CAD [coronary artery disease] is less than 70 mg/dL. . . . even [in those patients] with a baseline LDL of less than 100 mg/dL" (p. 26). The NIH advises:

> Persons with LDL cholesterol ≥ 130 mg/dL generally require a statin drug to achieve LDL cholesterol < 100. Therefore, a statin should be initiated simultanteously with TLC [therapeutic lifestyle changes] and maximal control of other risk factors. . . .[those] with LDL cholesterol ≥ 130 mg/dL generally will require an LDL-lowering drug to achieve LDL cholesterol < 100 mg/dL. (2001, p. IV-2).

This report maintains a goal of LDL under 100 in individuals with diabetes but acknowledges there are differing recommendations regarding treatment of LDL in individuals whose level is between 100-129 mg/dL. Some authorities recommend

initiation of statins if TLC do not bring the LDL level to < 100; others recommend use

of drugs that modify other lipoprotein factors (High [HDL] and very low density

lipoproteins [VDLD], and triglycerides) e.g. nicotinic acid and fibrates. Still other

sources allow the clinician to use clinical judgement in the decision to withhold drug

treatment in these individuals (NIH, 2001.) The care system where this study took

place, as well as MNCM holds to an LDL of < 100 in individuals with diabetes; an

LDL at this level remains the desired outcome measure in determination of the D5.

Individuals under 18 or over 75 and those treated for active cancer are not included in

the health care system's diabetes registry.

The health care system where this study took place includes lipid testing as part

of diabetes standing orders (see Table 1).

Table 1

Diabetes Standing Orders

Lipid Testing		
If	Lab Test	Frequency
LDL ≥ 100	Chol Fx/AST	Within 6-12 weeks
No Lipid Med	Chol Fx	Within 12 months
Stable Lipid Med	Chol Fx/AST	Within 12 months

Chapter 3

Methodology

Study design.

This study was a quantitative, non-experimental, retrospective chart review. The study used lab values and office visits of patients seen within an 18 month time frame between January 1, 2008 and June 30, 2009. Within this 18 month window, the goal was to have at least twelve consecutive months of data on each patient, beginning with the most recent primary care appointment between January 1, 2009 and June 30, 2009 and working back in time through the medical records.

Study sample.

The target population was patients ages 18-75 inclusive with permanent Last Word addresses in Minnesota or Wisconsin, who have been seen in primary care for an outpatient clinic visit at least three times in the last 12 months, carried an ICD-9-CM diabetes mellitus (250.xx) code on their problem list, and whose primary care clinician and diabetes clinician practice within the internal medicine department at the clinic.

Inclusion/Exclusion criteria.

In order to be included in the study, the patient had to have been seen at least three times within an 18 month window beginning January 1, 2008 and ending June 30, 2009. This initial query yielded a list of 417 patients, 235 Caucasians and 182 Black/African Americans. The focus of this study was to investigate clinician response to individuals with LDLs out of control. For this reason, 103 patients had LDL values that were under control during the entire time frame of the study and so

were excluded. Of this sample, 34.5% were Caucasian and 12.1% were Black/African American. (Appendix A).

There was inadequate lab data on 57 Caucasians (24.3%) and 57 Black/African Americans (31.3%). A total of 12 patients were eliminated due to an inadequate number of office visits.

This study investigated possible differences in care between African Americans and individuals who came to the United States from Eastern Africa. In order to make as accurate a determination as possible, a review of the medical record was completed on all individuals who identified themselves as Black/African American. Individuals whose demographic information indicated the need for an interpreter of a language spoken in Eastern African (e.g. Somali) or whose country of origin was dictated in the medical record as being from an Eastern African country were accepted as Eastern African and included in the study (see Appendix B for Eastern African countries and languages). There were 31 individuals who indicated their race/ethnicity as being Black/African American but whose medical record gave no information as to whether the patient was of African American or Eastern African descent and so were excluded. Fifteen patients whose medical record indicated country of origin as one on the continent of Africa but not from Eastern Africa (as defined by the CDC) or who were from other parts of the world were excluded.

This study used type of insurance as an indicator of socioeconomic status. Thirty six patients were self-pay or had both government and private insurance and were excluded from the study (see Appendix C for list of government and private insurances). Because this study included individuals ages 18-75, it is likely some patients excluded from the study because they had both government and private

insurance were individuals 65 and over who had Medicare and a privately purchased supplemental insurance. Individuals who were missing lab data or had not been seen three times during the time frame of the study (114) were excluded.

From the original query of 417 patients, 194 (82.6%) Caucasians and 148 (81.3%) Black/African Americans were excluded. The final sample of 75 patients included 41 Caucasians and 34 Black/African Americans. The researcher was able to determine that 15 of the 34 Black/African American sample were of Eastern African descent.

Research tool.

The diabetes chart audit tool (Appendix D) was used to monitor actions taken by clinicians during and between office visits related to LDL testing to determine the presence or absence of health care disparities. Chart review included a manual search for demographic and insurance information, review of office visit dictations, lab order forms, lab letters, telephone calls, pharmacy records, and health care records from other health care facilities imported into the patient medical record.

The tool monitored sequencing and recommendations of lifestyle coaching, starting, changing, increasing, or discontinuation of a statin, and clinician recommendation to schedule a follow up appointment and/or lab draw. Information regarding the number of patients who expressed concern regarding the cost of medication and clinician response to this information was entered on the tool. Because untoward side effects of statins could influence clinician actions this information was also tracked.

The tool indicated the percentage of clinicians taking action for those patients whose LDLs were out of control during the time periods of the study. Information from the tool was used to define four groups of patients:

1) Those whose LDL was under control and taking a statin.

2) Those whose LDL was under control and not taking a statin.

3) Those whose LDL was not under control and taking a statin.

4) Those whose LDL was not under control and not taking a statin.

Each of these groups were then divided by race/ethnicity. Tests for differences in percentage of patients with appropriate actions taken by clinicians and differences in proportions based on race were reported.

Body mass index.

Obesity is a risk factor for many chronic diseases including diabetes and hypercholesterolemia. The body mass index (BMI) is used to define normal weight, overweight, and obesity. Although the level of risk associated with BMI varies slightly depending on race/ethnicity, a person is considered overweight if the BMI is above 24.9 and obese if the BMI is 30 or above.

Lifestyle changes.

Lifestyle changes (modifications of habits or patterns) are often recommended as a first line therapy for patients whose LDL is out of control. Patients may request a trial of diet and exercise changes before starting on a statin. These changes are a mainstay of LDL management and, depending on the degree of LDL elevation, may prevent the need for statins.

Complementary and alternative medicines.

The tool monitored patient preference for use of complementary and

alternative medicines (CAM) before being started on a statin. Patient decision to try a CAM is tracked since this is a patient decision and does not reflect clinician failure to respond to an elevated LDL value.

CAM is a term currently accepted by the National Institutes of Health to describe alternative treatments used in place of or in tandem with pharmaceuticals prescribed by Western medicine to promote health or treat illness. Many patients see a combination of CAM and conventional medicine as the optimal approach to their health care particularly when neither approach is viewed in a hierarchal manner.

In their 2007 qualitative study of 37 regular users of IM, McCaffrey, Pugh, and O'Connor noted more than one-third of Americans preferred to use CAM or integrative medicine approaches for their health care needs. The participants in their study emphasized the centrality of the patient-clinician relationship ". . .[in which physicians are viewed] as guides rather than commanders "(p. 1500). In 2004, a report released by the National Center for Complementary and Alternative Medicine (NCCAM) and the National Center for Health Statistics (NCHS) showed that 36% of American adults were using some form of CAM (Vogel et al., 2005, p. 186). In his presentation on 11/18/2009, Sash listed plant stanol/sterols, omega-3 (found in oily fish), flax seed, soluble or viscous fiber, antioxidants, and flavonoids as CAMs that have been shown to reduce LDL levels.

Patient preference.

Information regarding patient preference was gathered in the chart review tool. Patient preference has a direct impact on options available to a clinician in management of LDLs.

Goff, Mazor, Meterko, Dodd, and Sabin (2007) state an estimated 20-50% of patients do not take medications as prescribed noting participant beliefs and preferences about medication prescribing as contributing factors. These beliefs and preferences ". . . encompassed 3 major areas: patient-doctor relationships, outside influences, and professional expertise. . . . [and included] participants' concerns about the pharmaceutical industry's influence on doctors' prescribing practices and belief that there is a clear 'best' medication for most health problems "(p. 236).

In their work exploring the phenomenon of saying "no" to recommendations of healthcare providers, Michaels, McEwen, and McArthur (2008) compared patient and professional cultures and their differing approaches to starting medications. These authors note that, for some individuals, health care is needed only when symptoms directly impact the everyday experience. A patient symptom based approach to diabetes and LDL management is one of the clinical challenges in treatment of chronic disease. Chronic disease management requires convincing the patient to control their illness become developing symptoms of the long term or fatal complications of poorly controlled diabetes or LDLs.

The IOM (2001) calls for patient care based on best scientific knowledge while allowing for patient control. The Institute notes that in order to meet both of these IOM recommendations, evidence-based practice requires and relies upon evidence-based individual decision making which can only be learned by listening to the client's health stories, values, and beliefs.

Entwistle, Carter, Crubb, and McCaffery acknowledge the value of patient autonomy but caution that ". . .many health care practices can affect autonomy by virtue of their effects not only on patients' treatment preferences and choices, but also

on their self-identities, self-evaluations and capabilities for autonomy" (2010, p. 741).

The authors agree patients should be offered options, allowed and enabled to make

voluntary choices but note discussions related to autonomy rarely address

implementation of choices and required lifestyle changes. "Patients may feel

abandoned rather than autonomous if their clinicians refuse to do more than inform

them about options and insist they choose. . . . clinician interactions should support

the autonomy of patients. . . by helping (patients) form, maintain or re-establish self-

identifies that they are comfortable with, and to deal with emotions and social stigma

(of disease)" (p. 742).

Ethical Considerations

It is necessary to verify clinician driven disparities before moving forward to

address clinician driven disparities in provision of health care to those from lower

socio-economic backgrounds and/or of Black/African American ethnicity. If clinician

driven disparities are evident, the information must be disseminated in a sensitive and

non-threatening manner. In order to maintain anonymity, information on clinicians

will be presented as a group. The prinicipal investigator and the individual who

completed data entry completed a required on-line educational course regarding ethics

in research. Any information identifying the patient were kept locked in a drawer

unless being used by the researcher or research assistant. A list with the patient's

medical record and research number were also kept in a restricted access on line

computer folder.

Support From Site

The researcher was invited to a meeting of the health care system's council of

investigators to discuss and receive input regarding this study. The administration of

the health care system allowed the principal investigator full access to the medical

records of any patients seen at the clinic with a diagnosis of 250.xx and to insurance

information, outcome data, and initiatives related to improved diabetes care within the

health care system. Two clinicians within the health care system agreed to serve as

site mentor and were readily available to the principal investigator.

Chapter 4

Data Analysis

This study examined whether the percentage of clinicians following the protocol for controlling LDL levels differed among all included ethnic groups and between those with public or private insurance. Assuming 50% of clinicians treating Caucasians follow the LDL treatment protocols, and 40% of clinicians treating the Black/African American population follow the protocol with 100 patients in each racial group, for a one-sided test with a level of significance alpha=0.05, there was 36% power to detect a 10% (e.g. 50-40%) difference, 63% power to detect a 15% (e.g. 55-40%) difference, and 86% power to detect a 20% (e.g.60-40%) difference. Stata version 10 was the statistical software used to analyze the data.

Description of the sample.

Demographic characteristics.

Over 50% of the sample of 75 patients were Caucasian, 25% were African American, and 20% were East African (Appendix E). Just over a third (37%) of the sample was women with a large majority (63%) of African Americans being female. There were more African American females in the study (63.2%) than Caucasians or Eastern Africans.

Caucasians were the most likely to be married (42%) and to have private insurance (73.2%). Across all racial groups, patients were typically in their mid-50s.

Private or public health insurance

Insurance type of those individuals in the study closely matched insurance coverage of the patient population of all individuals who are patients at the clinic. Clinic-wide, 41% of patients have government insurance; 59% have private insurance

or are self pay (personal communication, finance director, September, 2010). The

percentage of patients in the study with government insurance was 38.7% (see

Appendix F for demographic characteristics by payer) As noted on Appendix E, a

significantly larger percentage (73.2%) of Caucasian patients had private insurance

than did African Americans (47.4%) and East Africans (46.7%).

BMI/obesity.

The average BMI in 2008 and 2009 was 33.7 and was nearly the same between

Caucasions and African Americans (Appendix G). The BMI of Eastern Africans

(27.3) was significantly lower than African Americans (35) in both 2008 and 2009.

As a group, Eastern Africans had the lowest BMIs but some of the highest LDLs.

As noted on Appendix H, females were more likely to be morbidly obese than

males. Patients whose BMI was below 25 had the highest LDL (148) compared to

those whose BMIs were over 25 or 30+. This statistic may reflect lower BMIs of

Eastern African patients although the sample size of Eastern Africans is quite small.

Lifestyle changes.

At any point in time, 50% of patients whose LDLs were out of control wanted

to try lifestyle changes. More Caucasians and African Americans than Eastern

Africans wanted to try this approach to LDL management. The small number (1) of

Eastern Africans who preferred to try lifestyle changes (16.7%) brought down the

sample size of all patients who wanted to try lifestyle changes (see Appendix I, actions

taken during the year given baseline status on LDLs and medications).

The primary focus of information presented on Appendix I is on those

individuals whose LDLs were out of control. It is important to understand these

groups can go in and out of control at any time during this study, i.e. the information in this study was not presented in a linear fashion.

Clinician driven disparities.

As noted earlier, the sample size before exclusions included 417 patients, 235 (56.4%) Caucasians and 182 (43.6%) Black/African Americans individuals who had a least three office visits within the 18 month time frame. Of patients excluded because LDL was under control, 34.5% were Caucasian and 12.1% were Black/African American (see Appendix A). Therefore, more Caucasians were included in the initial sample (417) since they came in more frequently for health care and more were excluded because their LDLs were more often under control.

The study sample (N=75) was not representative of the original query or the clinic population. The study sample included more Black/African American patients than in the clinic population or the query (N=417). The study sample of Caucasions was representative of the clinic population.

This information suggests that at the start of the study the sample was a fairly homogenous group and was perhaps not representative of the entire patient population at the clinic, particularly Black/African Americans. The findings may have changed if the sample included Blacks/African Americans who did not come in to be seen and did not have lab work drawn in a timely manner.

There was not a significant difference between Caucasians and Black/African Americans related to initiation of statins when LDL was out of control (Appendix I). The same number of individuals of all races had LDLs that were out of control and on a statin as those whose LDL was out of control and not on a statin. This table shows appropriate management of patients who were on a statin and whose LDL was out of

control. Medications were increased 46.4% of the time and changed 21.4% of the

time. Of note, medications were more frequently increased in African Americans who

were on medications but whose LDLs were out of control. If health care disparities

were occurring at the clinic, one would expect medications would be increased less

frequently in this group when compared to Caucasions.) Conversely, half of all three

groups who had LDLs above goal were not started on medications, regardless of race.

LDL findings.

Patients with suboptimally controlled LDLs at the beginning of the study's

time frame were more likely to be female (43%), privately insured (68%), and married

(43%). There were more Caucasians who had LDL under control at the beginning of

the study; these individuals had slightly poorer control at the end of the study. This

finding is of interest since individuals with higher socioeconomic status often benefit

from environment factors that would help control LDLs. This may be related to the

urban location of the clinic and, again, could not be generalized to other clinics.

Patients whose LDL was out of control at the beginning of the study (Appendix J)

were more likely to be female, privately insured, and married. Patients whose LDL

was under control at the end of the study's time period were more likely to be older

(60 vs. 54 years of age) and female (Appendix K); female patients were more

successful at getting their LDLs under control given they were more likely to be out of

control one year prior.

Inclusion in this study required at least two LDLs and a minimum of three

office visits between 1/1/2008 and 6/30/2009. LDL values may have been obtained

anywhere during this time frame; many individuals had more than two LDLs values

and fourteen patients had more than the average 5 office visits (Appendix L). Both of

these factors may be skewing the findings. 14 patients in the study came in for more than 5 office visits; one patient came in ten times. These factors may also be skewing data related to LDL measurement.

Medication management related to LDL values was tracked during the study. The patients were divided into two groups, those who were and were not on medication when LDL was measured at baseline (see Appendix L) during the study. Of the 60.7% of patients whose LDL was out of control at first measurement, 78.6% were still out of control by the third office visit and 39.3% were still out of control by the fourth office visit. At the beginning of the study, the largest group of patients had LDLs that were out of control and were not on medications (37.3%). This may be related to the degree by which the LDL was out of control. Table 2 illustrates LDL values all of which are considered out of control with the exception of the first reading for patient 1.

Table 2

Examples of elevated LDL values over time

Patient 1	70	115	127	121	126	115
Patient 2	144	134	148			

Only 40% of patients in the study whose LDL was suboptimally controlled at baseline and who were not on a statin at the beginning of the study were started on a statin. However, of those patients who were on a medication but whose LDL was out of control at baseline, almost 50% had an increase in dose and 21% had a change in medication.

According to current D5 measurements, LDLs should be under 100. As illustrated above, some patients had LDL values that were close to but above 100. Clinicians often choose not to start or increase medications in patients when values are close to goal. However, it is recommended patients with diabetes who also have certain comorbidities including hypertension and/or coronary atherosclerosis should maintain an LDL at or below 70.

The majority of patients came in to the clinic three to five times during the time frame of the study and had two or more LDL values drawn during the approximately 12 months when the person's care was tracked. At each of these data points, the patient was determined to have LDLs that are in or out of control and if the individual was taking a statin. LDL value and use of medications could change over the time of data collection. Therefore, an individual whose LDL was under control at time one may or may not have been under control by the end of the study.

It is notable that at point one in data collection, 56/75 or 75% of individuals had LDL values above goal. Of these 56 individuals, 50% of individuals were not on a medication and 50% were on medication. At the end of the study, 28% of patients had a LDL at goal, 70% were on statins; 49% of the patients who were not at goal were not on a statin.

Race/ethnicity.

There is discussion regarding the definition of race and ethnicity and use of these terms when discussing health care disparities. It is often social rather than genetic factors that underlie the racial gap in society and in health care. Hebert (2008) lists the differing definitions used by various organizations including the Agency for Healthcare Research and Quality (AHRQ), the IOM, and the World Health Organization (WHO). This author adopts Hebert's definition of race as a "social construct based on phenotype . . . . [the observable, physical expression of genetic and environmentally determined characteristics] . . . . and as a marker for exposure to social factors that can influence health including socioeconomic position, lifestyle habits, and use of health care (p. 375)." He defines ethnicity as another social construct that is based on a shared culture, ancestry, language, religion, and traditions. Given the overlap in these definitions, Hebert recommends the use of the blended term, race/ethnicity.

This study depended on race/ethnicity information supplied by the patient (usually over the telephone) when registering at the clinic for an initial appointment. This health care system currently provides reception staff with a brief script to assist in gathering race/ethnicity information or answering patient questions regarding the need for this information. The fact that this health care system requests and records race/ethnicity is a more forward-thinking approach than some institutions which have not yet begun to collect information regarding race/ethnicity. Without collection of data regarding race/ethnicity, it might be assumed that there are no health care disparities. Information regarding race/ethnicity is necessary to develop statistical

models that seek to measure disparities in care (Hasnain-Wynia, Pierce, Haque, Hedges Greising, Prince, & Sabin, 2007).

CAM/patient preference.

Only one person tried CAMs at any point throughout the entire study (Appendix I). Ten of the 28 individuals with LDLs out of control at baseline and not on any medications had expressed a preference to try something other than statins; 5 were Caucasian, 4 were African American, and 1 was Eastern African (Appendix M).

Economic issues.

Three patients whose LDLs were in control changed medications due to financial concerns or had changes in insurance that required a change in medication (Appendix J). In all three cases, clinicians responded in an appropriate manner, e.g. referral to the clinic social worker, utilization of a low cost drug plan, or use of a medications on the patients pharmaceutical formulary. It may be that most clinicians chose initial medications that are more economical for the patient so very few patients have concerns regarding the high cost of medications. Cost was determined to be more of an issue for African American patients 37.5% of the time than for Caucasians or Eastern Africans.

Side effects.

Side effects of statins may include myalgias, muscle weakness persisting for more than two days, nausea, abdominal pain, yellowing of skin and eyes. Laboratory values used to assess medication side effects of statins include a creatinine kinase and alanine transaminase. In this study, only six (8%) patients had side effects of the statin prescribed (Appendix N).

Adherence issues.

Medication adherence issues were identified in 8 (10.7%) of all patients included in the study; this issue was most evident among Eastern Africans (60%). However, the sample number of Eastern Africans was quite small and included only nine individuals.

Chapter 5

Discussion of Findings

This study did not demonstrate the presence of clinician driven disparities but instead showed the need for improved care in the management of LDLs of all patients with diabetes regardless of race.

Inclusion/exclusion criteria indicated more Black/African Americans were included due to poor control of LDLs, yet more of these individuals were excluded because of inadequate lab data. Although the inclusion/exclusion criteria resulted in approximately the same percentage as Black/African Americans and Caucasians, the resulting study sample of 75 was a fairly homogenous group of patients who came in for lab testing and office visits on a regular basis. Additional information regarding health care disparities might be obtained by taking a closer look at the individuals who were excluded as part of the study design. In order to increase the sample size, especially the numbers of African Americans and Eastern Africans, it may be necessary to broaden the scope of the study to include other clinics within or outside this health care system.

The researcher recommends several system changes related to the methodology of the study. The study tool should be streamlined and validated. This study tool extracted data at several different points in time during the time frame of the study. While some conclusions can be drawn from actions at each of these points in time, it would be most informative to use a tool that tracks the progression of clinician actions by analyzing the sequence of actions taken at each visit.

A large portion of time was spent during the chart review as the researcher searched the electronic medical record for information to allow the separation of African American and Eastern African patients. The researcher recommends the use of a demographic tool with granular data reflecting the race/ethnicity of individuals who are currently residence of the community. The tool should also contain an open "other" category for individuals whose race/ethnicity is not reflected in the drop down menu. This "other" information could be used to adjust the demographic tool as demographics of the community change Collection of this information has become more important with the increasing diversity of patients seen with in the health care system, each group with its unique psychosocial perspective and approach to lifestyle changes, particularly diet and exercise.

It may be helpful to have experts in the management of LDL levels of patients with diabetes review the most current best practice recommendations in care of these patients. The health care system where the study took place uses the Plan-Do-Check-Act approach based on Deming's Wheel (1986) which is helpful to identify and assist in management of gaps in the use of protocols and recommendations regarding models of care.

It is important to have BMI measures that are accurate and obtained in a consistent manner. In addition, as recommended in the writings of Dr. Edward Wagner, the assignment of diabetes registry management to one individual instead of individual clinician/nurse teams may facilitate increased numbers of patients seen at the clinic.

Patient preference had a minimal effect on management of LDLs in this study. Most patients were willing to use medications for management of LDL and did not

object to increases in dose. Very few patients experienced side effects of statins or voiced a preference regarding treatment including the wish for a trial of lifestyle changes or use of complimentary alternative medicine. Only a small number of patients expressed concern regarding the cost of medications. However, large numbers of patients had LDLs that were uncontrolled and should have been started on statins; others were taking a statin but the dose needed to be adjusted to bring LDL values to recommended levels.

This project was an extremely valuable learning experience. The project confirmed the writer's interest in research in the clinical setting and the opportunity to expand knowledge personally and to share and discuss the study findings with other individuals and health care systems. The writer has a clearer understanding of the research process including the importance of IRB approval and the ethical demands of research. This study required the assistance and support of many individuals within and outside of the health care system including a research assistant, statistician, and physician informatics specialist.

Conclusions/Recommendations Related to the Need for System Changes

This study showed a need for several system changes to improve care of all patients with diabetes who have elevated LDLs. A work team should be employed to identify and manage gaps in clinician use of protocols. The use of experts in evidence based practice regarding diabetes management and a change in focus of clinician education and continuing education toward improved management of chronic diseases would be helpful.

The study results did not show clinician driven disparities. However, results showed the need for system changes designed with a vision of equity in health care

that is aligned with the goal of improved patient outcomes for individuals of all races and ethnicities who have diabetes. In addition, results may determine if the study tool is an appropriate tool for measurement of clinician actions in other areas of health care research.

A system change is needed to improve adherence regarding minimal follow up visits and lab work. A recommendation is to assign one care coordinator within the clinic the responsibility of using the diabetes registry to contact patients who have not been seen in a timely manner or who need lab work. This fits well with the model of the health care home, a system change currenting used in several of this health care system's primary care sites that has been shown to improve patient care, outcomes, and clinician satisfaction in care of patients with chronic illnesses. Health care home assigns patients to one of four tiers and reimburses the health care system depending on complexity of care. Level of complexity is determined using the number and type of diagnosed illnesses for each patient, the need for translation services for the patient and/or caregiver, and the presence of mental health issues. Health care home reimbursement varies from tier 1 (least complex) of approximately $10 to tier 4 (most complex) of approximately $60 per patient per month.

Accurate demographics and a complete patient problem list are key to receiving the highest possible reimbursement from third party payers (personal communications with director of health support and contractor for implementation of Epic in the clinical setting, October, 2010). Even with the upcoming transition to Epic, clinicians will be required to enter patient diagnoses on the problem list. The importance of population of the problem list will be stressed to clinicians during the roll out of Epic. It is predicted Epic will allow improved data extraction from the

electronic medical records; this change should improved efficiency and accuracy for health care research with a combined goal of optimal patient outcomes and responsible stewardship of health care dollars.

The data collection tool gathered information from the patient problem list regarding comorbidities and complications related to diabetes and LDL management. Hypertension is one of these comorbidities and complicates treatment of patients with diabetes. Accurate information on the patient problem list is important since the recommended LDL goal of individuals with comorbidities is less than 70 mg/dL rather than a goal of 99 mg/dL or below in individuals with diabetes who do not have one of these comorbidites or complications.

In this study, more specific information regarding Black/African American categories would have facilitated efficiency and accuracy in the determination of either African American or Eastern African race/ethnicity. A system change working toward use of an improved race/ethnicity demographic tool with a drop down feature under each race of more granular data information of all patients is necessary. Legal action at the national level mandating consistency in collection of more complete information among government agencies would have an impact would have an effect on data collection at the local level. It may be helpful to conduct a public health campaign, similar to that of the Census Bureau, informing patients of the change in collection of race/ethnicity information as an effort to provide improved health care to all who live in the community.

A systems change could focus on obtaining consistently accurate BMI information. Many patients are measured with significantly different types of footwear and outer garments which vary from day to day and from season to season.

Although this study did not show health care disparities, this health care system may want to further explore issues related to discordance between health care providers and patients. According to Chen, Fryer, Phillips, Wilson, and Joseph (2005), only 22% of African Americans perferred an African American clinician; 65% had no preference. Caucasians preferred a Caucasian clinician 13% of the time; 75% had no preference. Of those patients who had a preference, those whose preferences were met more often rated their care as excellent. It is acknowledged patients may be guessing regarding the race/ethnicity of their clinician similar to guesses that may occur when the patient registers at this clinic. At this time, the role of the patients' beliefs and preferences as contributing factors related to health care disparities are unclear. Although discordant patient-clinician race may not affect quality of care, having a concordant race provider might incentivize patients to follow up on care recommendations. According to the authors, these findings are consistent with previous research and, based on the findings, "the solutions for racial and ethnic disparities in health will need to go beyond increasing the number of minority physicians and attempting to teach cultural competence; rather, addressing discrimination in the health care system, increasing access to minority physicians, and improving the ways for patients to choose physicians may be more potent options for reducing racial disparities" (p. 142).

Limitations of the Study

The findings of this study are not generalizable to other clinics within this health care system or to other health care systems. The diabetes assessment tool was developed by the researcher and has not been validated.

Sample size was quite small which limited the ability to capture significant differences between Black/African Americans and Caucasians as well as affecting the reliability and

generalizability of the findings. BMI measurements and patient problem lists are accepted with the understanding there are concerns regarding accuracy and completeness.

The reseacher, a nurse practitioner familiar with LDL management in care of patients with diabetes and who has an understanding of the medical record, was solely responsible for the chart review and data collection. Given a larger budget, additional clinicians could participate in the chart review allowing for comparison of findings.

Dissemenation

This information will be presented to the researcher's advisor and professors at St. Catherine University and key stakeholders at the health care system where the study took place. Decisions regarding poster presentation and national meetings and publication will be made after completion of the study.

Implications for nursing

This study supports the role of the doctorally prepared nurse as being aware of concerns in the practice setting and using leadership skills to incorporate evidence based practice guidelines and research to make system changes that improve patient care and outcomes in the clinic, community, and nation. Working along with a Ph.D. prepared statistician illustrated the benefits of combining efforts with a D.N.P. in research and a better understanding of specific patient care needs.

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Appendix A

Sample Size, Inclusion and Exclusion Criteria

	Cauca-sian	African American	East African	Blacks: AA+EA	Total
Inclusion Criteria, n (% of initial sample)					
Had 3 office visits from Jan 08-June09	235			182	417
	56.4%			43.6%	
Exclusion Criteria, n (% of initial sample)					
LDLs under control throughout the study	81			22	103
	34.5%			12.1%	24.7%
Inadequate information on LDLs	57			57	114
	24.3%			31.3%	27.3%
Lab visits were in 2009, but after June 30th	27			20	47
Only had 1 LDL during study's timeframe	9			14	23
No LDL lab visits during study's timeframe	20			22	42
Never had an LDL	1			1	2
Insurance Issues	28			8	36
Unclear information re AA or EA	NA			31	31
DM care through endocrinology	17			5	21
AA/BL but not AA or EA				15	15
<3 office visits within during study's timeframe	9			3	12
Total Excluded, n (% of initial sample)	194	72	30	148	342
	82.6%			81.3%	
Final Sample, n (% of final sample)	41	19	15	34	75
	54.7%			45.3%	

Appendix B

Registration Options: Eastern African Countries and Languages

Country	*Language Options*
Burundi	French, Swahili
Djibouti	Arabic, Somali, French
Eritrea	Tigrinya, Arabic
Ethiopia	Amharic, Somali
Kenya	Swahili, Arabic, Somali
Malawi	Primary non-English language not offered
Mozambique	Swahili
Rwanda	French
Somalia	Somalia, Swahili, Arabic
Tanzania	Swahili
Uganda	Swahili

Note. Does not included languages/dialects spoken but not included as option on clinic/system list. From http://www.cdc.gov/2008.

Appendix C

Insurances Accepted at Clinic

Government	Private
Medicaid	Aetna
BCBS PMAP/MN Care	Americas PPO/TPA
HP PMAP/MN Care	BCBS
Medica PMAP/MNCare	BCBS Mgd Care
Medicaid/MNCare/Champus	HP Insured
Ucare PMAP/MNCare	HP Open Access Insured
Medicare	HPOpen Access Self Insured
BCBS MedicareBlue PPO	HP Out of Network
BCBS MCHO/SNP Secure Blue	HP self Insured
BCBS Vantage Blue Cost	Industrial
HP 65+ CAP	Medica Choice
HP Freedom 65+ Cost	Medica Elect
HP MSHO	Medica SelectCare
Medica MSHO	No CF Grouping
Medica Seniors Cost	Non Contracted
Medicare FFS	Other Commerical
Medicare Private FFS	Patient Choice
Ucare Seniors	PrePay
	Preferred One CHP
	Preferred One PPO
	Preferred One Specified
	Self Pay
	Special Processing

Appendix D

DIABETES CHART AUDIT TOOL

Zip Code: _____

Res# ☐☐☐   **PROVIDER INITIALS**   **No. MD visits/time frame:**   **Contacts w/HSN:**

_____   _____

No. known failed appts: **Contacts w/IDC:**

Age _____   **Gender**   ○ M   **Race/Eth**   ○ Cauc   **Payer** ○ Gvmt   ○ Private
                   ○ F   ○ AfAm
                                        ○ EastAf

Marital Status   D M P S U W X   Interpreter /Language: _____

Process Care Measures	Comorbidities/Complications	/	/	- Ht:	Wt:	BMI:
/ / - / /	401. 402. 403. 404. 405. 414.	/	/	-	Wt:	BMI:

STARTING WITH EARLIEST CHOL DURING ABOVE TIME FRAME

Date of 1st OV related to Process Care Measures :____/____/_____
Date of Applicable Cholf:_____ (Circle one: LDL <100;   LDL ≥ 100)
        ○ Y ○ N Side effects, _____
                ○ Y ○ N Lifestyle coaching only
                ○ Y ○ N CAM
                ○ Y ○ N Start statining agent
                ○ Y ○ N Currently on statining agent
                        ○ Y ○ N Statining agent discontinued by clinician
                        ○ Y ○ N Increase statining agent
                        ○ Y ○ N Change statining agent
                        ○ Y ○ N Patient preference considered
                        ○ Y ○ N Cost/insurance identified as an issue
                                ○ Y ○ N Appropriate action taken
        ○ Y ○ N Advised repeat cholf or F/U visit in : ≤ 3 mos. ≤ 1 yr.
        ○ Y ○ N Measurement related to start/increase of medication
        ○ Y ○ N Therapeutic delay in Rx mgmt. (e.g.: Etoh)
        ○ Y ○ N   Adherence issue related to cholf mgmt identified

Date of Visit:_____   Date of Related LDL:_____
        ○ Y ○ N LDL at goal? (most recent cholf-PREVIOUS/SAME DAY/p OV)
                ○ Y ○ N Side effects, _____
                        ○ Y ○ N Lifestyle coaching only (no medications)
                        ○ Y ○ N CAM
                        ○ Y ○ N Start lipid lowering agent
                        ○ Y ○ N Currently on lipid lowering agent
                                ○ Y ○ N Increase lipid lowering agent
                                ○ Y ○ N Change lipid lowering agent
                                ○ Y ○ N Patient preference considered
                                ○ Y ○ N Cost/insurance identified as an issue
                                        ○ Y ○ N Appropriate action taken
        ○ Y ○ N Advised repeat cholf or F/U visit : ≤ 3 mos. ≤ 1 yr.
        ○ Y ○ N Therapeutic delay in Rx mgmt. (eg: Etoh)
        ○ Y ○ N   Adherence issue related to cholf mgmt identified

Appendix D, Continued

Date of Visit:_____   **Date of Related LDL:**_____
  ○ Y ○ N **LDL at goal? (most recent cholf- PREVIOUS/SAME DAY/p OV)**   ○ **NA** _____
    ○ Y ○ N **Side effects, _____**
      ○ Y ○ N **Lifestyle coaching only (no medications)**
      ○ Y ○ N **CAM**
      ○ Y ○ N **Start lipid lowering agent**
      ○ Y ○ N **Currently on lipid lowering agent**
        ○ Y ○ N   **Lipid lowering agent discontinued by clinician**
        ○ Y ○ N   **Increase lipid lowering agent**
        ○ Y ○ N   **Change lipid lowering agent**
        ○ Y ○ N   **Patient preference considered**
        ○ Y ○ N   **Cost/insurance identified as an issue**
          ○ Y ○ N   **Appropriate action taken**
  ○ Y ○ N **Advise repeat cholf or F/U visit in : ≤ 3 mos. ≤ 1 yr.**
  ○ Y ○ N **Therapeutic delay in Rx mgmt. (e.g.: Etoh)**
  ○ Y ○ N   **Adherence issue related to cholf mgmt identified**

Date of Visit:_____   **Date of Related LDL:**_____
  ○ Y ○ N **LDL at goal? (most recent cholf PREVIOUS/SAME DAY/p OV)**   ○ **NA** _____
    ○ Y ○ N   **Elevated LFTs, CPK, myalgia, _____**
      ○ Y ○ N **Lifestyle coaching only (no medications)**
      ○ Y ○ N **CAM**
      ○ Y ○ N **Start lipid lowering agent**
      ○ Y ○ N **Currently on lipid lowering agent**
        ○ Y ○ N   **Lipid lowering agent discontinued by clinician**
        ○ Y ○ N   **Increase lipid lowering agent**
        ○ Y ○ N   **Change lipid lowering agent**
        ○ Y ○ N   **Patient preference considered**
        ○ Y ○ N   **Cost/insurance identified as an issue**
          ○ Y ○ N   **Appropriate action taken**
  ○ Y ○ N **Advised repeat cholf or F/U visit: ≤ 3 mos. ≤ 1 yr.   ○ NA   ○?**
  ○ Y ○ N **Therapeutic delay in Rx mgmt. (e.g.: Etoh)**
  ○ Y ○ N   **Adherence issue related to cholf mgmt identified**

Date of Visit:_____   **Date of Related LDL:**_____
  ○ Y ○ N **LDL at goal? (most recent cholf PREVIOUS/SAME DAY/p OV)** ○ **NA** _____
    ○ Y ○ N **Side effects, _____**
      ○ Y ○ N **Lifestyle coaching only (no medications)**
      ○ Y ○ N **CAM**
      ○ Y ○ N **Start lipid lowering agent**
      ○ Y ○ N **Currently on lipid lowering agent**
        ○ Y ○ N   **Lipid lowering agent discontinued by clinician**
        ○ Y ○ N   **Increase lipid lowering agent**
        ○ Y ○ N   **Change lipid lowering agent**
        ○ Y ○ N   **Patient preference considered**
        ○ Y ○ N   **Cost/insurance identified as an issue**
          ○ Y ○ N   **Appropriate action taken**
    ○ Y ○ N **Advised repeat cholf or F/U visit in : ≤ 3 mos. ≤ 1 yr.**
    ○ Y ○ N **Therapeutic delay in Rx mgmt. (e.g.: Etoh)**
    ○ Y ○ N   **Adherence issue related to cholf mgmt identified**

Appendix D, Continued

	Initial/Date:	Date:	Date:	Date:	Date:
Total chol					
Trigs					
Ratio					
HDL					
LDL					
A1C					

⭘ Y ⭘ N   **Deceased**

ADDITIONAL INFORMATION/NOTES:

Appendix E

Demographic Characteristics by Race

	Race			Total Sample
	Caucasian	African American	East African	
Sample Size (%)	41 (54.7%)	19 (25.3%)	15 (20%)	75
Average Age (SD)	56.7 (10.5)	55.1 (11.3)	53.7 (8.8)	55.7 (10.3)
Female (%)	15 (36.6%)	12 (63.2%) *	1 (6.7%)	28 (37.3%)
Privately Insured (%)	30 (73.2%) *	9 (47.4%)	7 (46.7%)	46 (61.3%)
Married (%)	17 (41.5%)	6 (31.6%)	5 (33.3%)	28 (37.3%)
Interpreter (%) (n=7)			7/15 (46.7%)	7 (9.3%)
• Language (%) (n=7)	•	•	• Oromo 2/7 Somali 5/7	• 7(9.3%)

Notes: SD = Standard Deviation
* Significant at the 0.05 level

Appendix F

Demographic Characteristics by Payer

	Payer	
	Government	Private
Sample Size (%)	29 (38.7%)	46 (61.3%)
Mean Age (SD)	57 (12.4)	55 (8.9)
Female	12 (41.4%)	16 (34.8%)
Married	5 (17.2%)	23 (50%)
Interpreter	4 (13.8%)	3(6.5%)
Language		Oromo 2/3
	Somali 4/4	Somali 1/3

Notes: SD = Standard Deviation

* Significant at the 0.05 level

Appendix G

BMI and Obesity Measures by Race

	Race			Total Sample
	Caucasian	African American	East African	
Sample Size (%)	41	19	15	75
Calendar Year 2008				
BMI - 2008				
Sample Size	40	16	9	65
Average BMI	34.6	35.2	27.3 *	
Standard Deviation	5.77	5.51	3.72	
Range	21.6, 48.0	27.0, 45.9	23.0, 33.0	
Obesity - 2008				
BMI<25	1	0	3	4
Percent	2.5%	0.0%	33.3%	6.2%
BMI>=25	7	3	4	14
Percent	17.5%	18.8%	44.4%	21.5%
BMI>=30	32	13	2	47
Percent	80.0%	81.3%	22.2% *	72.3%
Calendar Year 2009				
BMI - 2009				
Sample Size	40	15	9	64
Average BMI	34.2	35.7	27.9 *	
Standard Deviation	6.0	5.94	3.22	
Range	22.4, 48.0	26.3, 47.3	23.9, 32.9	
Obesity - 2009				
BMI<25	3	0	3	6
Percent	7.5%	0.0%	33.3%	9.4%
BMI>=25	6	3	4	13
Percent	15.0%	20.0%	44.4%	20.3%
BMI>=30	31	12	2	45
Percent	77.5%	80.0%	22.2% *	70.3%

Notes: BMI = Body Mass Index

* Differences between East Africans and Caucasians, and East Africans and African Americans were significant at the 0.05 level

Appendix H					
Demographic Characteristics by Obesity Measures, 2008					
	BMI			Missing	Total
	<25	25+	30+	Data	Sample
Sample Size	4	14	47	10	75
Race					
Age	53.3	55.4	56.6	53.1	
Standard Deviation	7.4	9.3	10.7	11.8	
Female	1	3	22	2	28
Percent	25.0%	21.4%	46.8% *	20.0%	37.3%
Private Insurance	2	9	32	3	46
Percent	50.0%	64.3%	68.1%	30.0%	61.3%
Married	2	5	17	4	28
Percent	50.0%	35.7%	36.2%	40.0%	37.3%
Interpreter	1	3	1	2	7
Percent	25.0%	21.4%	2.1% *	20.0%	9.3%
Language					
Oromo 2/7	1	1		0	7
Somali 5/7		2	1	2	
Last LDL Values	148.0 **	115.6	113.8	118.0	116.5
Median	137	116	111	113	114
Standard Deviation	42.0	23.8	29.4	25.5	29.1
% Last LDL at Goal	0	3	16	2	21
Percent	0.0%	21.4%	34.0%	20.0%	28.0%

Notes: BMI = Body Mass Index

* Differences between BMI groups 30+ and 25+, and BMI groups 30+ and <25 were significant at the 0.05 level

** Differences between BMI groups <25 and 25+, and BMI groups <25 and 30+ were significant at the 0.05 level

Appendix I				
Actions Taken During the Year Given Baseline Status on LDLs and Medications				
Baseline	LDL<100		LDL>=100		Total
Sample Size	19		56		75
	On Meds	No Meds	On Meds	No Meds	
Group	1	2	3	4	Total
Sample Size	15	4	28	28	75
Lifestyle	0	2 (50%)	0	14 (50%)	16 (21.3%)
Nutritional/CAM	0	0	0	1 (3.6%)	1 (1.3%)
Start Medications	5 (33.3%)	0	2 (7.1%)	11 (39.3%)	18 (24%)
Discontinued Meds	2 (13.3%)	0	1 (3.6%)	0	3 (4.0%)
Increased Dose of Meds	3 (20%)	0	13 (46.4%)	4 (14.3%)	20 (26.7%)
Changed Meds	3 (20%)	0	6 (21.4%)	1 (3.6%)	10 (13.3%)
Caucasian	On Meds	No Meds	On Meds	No Meds	
Sample Size	10	3	14	14	41
Lifestyle	0	1 (33.3%)	0	8 (57.1%)	9 (22%)
Start Medications	2 (20%)	0	0	4 (28.6%)	6 (14.6%)
Discontinued Meds	1 (10%)	0	1 (7.1%)	0	2 (4.9%)
Increased Meds	3 (30%)	0	6 (42.9%)	2 (14.3%)	11 (26.8%)
Changed Meds	1 (10%)	0	2 (14.3%)	0	3 (7.3%)
African American	On Meds	No Meds	On Meds	No Meds	
Sample Size	2	1	8	8	19
Lifestyle	0	1 (100%)	0	5 (62.5%)	6 (31.6%)
Nutritional/CAM	0	0	0	1 (12.5%)	1 (5.3)
Start Medications	0	0	0	3 (37.5%)	3 (15.8%)
Discontinued Meds	1 (50%)	0	0	0	1 (5.3%)
Increased Meds	0	0	5 (62.5%)	1 (12.5%)	6 (31.6%)
Changed Meds	1 (50%)	0	4 (50%)	0	5 (26.3%)
East African					
Sample Size	3	0	6	6	15
Lifestyle	0		0	1 (16.7%)	1 (6.7%)
Start Medications	3 (100%)		2 (33.3%)	4 (66.7%)	9 (60%)
Discontinued Meds	0		0	0	0
Increased Meds	0		2 (33.3%)	1 (16.7%)	3 (20%)
Changed Meds	1 (33.3%)		0	1 (16.7%)	2 (13.3%)
All Blacks					
Sample Size	5	1	14	14	34
Lifestyle	0	1 (100%)	0	6 (42.9%)	7 (20.6%)
Start Medications	3 (60%)	0	2 (14.3%)	7 (50%)	12 (35.3%)
Discontinued Meds	1 (20%)	0	0	0	1 (2.9%)
Increased Meds	0	0	7 (50%)	2 (14.3%)	9 (26.5%)
Changed Meds	2 (40%)	0	4 (28.6%)	1 (7.1%)	7 (20.6%)

Appendix J		
Demo Characteristics by LDL Under Control at Time One		
	LDL Not in Control	LDL in Control
	LDL>=100	LDL<100
Sample Size (%)	56	19
Race (%)		
Caucasian	28 (50%)	13 (68.4%) *
African American	16 (28.6%)	3 (15.8%)
East African	12 (21.4%)	3 (15.8%)
Average Age (SD)	54.8 (10.2)	58.4 (10.7)
Female (%)	24 (42.9%) *	4 (21.1%) *
Privately Insured (%)	38 (67.9%)	8 (42.1%) *
Married (%)	24 (42.9%)	4 (21.1%) *
Interpreter (%) (n=7)	6 (10.7%)	1 (5.3%)
Language (%) (n=7)	Oromo 1/6	Oromo 1/1
	Somali 5/6	

Notes: SD = Standard Deviation

* Differences significant at 0.05 level

Appendix K		
Demo Characteristics by LDL Under Control Within a Year		
	LDL Not in Control	LDL in Control
	LDL>=100	LDL<100
Sample Size (%)	54	21
Race (%)		
Caucasian	29 (53.7%)	12 (57.1%)
African American	12 (22.2%)	7 (33.3%)
East African	13 (24.1%)	2 (9.5%)
Average Age (SD)	53.9 (10.6)	60.3 (8.3) *
Female (%)	17 (31.5%)	11 (52.4%) *
Privately Insured (%)	31 (57.4%)	15 (71.4%)
Married (%)	21 (38.9%)	7 (33.3%)
Interpreter (%) (n=7)	6 (11.1%)	1 (4.8%)
Language (%) (n=7)	Oromo 2/6	
	Somali 4/6	Somali 1/1

Notes: SD = Standard Deviation

* Differences significant at 0.05 level

Appendix L
Number Actions Taken Given Baseline Status on LDLs and Medications by Time Period

	Baseline Sample Size	LDL<100 19				LDL>=100 56			
		On Meds		No Meds		On Meds		No Meds	
	Group	1		2		3		4	
	Sample Size	15		4		**28**		28	
	# Actions Taken In Each Time Period		% No Action		% No Action		% No Action		% No Action
T1	At Goal	15		4					
	0 actions	13	86.7%	4	100%				
	1 action	2	13.3%						
	2 actions								
	Not at Goal					28		28	
	0 actions					17	60.7%	13	46.4%
	1 action					10	35.7%	15	53.6%
	2 actions					1	3.6%		
T2	At Goal	11	73.3%	2	50.0%	4	14.3%	3	10.7%
	0 actions	10	90.9%	2	100%	4	100%	2	66.7%
	1 action	1	9.1%					1	33.3%
	2 actions								
	Not at Goal	4	26.7%	2	50.0%	24	85.7%	25	89.3%
	0 actions	2	50.0%	2	100%	20	83.3%	15	60.0%
	1 action	2	50.0%			4	16.7%	10	40.0%
	2 actions								
T3	At Goal	11	73.3%	1	25.0%	6	21.4%	4	14.3%
	0 actions	8	72.7%	1	100%	6	100%	4	100%
	1 action	3	27.3%						
	2 actions								
	Not at Goal	4	26.7%	3	75.0%	22	78.6%	24	85.7%
	0 actions	3	75.0%	1	33.3%	17	77.3%	15	62.5%
	1 action	1	25.0%	2	66.7%	5	22.7%	9	37.5%
	2 actions								
T4	At Goal	6	40.0%			8	28.6%	3	10.7%
	0 actions	6	100%			8	100%	3	100%
	1 action								
	2 actions								
	Not at Goal	6	40.0%	1	25.0%	11	39.3%	11	39.3%
	0 actions	4	66.7%			11	100%	6	54.5%
	1 action	1	16.7%	1	100%			5	45.5%
	2 actions	1	16.7%						

	did not have 4 visits	3		3		9		14	
	At Goal	5	33.3%	1	25.0%	3	10.7%	2	7.1%
	0 actions	5	100%	1	100%	3	100%	2	100%
	1 action		0.0%				0.0%		0.0%
	2 actions		0.0%				0.0%		0.0%
	Not at Goal	1	6.7%			6	21.4%	3	10.7%
	0 actions	1	100%			5	83.3%	2	66.7%
	1 action		0.0%			1	16.7%	1	33.3%
	2 actions		0.0%				0.0%		0.0%
	did not have 5 visits	9		3		19		23	
T6	At Goal	4	26.7%			4	14.3%	1	3.6%
	0 actions	4	100%			4	100%	1	100%
	1 action								0.0%
	2 actions								0.0%
	Not at Goal	2	13.3%			2	7.1%	1	3.6%
	0 actions	2	100%			1	50.0%	0	0.0%
	1 action					1	50.0%	1	100%
	2 actions								
	did not have 6 visits	9		4		22		26	
T7	At Goal	4	26.7%			2	7.1%	1	3.6%
	0 actions	4	100%			2	100%	1	100%
	1 action								
	2 actions								
	Not at Goal					2	7.1%		
	0 actions					2	100%		
	1 action								
	2 actions								
	did not have 7 visits	11		4		24		27	
T8	At Goal	2	13.3%			2	7.1%		
	0 actions	2	100%			2	100%		
	1 action								
	2 actions								
	Not at Goal	2	13.3%			1	3.6%	1	3.6%
	0 actions	1	50.0%			0	0.0%	0	0.0%
	1 action	1	50.0%			1	100%	1	100%
	2 actions								
	did not have 8 visits	11		4		25		27	
T9	At Goal	1	6.7%			1	3.6%		
	0 actions	1	100%			1	100%		

1 action				
2 actions				
Not at Goal	1	6.7%		
0 actions	0	0.0%		
1 action	1	100%		
2 actions				
< 9 visits	13	4	27	28
T10 At Goal				
0 actions				
1 action				
2 actions				
Not at Goal	1	6.7%		
0 actions	1	100%		
1 action				
2 actions				
< 10 visits	14	4	28	28

Appendix M					
Patient Issues During the Year Given Baseline Status on LDLs and Medications					
Baseline	LDL<100		LDL>=100		Total
Sample Size	19		56		75
	On Meds	No Meds	On Meds	No Meds	
Group	1	2	3	4	Total
Sample Size	15	4	28	28	75
Patient Preferences	1 (6.7%)	0	1 (3.6%	10 (35.7%)	12 (16%)
Cost	1 (6.7%)	0	5 (17.9%)	1 (3.6%)	7 (9.3%)
Appropriate Action	1 (6.7%)	0	5 (17.9%)	0	6 (8%)
Caucasian					
Sample Size	10	3	14	14	41
Patient Preferences	0	0	0	5 (35.7%)	5 (12.2%)
Cost	1 (10%)	0	2 (14.3%)	1 (7.1%)	4 (9.8%)
Appropriate Action	1 (10%)	0	2 (14.3%)	0	3 (7.3%)
African American					
Sample Size	2	1	8	8	19
Patient Preferences	0	0	0	4 (50%)	4 (21.1%)
Cost	0	0	3 (37.5%)	0	3 (15.8%)
Appropriate Action	0	0	3 (37.5%)	0	3 (15.8%)
East African					
Sample Size	3	0	6	6	15
Patient Preferences	1 (33.3%)		1 (16.7%)	1 (16.7%)	3 (20%)
Cost	0		0	0	0
Appropriate Action	0		0	0	0
All Blacks					
Sample Size	5	1	14	14	34
Patient Preferences	1 (20%)	0	1 (7.1%)	5 (35.7%)	7 (20.6%)
Cost	0	0	3 (21.4%)	0	3 (8.3%)
Appropriate Action	0	0	3 (21.4%)	0	3 (8.3%)

Appendix N				
Follow-up Issues During the Year Given Baseline Status on LDLs and Medications				
Baseline	LDL<100		LDL>=100		Total
Sample Size	19		56		75
	On Meds	No Meds	On Meds	No Meds	
Group	1	2	3	4	Total
Sample Size	15	4	28	28	75
Repeat Cholesterol Ck	12 (80%)	2 (50%)	24 (85.7%)	25 (89.3%)	63 (84%)
Therapeutic Delay in Rx	1 (6.7%)	0	3 (10.7%)	4 (14.3%)	8 (10.7%)
Adherence Issues	3 (20%)	0	10 (35.7%)	5 (17.9%)	18 (24%)
Elevated Labs (re Group 2)	3 (20%)	0	3 (10.7%)	0	6 (8%)
Caucasian					
Sample Size	10	3	14	14	41
Repeat Cholesterol Ck	7 (70%)	1 (33.3%)	13 (92.9%)	11 (78.6%)	32 (78%)
Therapeutic Delay in Rx	0	0	1 (7.1%)	2 (14.3%)	3 (7.3%)
Adherence Issues	1 (10%)	0	2 (14.3%)	1 (7.1%)	4 (9.8%)
Elevated Labs (re Group 2)	1 (10%)	0	0	0	1 (2.4%)
African American					
Sample Size	2	1	8	8	19
Repeat Cholesterol Ck	2 (100.0%)	1 (100.0%)	7 (87.5%)	8 (100.0%)	18 (94.7%)
Therapeutic Delay in Rx	0	0	2 (25%)	1 (12.5%)	3 (15.8%)
Adherence Issues	0	0	3 (37.5%)	2 (25%)	5 (26.3%)
Elevated Labs (re Group 2)	1 (50%)	0	2 (25%)	0	3 (15.8%)
East African					
Sample Size	3	0	6	6	15
Repeat Cholesterol Ck	3 (100.0%)		4 (66.7%)	6 (100.0%)	13 (86.7%)
Therapeutic Delay in Rx	1 (33.3%)		0	1 (16.7%)	2 (13.3%)
Adherence Issues	2 (66.7%)		5 (83.3%)	2 (33.3%)	9 (60%)
Elevated Labs (re Group 2)	1 (33.3%)		1 (16.7%)	0	2 (13.3%)
All Blacks					
Sample Size	5	1	14	14	34
Repeat Cholesterol Ck	5 (100.0%)	1 (100.0%)	11 (78.6%)	14 (100.0%)	31 (91.2%)
Therapeutic Delay in Rx	1 (20%)	0	2 (14.3%)	2 (14.3%)	5 (14.7%)
Adherence Issues	2 (40%)	0	8 (57.1%)	4 (28.6%)	14 (41.2%)
Elevated Labs (re Group 2)	2 (40%)	0	3 (21.4%)	0	5 (14.7%)