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AN EXAMINATION OF THE ENHANCED PRIMARY CARE MODEL FOR THE ORGANIZATION OF TEAM CARE IN MANAGING TYPE 2 DIABETES MELLITUS IN THE ELDERLY POPULATION

by

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ABSTRACT

AN EXAMINATION OF THE ENHANCED PRIMARY CARE MODEL FOR THE ORGANIZATION OF TEAM CARE IN MANAGING TYPE 2 DIABETES MELLITUS IN THE ELDERLY POPULATION

Carolyn Morcom Rutledge
Old Dominion University, 2001
Director: Dr. Stacey Plichta

The healthcare system is faced with overwhelming demands as a result of the growing elderly population, especially those with chronic illnesses. One disease that significantly impacts the morbidity and mortality of the elderly population, especially the minority and poor population, is type 2 diabetes. This population often lacks access to resources and quality healthcare that may be due to inadequate knowledge by the patients and their healthcare providers regarding available services. Current models of healthcare have not been effective in meeting the healthcare demands of this population. The purpose of this study was to evaluate the effectiveness of the Enhanced Primary Care Model as a theoretical framework for designing a program aimed at training providers to care for elderly patients with type 2 diabetes.

A quasi-experimental design was used to assess the effectiveness of the Enhanced Primary Care Model. Two family practice residency clinical sites, an intervention site and a comparison site, participated in this study. An interdisciplinary diabetes team was created at the intervention site. The team developed and implemented programs to train the physicians at this site to provide team-based care for elderly patients with type 2 diabetes. The interdisciplinary diabetes team consisted of a family physician, a nurse practitioner, a nutritionist, a psychologist, a chaplain, a research nurse practitioner, and a database manager. The team developed and implemented didactic sessions on diabetes, a

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diabetes newsletter, a resource directory, a diabetes flow sheet, a patient education file, and patient education classes. The patients and the providers at both sites were assessed before the intervention programs began and then 12 months later after the intervention. The providers were assessed on attitudes towards the elderly, attitudes towards other disciplines, referrals, and adherence to diabetes guidelines. The patients were assessed on satisfaction with the doctor-patient interaction, quality of life, and health outcomes. The only area where there was a significant difference between or within the two sites was in the area of patient satisfaction. The results of this study do not support the use of the Enhanced Primary Care Model as a theoretical framework for improving provider or patient outcomes.

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This dissertation is dedicated to my husband and
sons for their encouragement, support, and patience.

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CHAPTER I

Introduction

Significance of Study

The purpose of this study is to evaluate the effectiveness of the Enhanced Primary Care Model as a theoretical framework for designing a program aimed at training providers to care for elderly patients with type 2 diabetes. The healthcare system is faced with overwhelming demands as a result of the growing elderly population, especially those with chronic illnesses such as diabetes. Although many of the elderly live in urban areas where resources are available, often these patients are not able to access the services they need. This lack of access is often due to inadequate knowledge by the patients and their healthcare providers regarding the availability and accessibility of the resources (Helseth, Susman, Crabtree, & O'Connor, 1999). The traditional models of healthcare tend to focus on providing most of the healthcare to the elderly through one-on-one doctor-patient encounters. An alternative model for health care that is receiving some attention is the team approach. However, on the occasions when healthcare teams are utilized, they are often hierarchical teams led by physicians and based on the physician's agenda (Goldstein, 1989).

A new theory of primary healthcare being proposed by O'Conner, Solberg and Baird (1998) is the Enhanced Primary Care Model. The theoretical model of Enhanced Primary Care emphasizes teamwork as a means of meeting healthcare demands (O'Conner, Solberg, & Baird, 1998). This study tests the usefulness of the Enhanced Primary Care Model as a theoretical framework for training providers to address the healthcare needs of elderly patients with a chronic illness. Specifically, this study assesses the impact that an

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interdisciplinary team has on the way healthcare providers address the biopsychosocial conditions of elderly patients with type 2 diabetes and how those changes in provider behavior affect patient outcomes.

Background

Description of the Elderly Population

The changing demographics in the United States, specifically the aging population, are altering the roles of the healthcare system. By the early 1930's, the need for providing healthcare to many of the elderly was recognized by the American government resulting in the establishment of Medicare programs in 1965 (Board of Trustees of the Federal Hospital Insurance Trust Fund, 1992; Longest, 1994). These programs place the responsibility of maintaining the health of elderly patients on primary care providers who accept Medicare reimbursement.

The American healthcare system faces exponential growth of the population over age 65 (Calleigh, 1997). There were over 32 million Americans over age 65 in 1990, that rose to 34.4 million in 2000; a 7.5% increase over 10 years (Burner, Waldo, & McKusick, 1992; US Census Bureau, 2000). The elderly sustain a disproportionate amount of morbidity, mostly due to chronic disease, resulting in a disproportionate part of the healthcare resources being received by the elderly. Currently, the population over 65 years of age makes up 12.7 percent of the US population and accounts for 36% of the nations healthcare costs (Centers for Disease Control and Prevention: Older Adults, 1999). This continuing increase is likely to overwhelm the current healthcare system unless providers can develop new strategies for managing the healthcare needs of the elderly patient (Donaldson, Yordy, Lohr, & Vanselow, 1996).

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A common misperception related to geriatrics is that it is primarily the care of frail or institutionalized, often demented patients (Mold, Mehr, Kvale, & Reed, 1995). However, over 95% of the elderly population live independently in the community, with functional status ranging from robust good health to chronic illness and frailty (Reuben, Yoshikawa, & Besdine, 1996). One of the main goals of geriatric healthcare is to preserve the functional independence of elderly individuals so they can remain in the community (Reuben, Yoshikawa, & Besdine, 1996). Nevertheless, many elderly individuals do not receive needed healthcare services to maintain their independence. Impediments to receiving this care include provider's lack of knowledge regarding the biopsychosocial needs of the geriatric patient, negative attitudes towards elderly patients, and the relatively small number of physicians prepared to manage this population (Reuben, Yoshikawa, & Besdine, 1996; Robinson, 1996). As a result, chronic health problems, such as diabetes, are likely to pose a significant threat to the functional independence of the elderly population well into the 21st century (Centers for Disease Control and Prevention: Major Chronic Diseases, 2000).

Impact of Diabetes in the Elderly

Prevalence. Type 2 diabetes (see Figure 1) is an increasingly prevalent disease in the U.S. population, particularly among the elderly. This has resulted in diabetes being a health problem that effects approximately 20% of the population over 65 years of age (US Census Bureau, 2000: Wallace, 1999). Currently, 14 million people (5.4% of the U.S. population) have type 2 diabetes; 6.88 million of these are age 65 or older (US Census Bureau 2000; Wallace, 1999; O'Connor, Spann, & Woolf, 1998). The prevalence of diabetes has increased eight-fold since 1935, to the point where there are now

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approximately 2200 new cases of diabetes being diagnosed each day in the United States (49% of these are among the elderly) (Centers for Disease Control and Prevention: Diabetes, 1999; Harris, 1995; Hunt, Pugh & Valenzuela, 1998; Wallace, 1999).

Figure 1. Description of Diabetes.

Pathophysiology	Symptoms	Complications
Disorders in metabolism	Polyuria	Obesity
Glucose intolerance	Polyphagia	Hypertension
Insulin resistance	Polydipsia	Dyslipidemia
Decreased ability to secrete or use insulin	Blood glucose>140 mg/dl	Hyperinsulinemia
Increased with age >40		Microalbuminuria
Increased with sedentary lifestyle		Macrovascular disorders
Increased with poor food intake		Microvascular disorders
Increased with obesity		Neurological disorders
Positive family history		

Health Effects. Type 2 diabetes is a serious chronic condition that is responsible for a substantial amount of mortality, morbidity, and disability in the United States (see Figure 2). Overall, 193,000 patients with diabetes die each year from complications related to the disease, with approximately 60% being elderly (Centers for Disease Control and Prevention: Diabetes-at-a-Glance, 1999; Wallace, 1999). This makes diabetes the fourth most common cause of death in the United States (US Census Bureau, 2000; Wallace,

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1999). Seventy-five percent of these deaths are due to macrovascular complications such as heart failure and stroke (Centers for Disease Control and Prevention: Diabetes-at-a-Glance, 1999; Wallace, 1999). These deaths are often a result of diabetes induced hypertension and increased lipid levels (O'Connor, Spann, & Woolf, 1998); approximately 60% of patients with type 2 diabetes have hypertension and 30% have cardiovascular disease with at least half of these being among the elderly (Nuttall & Chasuk, 1998).

Figure 2. Health Effects of Diabetes.

Health Effects	Impact on Population
Prevalence of Diabetes	14 million
Mortality	193,000/year
Hypertension	8.4 million
Cardiovascular Disease	4.2 million
Retinopathy	8.4 million
Blindness	12-24,000/year
End-Stage Renal Disease	33,000/year
Amputations	86,000/year

Microvascular complications resulting from diabetes are another major concern for patients with diabetes. Microvascular complications include retinopathy, nephropathy, and peripheral neuropathy (O'Connor, Spann, & Woolf, 1998). Retinopathy, that can lead to damage of the retina resulting in blindness, occurs in about 60% of the patients with type 2 diabetes (O'Connor, Spann, & Woolf, 1998). Each year, between 12,000 and

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24,000 people become blind due to diabetic retinopathy (Centers for Disease Control and Prevention: Diabetes-at-a-Glance, 1999).

Diabetes is the number one cause of nephropathy or renal disease; between 20% and 30%, or approximately 33,000 patients (about 16,000 elderly), with diabetes developing end-stage renal disease each year (Centers for Disease Control and Prevention: Diabetes-at-a-Glance, 1999). A total of about 100,000 people with diabetes are treated for kidney failure each year. This figure comprises approximately half of all the patients on dialysis (O'Connor, Spann, & Woolf, 1998).

Many patients with type 2 diabetes develop a peripheral neuropathy that decreases the sensation to the lower extremities. As a result, they sustain injuries that often go unnoticed. Compounded by poor circulation, patients often develop infections that all too often result in amputations. About 50% of those individuals with lower extremity amputation have diabetes, with half of these individuals being over age 65. This equates to about 86,000 amputations per year (Centers for Disease Control and Prevention: Diabetes-at-a-Glance, 1999).

Medical Cost of Diabetes. Figure 3 includes the healthcare costs related to diabetes. Between 1960 and 1991, overall healthcare expenditures increased from 5.3% to 13.2% of the gross national product with only minimal improvement in health outcomes (O'Connor, Solberg, & Baird, 1998). People over 65 years of age with type 2 diabetes account for a disproportionate share of these expenditures (Weiss, 1998). Of these elderly with diabetes, about 4.2 million depend solely on Medicare to cover their health benefits (Diabetes Advocate, 1999). In one study, Krop and colleagues (1998) found that patients with diabetes were 1.5 times more costly to Medicare than all other Medicare beneficiaries. In

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1997, diabetes costs in the United States were approximately $98 billion, with about half this cost from patients over age 65 (Centers for Disease Control and Prevention: Diabetes-at-a-Glance, 1999; Centers for Disease Control and Prevention: Diabetes Care, 1997). Approximately $24 million is spent on hospital care each year for patients with diabetes (Centers for Disease Control and Prevention: Diabetes, 1999). At an average cost of $51,000 per person, the total cost of kidney failure due to diabetes exceeds $5.1 billion annually. Each year, amputations resulting from diabetes occur at a cost of $860 million in hospital costs alone (Centers for Disease Control and Prevention: Diabetes-at-a-Glance, 1999).

Figure 3. Medical Costs related to Diabetes.

Complication	Approximate Yearly Cost
Total Cost	$98 billion
Hospital Care	$24 million
Kidney Failure	$5.1 billion
Amputations	$860 million

Overall, diabetes in the elderly has a tremendous impact on the US population through healthcare cost as well as morbidity and mortality. The total cost ranks among the highest for any disease in the country. It is one of the four most prevalent diseases and affects more bodily systems than any other disease. It results in complications such as blindness, kidney failure, amputations, and neuralgia. However, it is a disease that can be

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controlled with minimal complication and costs provided both the patient and the provider are compliant with well tested guidelines for managing the disease.

Traditional Models of Healthcare

Over the past 50 years, a number of models of healthcare have been introduced as a means of improving the quality and efficiency of care of patients with chronic disease while decreasing the cost. In 1950, family practice was envisioned as a means of meeting the healthcare needs of the population as a whole through one-on-one encounters (Rivo, 1997). In the 1960's, general practice became a declining field, replaced by subspecialty practices (Rivo, 1997). The subspecialty model focuses on having subspecialists rather than primary care physicians provide care for specific conditions. Subspecialty practices were developed as a way to provide patients with better care from providers with more knowledge in one specific clinical area. However, some studies have shown this model of care to be expensive, to have a tendency to fragment patient care among various providers, and not to consistently improve healthcare outcomes (O'Connor, Solberg, & Baird, 1998). Furthermore, patients treated by subspecialists may receive inferior care for other health problems they have.

In the 1970's, the trend changed once again to a third model of care. Importance was then placed on having a personal physician who could care for a patient's many healthcare needs. In addition, the care of families and communities became a primary healthcare goal (Rivo, 1997). With this trend, primary care physicians have been trained to provide episodic care through one-on-one visits to a wide range of patients (Rust, 1997). The main focus of this model has been on treating acute conditions. Even the management of chronic conditions and prevention has been provided in an episodic manner more

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appropriate for acute conditions (O'Connor, Solberg, & Baird, 1998). Providers have been trained to respond to acute and urgent needs rather than to provide ongoing, long-term management of chronic conditions (National Chronic Care Consortium, 1998). As a result, patient care for those with chronic conditions became fragmented and more costly with minimal improvements in health outcomes (O'Connor, Solberg, & Baird, 1998; Rivo, 1997).

A fourth model, the patient self-care model was subsequently developed in the 1980's. This model focuses on having the patient partner with the physician in managing care. This approach is dependent on the patient making behavioral changes that will impact health (O'Connor, Solberg, & Baird, 1998). Limitations to this model include the fact that there have been no consistently effective approaches to creating behavioral changes; the patient is given incentives not to seek out providers that can result in delayed medical care; and it may be used as a substitute for needed clinical care (O'Connor, Solberg, & Baird, 1998). Furthermore, this approach puts the burden of care on the patient without creating a supportive atmosphere of resources.

In order to address the rising cost of healthcare, managed care programs were developed in the early 1970's and implemented in the late 1980's. However, the managed care programs that have become the current trend do not focus on addressing the needs of the elderly. Instead, the focus is on prevention and on decreasing the cost of healthcare by dictating how healthcare is provided (Rivo, 1997). As a result, both consumers and payers began to expect more for their dollar, but they did not obtain the results that were expected (Rivo, 1997). Both providers and chronically ill patients have encountered formidable obstacles in achieving effective clinical care outcomes through managed care

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(Wagner, Austin, & Von Korff, 1996). Marketing has focused on selective enrollment of young healthy individuals, discouraging care for the chronically ill elderly patient (Wagner, Austin, & Von Korff, 1996). Furthermore, organizing care around 15-minute visits does not allow for comprehensive assessment, care planning, counseling, or telephone contact needed for successful management of chronically ill patients (Wagner, Austin, & Von Korff, 1996). Physician productivity is often measured by an increased number of visits and technical procedures. Furthermore, the responsibility for follow-up care is placed on the patient. Often, many of the needs of the chronically ill patients can best be served by nonphysicians. Yet, these nonphysician services are often not reimbursed.

New models of care such as the Enhanced Primary Care Model are now being explored to help meet the healthcare needs of the elderly population while controlling costs. Linkages to community services and resources have been found to be instrumental in sustaining elderly patients, especially those with chronic illnesses, in their homes. In addition, these linkages have been found to improve quality of life (Allessi, Stuck, & Aronow, 1997; Eng, Pedulla, Eleazer, McCann, & Fox, 1997). Nevertheless, it has been found that many physicians lack the knowledge and time needed to aid geriatric patients with chronic illnesses (such as type 2 diabetes) in accessing resources (Helseth, Susman, Crabtree, & O'Connor, 1999). Given the complexity of chronic care, the need for interdisciplinary care with emphasis on community resource utilization, as described in the Enhanced Primary Care Model, is well recognized. Specifically, interdisciplinary team models, as opposed to the other models of care, have been more effective in managing healthcare needs of chronically ill patients. The teams are more effective as a result of emphasizing needs assessment, access to care, benefits verification, engagement in

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community resources, information exchange among providers, the prevention of service fragmentation and duplication, and patient advocacy (Eggert, Zimmer, Hall, & Friedman, 1991; Fitzgeral, Smith, Martin, Freeman, & Katz, 1994). Incorporation of case-management services into geriatric care where teams manage the healthcare has been shown to result in fewer episodic care visits, a reduced hospitalization rate, and other outcomes that have potential for greater cost-effectiveness and quality of geriatric care (McDowell, McMahon, Godschalk, & Mulligan, 1996).

Even though the need for interdisciplinary team care that focuses on community resources is generally recognized, many physicians tend to gravitate towards the traditional model of one-on-one care with the patient (Drinka, 1994). When physicians do encounter interdisciplinary teams, they perceive the teams as hierarchical, physician-led groups (Goldstein, 1989). This hierarchical model is appropriate when technologic expertise is needed to achieve a specific, clear-cut goal. A non-hierarchical interdisciplinary team, as proposed in the Enhanced Primary Care Model, is far more suited for elderly patients with chronic illnesses. These patients are hypothesized to benefit from a model of care where healthcare is provided as a result of a non-hierarchical team approach where decisions are shared, multiple points of view are valid, end points are relative, varied talents are needed, and circumstances change over time (Qualls & Czirr, 1988). A successful interdisciplinary team adapts to ambiguities through democratic function, with its members rotating leadership according to needs (Donaldson, Yordy, Lohr, & Vansela, 1996).

Nevertheless, participating in interdisciplinary teams can be difficult. Task competency and effective interpersonal skills are necessary, but are not sufficient (Drinka,

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1994). In order to be successful, team members must also learn to recognize assumptions about their own models of professional behavior and understand models used by other disciplines while dismissing negative stereotypes about other professions (Siegal, 1994). With these perspectives, trainees must then learn how to arrive at shared values, handle conflicts and disagreements, negotiate common goals, and demonstrate flexibility in team implementation (Drinka, 1991). These new skills are needed if providers are going to be able to move toward team care as a means of meeting the changing healthcare needs.

Management of Elderly Patients with Diabetes: Current Status

Tight control of diabetes by both the provider and the patients can result in greatly improved health outcome. Tight control consists of strict adherence to exercise programs, dietary management, medication, and other medical approaches that result in a HgA1c level below 7.0%. When diabetes is not under control or the HgA1c is not kept under 7.0%, serious complications can occur. It was shown through the United Kingdom Prospective Diabetes Study (UKPDS) with 5000 participants, that strict adherence to guidelines for managing diabetes can have a significant impact on the HgA1c (Genuth, 1998). In this study, with strict adherence to guidelines, investigators were able to decrease the average HgA1c level from 9.1% to 7.0%. As a result of this intensive therapy, the complications from diabetes were decreased by 12%. Strict adherence to guidelines for diabetes can have a financial impact as well. For each $1 spent on outpatient education for diabetes, there can be a $2-3 savings in the cost of hospitalization (Centers for Disease Control and Prevention: About Chronic Disease, 1999). Even though the advantages of tight control is well recognized, this tight control of diabetes is

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accomplished in only about 30% of the people diagnosed with the disease (Weiss, 1998; O'Conner, Solberg, & Baird, 1998).

Failure to make behavioral changes has been shown to result in serious complications (Hunt, Pugh, & Valensuela, 1998). Needed behavioral changes include following a diabetic diet, participating in exercise, assessing feet for complications, and monitoring blood glucose levels. Clinical research has shown that following a diabetic diet can increase the body's sensitivity to insulin as well as improve the lipid level and blood pressure (Wallace, 1999). This in turn decreases the complications resulting from diabetes. Diet recommendations include a low-fat (<30% of the total calories) high-carbohydrate (>50% of the calories) diet (Wallace, 1999). Exercise has also been shown to reduce insulin resistance which in turn decreases complications from diabetes (Wallace, 1999). Patients with diabetes have decreased foot sensation or peripheral neuropathy making the patient unaware of lesions (Wallace, 1999). The high sugar level in the body creates an excellent medium where bacteria can grow. As a result, many patients with diabetes eventually have a lower limb amputated due to infection. Thus, patients with diabetes must become accustomed to examining their feet on regular bases in order to identify if there are any lesions. In order to modify diet and exercise programs, the patients should monitor their blood glucose levels. However, as few as 10% of the patients with diabetes routinely assess their blood glucose (Harris, Cowie, & Howie, 1993).

Even though providers recognize that diabetes is a serious condition with many severe complications, they often do not follow provider-developed protocols. Specifically, they do not always conduct recommended physical exams, referrals, and laboratory tests. In

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one study it was found that the providers examined the feet during each clinic visit at a rate of 51% (Marrero, 1994). Only 25% reported doing a thorough exam consisting of palpating pedal pulses, searching for bruits, assessing foot sensation, and checking for infection in patients at high risk for foot complications (Marrero, 1994). Even though people with diabetes can develop retinopathy that if left untreated can result in blindness, providers all too often neglect that part of the exam. It has been proven that early detection of diabetic eye disease can result in sight-saving treatment (Diabetes, 1991). It is thus recommended that patients have an eye examination with pupil dilation yearly. One study showed that primary providers referred patients with diabetes for a fundoscopic eye exam between 40-65% of the time (Diabetes, 1991). Since patients with diabetes tend to develop cardiovascular problems as a result of high lipid levels, it is recommended that providers obtain laboratory results on a patient's lipid level every year. In one study, it was found that between 91% and 93% of the providers ordered an annual fasting lipid panel (Marrero, 1994). Another study found that renal function was only assessed in 62% of the patients, even though it is well known that diabetes often leads to kidney failure and dialysis (Evaluating, 1999). A provider's compliance with recommendations may be related to knowledge or attitude regarding the disease. This was supported in a study by Weinberger, Cohen, and Mazzuca (1984), where it was shown that the physician's attitude predicted the level of control their patients had over glucose levels.

Type 2 diabetes is the second most common disease treated in primary care settings with approximately 80-95% of the patients with diabetes in the United States receiving their care from a primary care physician (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). Thus, the responsibility of maintaining tight control of diabetes rests on the

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shoulders of the primary care provider and the patients with diabetes. Both, the patient and the provider must work together in order to reduce the HgA1c level and prevent complications. Hunt and colleagues (1998) found that even though patients expressed concern about having diabetes, they often did not follow all of the recommendations for treatment. In order to improve this adherence to recommendations, the primary care provider must follow the guidelines as well as place emphasis on patient motivation, knowledge, and psychological characteristics (Hunt, Pugh, & Valenzuela, 1998). However, most providers do not utilize protocols based on practice guidelines. This can be the result of resentment of many practitioners regarding the feeling that care can be provided in a homogenized manner (Wagner, Austin, & Von Korff, 1996). Even when guidelines are well-developed and accepted, failure may occur due to a lack of clinician awareness, guidelines not being conveniently available, lack of confidence in guidelines, patient circumstances or barriers in the systems (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). In addition, the recommendations are constantly changing with the development of new guidelines, clinical pathways, and expert opinions. As a result, providers often have a difficult time staying abreast of all of the changes (Peterson, 1998). In order to address these concerns, new models of care such as the Enhanced Primary Care Model strive to overcome barriers and thus improve both patient and provider compliance with guidelines.

Urban Significance

Diabetes impacts Americans of all ages, races, and ethnic groups with the heaviest burden on elderly Americans and ethnic minorities such as African Americans, Hispanics, American Indians, and Alaskan Natives (Hunt, Pugh, & Valenzuela, 1998). These

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minority groups tend to have a higher prevalence of type 2 diabetes and poorer outcomes than White Americans (Hunt, Pugh, & Valenzuela, 1998). For instance, American Indians and Alaskan Natives are 2.8 times more likely to develop diabetes than white Americans (Centers for Disease Control and Prevention: Diabetes-at-a-Glance, 1999). African Americans are 1.7 times and Hispanics are 1.5 times more likely to have diabetes than white Americans (Minority Groups, 1999). Furthermore, lower extremity amputations occur 8.5 times more frequently in minority groups than among Whites (Saunders, 2000); post-operative complications have also been shown to be higher among minority patients (Rith-Najarian, Branchaud, & Beaulieu, 1998). These statistics may be due to problems with access to care as well as to sociocultural issues (Saunders, 2000). The problem is compounded in that the patient with diabetes are often left to figure out how to manage their diabetes within the constraints of the inner city environment in which they live (Hunt, Pugh, & Valenzuela, 1998).

Minorities and low income individuals have an especially hard time adhering to treatment recommendations because of low income, low levels of literacy, and language barriers (Hunt, Pugh, & Valenzuela, 1998). In a study by Hunt and colleagues (1998) that focused on 51 patients with type 2 diabetes mellitus seen in low income clinics in two cities in Texas, it was found that economic cost of managing diabetes was a high concern for the patients. Seventy-four percent of the patients stated that cost was a deterrent to managing their diabetes, even with sliding fee schedules. Many patients stated that financial limitations limited their ability to stay on the recommended diet. Patients found the fresh fruit and vegetables recommended for patients with type 2 diabetes to be quite expensive. The cost of medications and supplies needed to manage diabetes was also

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found to be a burden for many low-income patients. As a result, patients often took the medications either when they felt bad or every other day rather than as prescribed. In response to the financial constraints of many patients with diabetes, some pharmaceutical companies have begun providing prescription assistance programs (D'Argia, 1998). Nevertheless, this program has not been totally successful since many patients as well as their providers are unaware of the programs. This is especially problematic since a physician must complete forms for patients before the patient can receive the medications at low or no cost (D'Arrigo, 1998).

Poverty has also kept many patients with type 2 diabetes mellitus from participating in recommended exercise programs. Patients in the inner city are often hesitant to walk in the city due to safety concerns (Hunt, Pugh, & Valenzuela, 1998). Suggested strategies such as walking in the mall or in the park are often not feasible due to costly bus fares. Furthermore, the use of health clubs is often out of the question due to the high expense (Hunt, Pugh, & Valenzuela, 1998). This frequently results in insufficient exercise by the lower income patients with type 2 diabetes.

Statement of the Problem

The current system of healthcare falls short of helping patients with diabetes and their providers achieve clinical recommendations (Peterson & Vinicor, 1998). The traditional models of healthcare are based on the doctor and the patient interacting without input from other professionals. This approach limits the transfer of knowledge to only what the patient and the provider bring to the encounter. Often the provider is trained in the biomedical approach to healthcare and not in handling the behavioral and psychosocial issues that impact the health outcomes of elderly patients with type 2 diabetes (O'Connor,

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Spann, & Woolf, 1998). Furthermore, there are constant updates on the management of diabetes thus making it difficult for providers to stay abreast of the changes (Peterson, 1998). Even attempts to manage patients with subspecialists who stay abreast of the changes fall short. Subspecialty care of patients with diabetes tends to be more resource-intensive and costly than primary care, yet it does not produce superior clinical outcomes (O'Conner, Solberg, & Baird, 1998). In addition, there continues to be barriers to making the behavioral changes needed to control diabetes.

There is an increasing need for physicians to learn how to better assist those patients with limited abilities, resources, and money. For instance, strategies to help decrease healthcare cost may include teaching patients to reuse syringes and needles, decreasing the number of home glucose readings, phoning patients rather than having office visits, and developing appropriate food strategies that are not so costly (Hunt, Pugh & Valenzuela, 1998). Strategies such as these, are time-consuming and require input from different types of healthcare providers.

Studies have shown that when providers and patients work together in teams and are aggressive in managing the diabetes, there can be as much as a 48% reduction in the development of complications (Rith-Najarian, Branchaud, & Beaulieu, 1998). Early detection and treatment for retinopathy can prevent up to 90% of the cases of blindness. This could result in a $470 million annual savings in the federal budget (Centers for Disease Control and Prevention: Diabetes-at-a-Glance, 1999). Tight control of diabetes could prevent at least half of the cases of kidney failure resulting in a savings of $842 million each year (Centers for Disease Control and Prevention: Diabetes-at-a-Glance, 1999). Furthermore, with careful screening and better control of the diabetes,

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approximately half of the amputations due to diabetes could be prevented (Centers for Disease Control and Prevention: Diabetes-at-a-Glance, 1999).

Although there have been many studies of diabetes, little work examining the effectiveness of different models of care has been conducted. Further, most of the studies focus on the patients requiring insulin (type 1 diabetes) as opposed to those patients with type 2 diabetes (Peterson, 1998). There are minimal studies available about the impact of the healthcare system on disability, quality of life, and functional status (O'Conner, Solberg, & Baird, 1998). In addition, there have been very few studies on the effectiveness of disease management teams (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). The few studies that do exist tend to focus on programmatic interventions, are often nonexperimental, or are not disease specific. In addition, many of these studies do not describe how practice guidelines were used. There is a need to carefully examine models of care that have the potential to improve healthcare outcomes of patients with diabetes at a higher rate than the current 30%. With the present trends in the healthcare market, the traditional models of providing and evaluating care are not adequate or viable long term (O'Conner, Solberg, & Baird, 1998).

Since 1960, there have been only minimal improvement in health-related outcomes on a population basis, even though costs for diabetes have increased (O'Conner, Solberg, & Baird, 1998). In order to improve the management of patients with diabetes, new strategies are needed. One potential strategy is the Enhanced Primary Care Model. The Enhanced Primary Care Model has been developed in an attempt to overcome some of the limitations found in the traditional models of healthcare. This model suggests that care

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provided for patients with a chronic illness through a team-based approach should be superior to care provided via traditional means.

Patients with type 2 diabetes are prime candidates for the interdisciplinary team approach proposed in the Enhanced Primary Care Model. The proper management of diabetes is complex, needs to utilize a variety of health-related disciplines, and involves a focus on self-management and behavioral changes (Funnell, 1996). Even though a team approach is a promising way to address these issues, this often does not occur due to several factors. First, through recent changes in healthcare reimbursement, many chronically ill patients are treated in outpatient settings where it is often difficult to implement a team approach. Barriers are related to the time-consuming nature of teams, the fact that the services of many disciplines are not reimbursed, and that teams outside of inpatient settings require greater teamwork and communication skills (Funnell, 1996). Communication difficulties are increased by the fact that many professionals work at different sites and on different days (Funnell, 1996). Furthermore, although primary care physicians are the main caregivers for a majority of the people with type 2 diabetes in the United States, many of them have not been trained to provide team-based care to patients (Harris, Cowie, & Howie, 1993).

Although, the individual constructs of the Enhanced Primary Care Model have been successfully implemented in research settings, application and testing in the real-world setting has lagged. Furthermore, the model has yet to be tested in its entirety in any setting. In order to determine the effectiveness of the Enhanced Primary Care Model in today's healthcare market, clinics and healthcare systems must invest resources in selecting measurable goals, developing and implementing primary care teams, developing

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and utilizing clinical databases, applying effective approaches to behavioral changes, and implementing evidence-based clinical guidelines (O'Connor, Solberg, & Baird, 1998).

Purpose of the Study

The purpose of this study is to evaluate the effectiveness of the Enhanced Primary Care Model as a theoretical framework for training providers to care for elderly patients with type 2 diabetes. Specifically, this study will examine the impact an interdisciplinary healthcare team has on improving the way healthcare providers address the healthcare needs of elderly patients with type 2 diabetes. There will be two sites assessed in this study, the intervention site and the comparison site. The intervention site is a family practice clinical and residency program that will receive an intervention from an interdisciplinary diabetes team based on the Enhanced Primary Care Model. The comparison site is a family practice clinical and residency program that will not receive an intervention. In this study, family physicians, family practice residents, geriatric patients with type 2 diabetes, and the interdisciplinary diabetes team will be assessed.

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CHAPTER II

Theoretical Framework

The theoretical framework utilized in this project is the Enhanced Primary Care Model developed by O'Connor, Solberg, and Baird (1998) (see Figure 4). This model outlines the activities that, if engaged in, are predicted to improve the healthcare outcomes of a patient population. The Enhanced Primary Care Model maintains that employing clinical tools along with quality improvement methods will improve health outcomes. The clinical tools include patient registries, clinical guidelines, computerized tracking, monitoring, targeting and triage tools, telephone outreach, standing orders, flow sheets, self-monitoring technologies, individualization of therapy, use of subspecialty expertise, and the formation of multidisciplinary teams that use continuous quality improvement methods (O'Conner, Solberg, & Baird, 1998). Each approach has been individually tested and is compatible with the values and experiences of the primary care physician. In addition, these tools have been found to work successfully for short periods of time in research settings with specified groups of patients (O'Conner, Solberg, & Baird, 1998).

The Enhanced Primary Care Model uses clinical tools while maintaining primary care attributes such as continuity of care, doctor-patient relationships, and patient support for autonomy and responsibility (O'Conner, Solberg, & Baird, 1998). The constructs include goal setting for a specified problem, assembly of an interdisciplinary team, development and utilization of a patient database, implementation of programs to create behavioral changes, implementation of clinical guidelines, and assessment of healthcare outcomes. The first step according to the Enhanced Primary Care Model is to identify a population with a health problem and set goals for improving their health. Once a problem has been

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identified and goals have been set, an interdisciplinary team is assembled to accomplish the goals. The interdisciplinary team should develop and utilize a patient database in order to assess, monitor, and track members of the patient population. Based on the database, the team should develop and implement behavioral approaches and evidence-based clinical guidelines. After these methods have been implemented, the interdisciplinary team should assess the healthcare outcomes of the patient population. Specifically, outcomes should demonstrate improved efficiency and effectiveness of clinical care if implemented properly. Outcomes can focus on clinical and behavioral changes in the patient as well as behavioral changes among providers. Examples of expected outcomes regarding patients with illnesses such as diabetes include a decrease in HgA1c levels, annual retinal examinations, and decreased LDL levels (O'Connor, Solberg, & Baird, 1998). The information from the assessment can be used to provide feedback to the patients, providers, and interdisciplinary team (O'Conner, Solberg, & Baird, 1998).

The Enhanced Primary Care Model is recommended as a framework for addressing the healthcare concerns related to chronic illnesses such as diabetes where the illness is complex and requires behavioral as well as biomedical management (O'Connor, Solberg, & Baird, 1998). However, while components of the model have been tested in research settings with chronic illnesses including diabetes, cancer, and cardiovascular disease, the model has not been tested in its entirety (O'Connor, Solberg & Baird, 1998). Furthermore, the model has not had widespread application in a real-world practice (Solberg, Reger, Pearson, Cherney, O'Connor, Freeman, Lasch, & Bishop, 1997). Through an extensive literature search, it was found that models with some of the same constructs had encountered the same lack of testing and application. The model is shown

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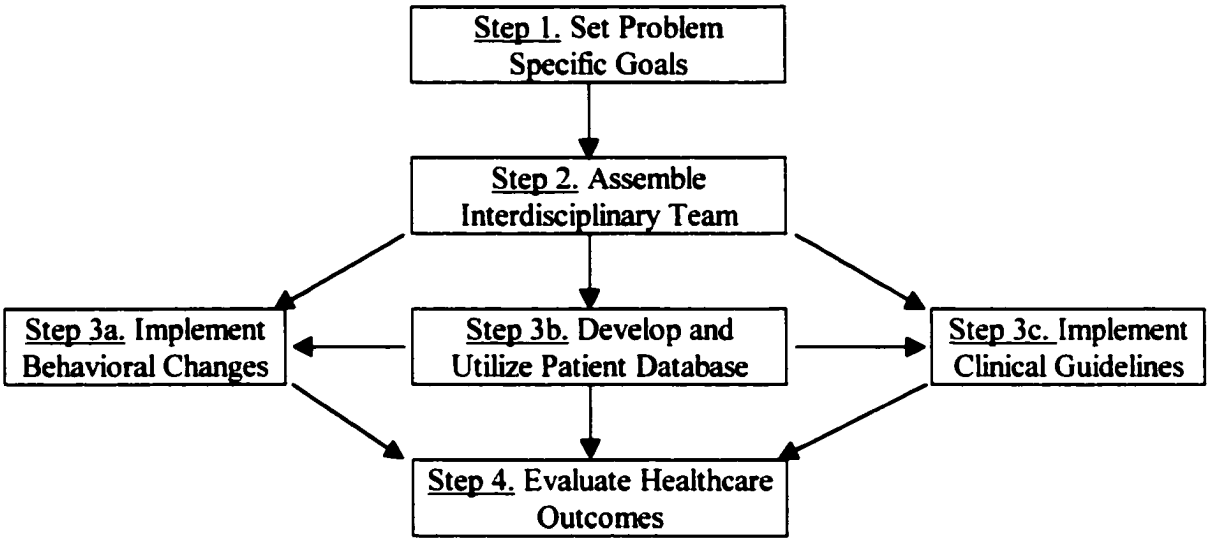
in Figure 4. Each construct of the Enhanced Primary Care Model, along with previous testing and its use in clinical settings, will be discussed in the following sections.

Figure 4. Enhanced Primary Care Model.



Set Problem Specific Goals

The first step in the Enhanced Primary Care Model is to set goals for managing a population with a disease or condition that would be best suited for management as outlined by the model. The condition should be one that is best managed through a teamwork focus as opposed to individual basis. It should also have a set of commonly accepted practice guidelines and intervention strategies for managing the disease (Weiss, 1998). Conditions that are more prevalent in the population are better suited to this model as resources pulled together for an interdisciplinary team are more cost effective if a large number of people are reached.

Type 2 diabetes meets many of the criteria for management with the Enhanced Primary Care Model. It is a prevalent, yet complex problem found in our society with well-tested guidelines and strategies for managing the care (see Figure 5). The problem in

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managing patients with type 2 diabetes is that often the guidelines are not followed by either the patient or the provider (Peterson, 1998). This can be the result of the provider not being aware of the current guidelines, or of the patient not being knowledgeable or compliant.

Figure 5. American Diabetes Association Guidelines.

Measures	Frequency
HbA1c	≥ 1 time/year
Eye Exam	1 time/year
Foot Exam	≥ 1 time/year
Blood Pressure	≥ 2 times/year
Urine Protein Measurement	1 time/year
Lipid Profile	1 time/year
Self-Management Education	Several sessions over year
Medical Nutrition	Several sessions over year
Self-Monitoring of Glucose	At least once

According to the Enhanced Primary Care Model, once a healthcare problem has been identified for the model's approach, goals for improving the healthcare should be established. Once a goal is identified, the interdisciplinary team is better able to determine what needs to be done, when, and by whom (Peterson & Vinicor, 1998). The team is then able to plan and implement needed interventions. In establishing goals, there must be a compromise between ideal management and what would be realistic for the patient

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(Helseth, Susman, Crabtree, & O'Connor, 1999). Many interdisciplinary teams are structured based on the goal of keeping the patient well (Helseth, Susman, Crabtree, & O'Connor, 1999). Goals specific to diabetes tend to focus on good glycemic control and prevention of complications (Helseth, Susman, Crabtree, & O'Connor, 1999). The goal should be presented at the first team meeting to ensure that everyone is aware of the charge and the standards for working together (Schwartz, Landis, & Rowe, 1999). It has been found that when team members do not understand what the goal of the team is, they are more often reluctant to participate (Schwartz, Landis, & Rowe, 1999). By understanding the goal, members are better able to fully participate in the team process (Schwartz, Landis, & Rowe, 1999).

There are a number of goals for managing patients with diabetes that are in keeping with the construct of goal setting in the Enhanced Primary Care Model. Some of the clinical goals that are appropriate when working with patients with diabetes include having (1) a blood pressure of below 130/85 mm Hg, (2) a fasting glucose level below 7 mmol/L, (3) a HbA1c below 7%, and (4) a cholesterol level below 200 (McGregor, 1999). It has been shown that when groups set a goal to decrease the average HbA1c, the HbA1c has been brought under control (Genuth, 1998; O'Connor, 1998). Goals associated with reducing the complications of diabetes can focus on decreasing the occurrence of the neuropathy, retinopathy, and nephropathy that can result in amputations, blindness, and kidney failure. Teams can also focus on goals related to behavioral changes such as patient compliance to diet, exercise, and medications. In addition, behavioral goals may address provider compliance with guidelines for managing patients with diabetes and providers having a positive attitude towards working with elderly populations.

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Assemble Interdisciplinary Team

The second step in the Enhanced Primary Care Model is to develop an interdisciplinary team to help manage the chosen condition. According to McIntyre and Dickinson (1992), successful teams consist of both taskwork and teamwork. Taskwork is the technical aspect of working together. It consists of the knowledge and skills acquired through professional experience and training. Teamwork is composed of the behavioral skills needed to be able to work together. Dickinson and McIntyre's (1996) Teamwork Model defines the skills and behaviors needed for teamwork to be effective in measurable behavioral terms (see Appendix A). The components in the model include team orientation, team leadership, monitoring, feedback, backup, and coordination. Team orientation (cohesiveness, attitudes towards one another and tasks) and team leadership (provision of direction and support for the other members of the team) are pre-conditions for teamwork. The core behavioral components include monitoring (observing the activities of team members), feedback (sharing information with team members), and backup (understanding the roles of the team members in order to provide mutual assistance). The predicted result of effective teamwork is coordination (the execution of activities by members of the team with optimal efficiency and timing). Communication links all of the components in the model. Team members coordinate their activities by monitoring other members' performance, communicating, and providing feedback and backup as needed. The predicted results include a team that focuses on improving team function rather than individual success and performance (McIntyre & Dickinson, 1992).

An interdisciplinary approach is needed in a healthcare environment where there is an increase in sophisticated technology, an aging diverse population, longer survival of

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persons with chronic diseases, a great need for prevention, medical knowledge proliferation, and pressure to limit costs (Goldstein, 1989). A team approach is most appropriate when no one person in a practice knows everything about the condition, when the process involves more than one discipline, and the solutions require creativity (Schwarz, Landis, & Rowe, 1999). Teams that are effective in healthcare tend to consist of different clinical providers such as physicians, nurses, and other allied health professionals who play an important role in achieving optimal outcomes (Weiss, 1998). Team members with different expertise are able to offer different strategies to the team regarding the management of patients with the chosen condition. Teams should be small enough to maintain the individuality of the team members yet large enough to be more efficient and powerful than a single individual (Koulokov, 1999). A team is more effective if it allows for individual expression, a sense of meaning for the members, and collective power (Koulokov, 1999). Effective interdisciplinary teams consist of team members who share responsibility and authority for goal setting, planning, problem-solving, decision-making, implementation, and evaluation of the tasks needed to accomplish a goal (Drinka, 1994). Teams are most effective when the team members are trained in optimal management of a condition as well as in interdisciplinary care (Funnell, 1999).

Studies have shown that teams that meet on regular intervals have better care and better clinical outcomes among their patients with diabetes (Farmer & Coulter, 1990; Wagner, Austin, & Von Korff, 1996). By meeting at regular intervals, teams are able to identify successes and barriers to accomplishing their goals. They are then better able to address the barriers in a timely manner. Teams that meet regularly have team members

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that are better informed and are able to provide support and encouragement for each other (Wagner, Austin, & Von Korff, 1996).

An interdisciplinary team approach is recommended for patients with diabetes because of the multidisciplinary nature of treatment (Peragallo-Dittko, Godley, & Meyer, 1995). Management of patients with type 2 diabetes consists of primary prevention, diagnosis, treatment, and rehabilitation requiring input from a number of professionals (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). The delegation of tasks to appropriate team members is a central feature in successful teams (Wagner, Austin, & Von Korff, 1996; Payne, Galvin, Taplin, Austin, Savarino, & Wagner, 1995). Diabetes impacts the patient from a biological perspective resulting in numerous medical complications. The physician has the role of managing the patient's clinical well-being through tests, medications, and medical procedures. In order to make the behavioral changes needed to minimize the clinical complications, the patient with diabetes is in need of knowledge and skills. Often a nurse, especially one trained as a diabetes educator, is able to provide the patient with the needed training. The patient with type 2 diabetes should make changes in their diet in order to control diabetes (Peragallo-Dittko, Godley, & Meyer, 1995). A nutritionist can provide the patient with knowledge and strategies for making the needed dietary changes. A psychologist has a vital role in working with patients with diabetes, primarily as they try to learn to cope with having a chronic illness. Patients with diabetes often experience depression, anxiety, and denial as a result of the condition. Finally, a team responsible for managing patients with type 2 diabetes should have administrative support. This administrative support is vital in tracking the patients, obtaining needed clinical and educational materials, and managing the database. Although each of the

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providers could work with the patient individually, a team approach would enable all of the providers to coordinate care. This would decrease the repetition of some topics and the omission of others. Interdisciplinary teams have been used to provide patient screening, assist with patient decision making, set goals, develop protocols, provide support, provide follow-up, and monitor for complications (Funnell, 1999). These teams have been effective in improving the healthcare outcomes of patients with diabetes by improving the use of clinical guidelines (Lasch & Bishop, 1997).

Schwartz, Landis, and Rowe (1999) found that interventions with an interdisciplinary team to manage a diabetes program improved the rate of ordering HbA1c in the practice. In a study by Lasch and Bishop (1997), the HgA1c level of patients in the study decreased from an average of 8.9% to 8.4% over 18 months in a study group managed by a team, whereas, there was no change in the control group. It was also found that the providers in the same practice measured microalbumin more regularly than those at the control site. In a study by Halter and colleagues (1993), it was found that patients over 65 with diabetes who worked with a team had better glycosylated hemoglobin levels, a decreased need for medications, and lower triglycerides.

The use of interdisciplinary teams in healthcare has been further supported with other medical conditions. In a study by Vanhook (2000), stroke patients fared much better when their care was managed by an interdisciplinary team led by a nurse practitioner. The death rate decreased from 5.7 percent to 3.8 percent. Urinary tract infections dropped from 4.0 percent to 2.5 percent. Pneumonia decreased from 4.6 percent to 1.9 percent and hospital stays were reduced from one week to three days. In a study of 282 elderly patients with congestive heart failure, it was found that quality-of-life scores improved and

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healthcare costs decreased when patients were cared for by a nurse-led management team (Ellrodt, Cook, Leed, Cho, Hunt, & Weingarten, 1997). In another study of 217 depressed patients, it was found that patient satisfaction improved, adherence to antidepressants increased, and self-reported depression dropped when the patients were involved with a team (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997).

Teams have been shown to improve clinical outcomes, patient satisfaction, patient compliance, and adherence to clinical guidelines (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997; Lasch & Bishop, 1997). They are better able to address the many needs of patients with complex illnesses such as diabetes. Furthermore, teams provide team members with the support needed to reach goals in the healthcare environment. According to Ellrodt and colleagues (1997), teams have a vital role in developing and implementing systematic changes within practices. Teams are responsible for developing, implementing, and utilizing a clinical database. The team has the primary responsibility of developing and implementing behavioral programs for both patients and providers. The teams have a major responsibility for developing and implementing appropriate clinical guidelines. Finally, the team collects all outcome data on both the patients and the providers in order to provide feedback and make programmatic changes. Each of these responsibilities is discussed in more detail in the following sections.

Developing and Utilizing a Patient Database

The third step in the Enhanced Primary Care Model is to develop and utilize a patient database. An accurate characterization of the patients in a practice is core to the primary care activities (Weiss, 1998). The data should enable teams to identify practice patterns, patient outcomes, and resource utilization needs (Ellrodt, Cook, Lee, Cho, Hunt, &

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Weingarten, 1997). The database should include demographic characteristics of the patients, the number of patients with the condition, health status, patient visits, functional status, hospitalizations, and laboratory results (Weiss, 1998). In addition, the data should focus on other medical conditions, healthcare access, social situations, and emotional function (Weiss, 1998). The database can be developed by auditing the medical records, translating an existing billing database, or entering data collected directly from the patient (Weiss, 1998). Patients with diabetes should be asked questions regarding receiving retinal exams, foot exams, and knowledge of diet for the database (Weiss, 1998).

Databases have been shown to improve the ability of teams to provide care to patients with chronic illnesses. A database can be utilized to improve the efficiency and effectiveness of teams and practices. Databases can be used for patient recall and follow-up, for providing patients with feedback, for referring patients, and to provide total quality improvement. Databases assist in understanding prevailing practices and measuring the impact of the healthcare programs (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). In addition, databases have been shown to improve clinical outcomes. Computerized clinical systems have decreased hospital charges and improved quality care by decreasing wound infections (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). Furthermore, databases have been used to assess the gap between the actual management of patients with diabetes and current recommendations (Solberg, Reger, Pearson, Cherney, O'Connor, Freeman, Lasch, & Bishop, 1997). HbA1c levels have been reduced to less than eight percent in organizations with registries and recall systems for monitoring the patient care (O'Connor, 1998; O'Connor & Pronk, 1998). Databases have also been found to enable healthcare teams to deliver more focused care to the patients (McGregor,

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1999). The database enables the providers to keep their patients up-to-date on their routine care such as lab tests and referrals (McGregor, 1999). Databases have also been used to identify other risk factors among the patients with diabetes (McGregor, 1999). Finally, databases can also be used to help keep patients from getting lost to follow-up care (McGregor, 1999).

In one study, a primary care team consisting of physicians, nurses, medical assistants, secretarial staff, and the clinical manager was assembled to manage clinical problems related to diabetes (Solberg, Reger, Pearson, Cherney, O'Connor, Freeman, Lasch, & Bishop, 1997). A diabetes registry database was designed to display individual patient data as well as group data. Many of the data came from existing sources. Encounter data on vital signs, physical exams, and educational activities were added to the database. Data were also collected on provider activities. With the database, the team was able to document both provider compliance with guidelines and patient outcomes. As a result, many changes were made in the delivery of care. This resulted in a significant increase in foot and retinal eye examinations, more consistent approaches by physicians to diabetes care, and improved short and long-term health of the patients.

In a study by O'Connor and colleagues (1996), a continuous quality improvement team identified all of the patients with diabetes enrolled in their clinic. Patients status was assessed through a computerized database. Specific emphasis was placed on HgA1c values, other lab tests, date of last eye exam, and primary care visits. Based on the data, patients with increased HgA1c levels as well as those with no documented HgA1c test done recently were given special attention. Education protocols were implemented for providers and standing orders were developed. The standing orders allowed nurses to

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order HgA1c tests, microalbumin tests, fasting lipid panels, and serum creatinine tests. As a result, there was an improvement in glycemic control without an increase in cost with the study group, whereas, the comparison site had no improvement in glycemic control with a 29% increase in cost.

In another study, data were collected on a patient population in order to better understand their needs (Nutting, Nagle, and Dudley, 1991). Data were collected on demographics, quality-of-care issues, utilization patterns, diagnostic clusters, and description of health problems. As a result, the researchers were able to identify the types of patients in their practice. The investigators identified a need to provide programs in reproductive health and substance abuse as a result of the large number of adolescents identified in the practice. Many of the patients were smokers which indicated a need to have programs that focused on smoking cessation. The database suggested areas where provider training and clinical tools were needed.

Implement Behavioral Changes

Based on the Enhanced Primary Care Model, once patients with type 2 diabetes are identified and concerns are recognized through the use of the database, programs for creating behavioral changes should be created. These programs should be developed and implemented by the interdisciplinary team utilizing data obtained from the database and evidence-based techniques. The behavioral changes can be directed at either the providers or the patients.

Since patients with diabetes provide much of their own daily healthcare, long-term outcomes are dependent on the behavioral changes made by patients (Anderson & Funnell, 1990). According to Wagner, Austin, and VonKorff (1997), in order for behavioral

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changes to occur, both the patient and the provider must be involved in setting goals and developing a plan. Behavioral changes pertinent for patients with diabetes include changes in diet, exercise programs, medication, and monitoring for problems. According to O'Connor (1998), factors that impact success with behavioral changes include (1) whether the patient believes that the disease is serious, (2) whether the patient views the diabetes medications as positive or negative, and (3) how fearful the patient is of hypoglycemia. Behavioral changes and self-care are impacted by the patient's reliance on medications, the desire to act and feel normal, resource limitations, and the desire to be free of symptoms (Hunt, Pugh, & Valenzuela, 1998). The plan must be realistic, based on patient-specific needs, and seen as important to the patient. Patients must have knowledge and skills needed to make informed decisions. The patient should be provided with instruction as well as information regarding community resources and support programs. They must receive active and sustained follow-up by various members of the healthcare team. Information and feedback can be provided to the patients based on the information obtained through a database.

In order to encourage behavioral changes, it is important for the provider to teach the patient the principles for making decisions regarding self-care (Hunt, Pugh, & Valensuela, 1998). Patients need information on how to adapt to the various encounters in day-to-day life. It is important for the provider to understand why patients do what they do in order to better understand compliance issues. Patients should be made aware of what they can and cannot expect from their behavioral changes. The provider and the patients should work together to establish a plan for overcoming the barriers to self-care (Hunt, Pugh, & Valensuela, 1998). In order for behavioral changes to occur, the patient must feel

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supported and empowered, have a positive environment for living, be educated on needed behaviors, have supplies, and be able to communicate with their provider. Methods for creating behavioral change may include having patients use mini-recorders, sending reminder cards, telephone reminders, outreach visits, and printed educational materials (Peterson & Vinicor, 1998).

Behavioral changes are needed by many providers who care for patients with diabetes. Many strategies have been used to create changes in the way providers care for their patients. It has been shown that providers can improve clinical behaviors as a result of audits, feedback, checklists, and reminder systems (Peterson & Vinicor, 1998). Other methods for improving provider behaviors include peer-comparison profiles, hearing from opinion leaders, continued medical education, and printed educational materials (Peterson & Vinicor, 1998). In one study, behavioral changes among providers occurred as the result of a flow sheet. The frequency of having the HgA1c ordered twice a year increased from 18 % to 42 % as a result of the flow sheet (Schwartz, Landis, & Rowe, 1999).

Implement Clinical Guidelines

The implementation of clinical guidelines is another important step in providing enhanced primary care. According to the Enhanced Primary Care Model, the interdisciplinary team is responsible for developing and implementing clinical guidelines that are appropriate for the setting. Clinical guidelines are statements to assist clinicians and patients in deciding on the best clinical care for a specific situation (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). Guidelines condense a large body of knowledge into a convenient and readily useable format (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). The guidelines are often developed by the interdisciplinary team from

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literature, pathophysiological rationale, local data, and clinical judgment (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). The clinical guidelines can be used to coordinate patient care over time and between disciplines and often reflect provider practice goals.

Through practice wide implementation of clinical guidelines, goals for optimal healthcare outcomes and efficency can be better achieved (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). Methods for making providers aware of clinical guidelines may include providing checklists, feedback, didactic presentations, newsletters, and other educational materials (Peterson & Vinicor, 1998). Surveys have shown that clinicians prefer executive summaries, short manuals, or synopsis of guideline recommendations (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). It is helpful to have opinion leaders support the importance of the clinical guidelines. Programs can be introduced through rounds, small group sessions, or one-on-one (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). Concurrent feedback and office systems are important in improving compliance with guideline recommendations (Helseth, Susman, Crabtree, & O'Connor, 1999).

The American Diabetes Association (ADA) (1999) has developed guidelines for the management of patients with type 2 diabetes mellitus (see Figure 5). These recommendations include the measurement of the HbA1c at least one time a year; a yearly eye exam by an ophthamologist; examination of the feet at least annually; blood pressure readings twice a year; annual labs for urine protein and lipids; self-management education annually; and nutrition counseling annually.

The ADA has also established target clinical outcomes (see Figure 6). For instance, the goal for blood pressure in patients with diabetes is <140/90 mm Hg. Other clinical

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guidelines include prescribing Ace inhibitors to treat elevated blood pressure in patients with diabetes and enteric-coated aspirin daily to decrease cardiac events (O'Connor, 1998). Medications such as statins are recommended to control the LDL cholesterol level in patients with coronary artery disease, since statins have been shown to reduce cardiac events 57% and mortality about 25% (O'Connor, 1998; Greenfield, Kaplan, Ware, Yano, & Frank, 1988). Recommendations for random blood sugars, either drawn in the office or by the patient at home with a glucometer, should be <140mg/dl. Intensive glycemic control has been shown to reduce mortality by 36% (Peterson & Vinicor, 1998). The HbA1c indicates what the blood sugar has been running on the average over several months. The goal for the HbA1c is <8%. The Diabetes Control and Complication Trial showed that the patients with a HbA1c level below 7.5% had a significant reduction in neuropathy, nephropathy, and retinopathy (Diabetes Control, 1993).

Figure 6. American Diabetes Association Guidelines.

MEASURES	LEVELS
HbA1c	≤ 8 %
Eye Exam	No retinal changes
Foot Exam	No lesions
Blood Pressure	< 140/90 mmHg
Lipid Profile	LDL<130mg/dl
Self-Monitoring of Glucose	< 140 mg/dl

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Assess Outcomes

Outcomes are assessed to determine the success of the management of patients with diabetes. In order to assess outcomes, it is important to determine what will be measured, who will be assessed, how data will be collected, and who will be responsible (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). In the Enhanced Primary Care Model, the outcomes are assessed by employing the patient database. The data are used to assess the programs, to store and track patient information, and to identify population needs (Weiss, 1998). The interdisciplinary team is responsible for collecting and analyzing the data. If the outcomes are acceptable, existing programs should be continued. When the outcomes are not desirable, strategies are needed to improve them. As a result of the tracking, continuous quality improvement can occur, resulting in changes to the diabetes program. Overall, the assessment should be used to determine whether the goals of the program have been achieved.

In order to evaluate the current practices and the impact of the programs, clinical as well as process variables should be assessed (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997). Process variables are the activities that are performed by the provider or the patient. Process variables for managing diabetes can include patient education, periodic retinal examinations, or compliance with evidence-based guidelines (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997) (see Figure 5). Often process measures may be used as proxies for clinical outcomes when they have been correlated with clinical outcomes and when clinical outcomes are not readily available (Ellrodt, Cook, Lee, Cho, Hunt, & Weingarten, 1997).

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Clinical outcomes focus on the pathophysiological condition of the patient (see Figure 6). They include the results of laboratory tests such as HgA1c, lipid panel, and urine protein. Outcomes noted through physical examinations are also considered clinical outcomes. These include vital signs, skin lesions, and retinal changes. Complications that result from the disease are also considered clinical outcomes. Common complications consist of heart disease, amputations, blindness, and stroke. If a program is successful and tight control is maintained, the patient should have positive clinical outcomes.

Hypotheses and Research Questions

The purpose of this study is to evaluate the effectiveness of the Enhanced Primary Care model as a theoretical framework for training providers to care for elderly patients with type 2 diabetes. The initial research questions focus on the evaluation of the intervention process with primarily qualitative data. The evaluation of the intervention process addresses characteristics of the interdisciplinary team and how the team members function. The hypotheses focus on the expected outcomes of the study. Two groups of subjects are assessed for the outcome objectives. These are the providers and their patients with type 2 diabetes. Differences are assessed within each site as well as between the two sites.

A. Evaluation of intervention process (Research Questions)

1. What disciplines make up the interdisciplinary team?
2. What are the roles of the various disciplines on the interdisciplinary team?
3. What teamwork behaviors do the interdisciplinary team members perform well as measured by the teamwork scale?

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4. What teamwork behaviors do the interdisciplinary team members perform poorly as measured by the teamwork scale?
5. Do teamwork behaviors improve over time among the interdisciplinary team members as measured by the teamwork scale?
6. From the perspective of the team members, why do they believe trends in team performance occurred?
7. What data do the interdisciplinary team collect in order to train providers?
8. How does the interdisciplinary team collect the data for the training program?
9. How does the interdisciplinary team use the data in providing training to the providers?
10. What types of programs are developed to train providers in behavioral skills?
11. What types of programs are developed to train providers to use clinical guidelines?
12. What are the benefits to each program?
13. What are barriers to each program?
14. Do the interdisciplinary team members feel the team was a success?
15. What could improve the programs implemented by the interdisciplinary team?

B. **Provider Outcome Objectives (Hypotheses)**

1. The study group physicians will have a more positive attitude towards elderly patients than the comparison group physicians after the intervention

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program.

2. The study group physicians will have a more positive attitude towards elderly patients after the intervention program controlling for pretest scores regardless of provider gender, provider type, and practices site.
3. The study group physicians will have a more positive view of working closely with other disciplines than the comparison group physicians after the intervention program.
4. The study group physicians will have a more positive view of working closely with other disciplines after the intervention controlling for pretest scores regardless of provider gender, provider type, and practice site.
5. The study group physicians will refer patients with type 2 diabetes to more resources than the comparison group physicians after the intervention.
6. The study group physicians will be more compliant with the clinical guidelines than the comparison group physicians.
7. The study group physicians will more frequently document behavioral interventions than the comparison group physicians.
8. The study group providers will work better in interdisciplinary teams than the comparison group physicians after the intervention.

C. Patient Outcomes (Hypotheses)

1. The study group patients with type 2 diabetes will be more satisfied with their physicians than the comparison group patients after the intervention.
2. The study group patients with type 2 diabetes will be more satisfied with their physicians than the comparison group patients after the intervention

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controlling for pretest.

3. The study group patients will be more satisfied with their physicians after the intervention when pretest satisfaction scores, gender, and provider type are considered in the model.
4. The study group patients will have higher levels of quality of life as measured by the SF-36 than the comparison group patients after the intervention.
5. The study group patients will have more improved clinical outcomes than the comparison group patients after the intervention.
6. The study group patients with type 2 diabetes will have a better HgA1c level than the comparison group patients after the intervention controlling for pretest.

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CHAPTER III

Methods

The purpose of this study is to evaluate the use of the Enhanced Primary Care Model as a theoretical framework for designing a program aimed at training providers to care for elderly patients with type 2 diabetes.

Setting

The study was conducted in two family practice programs that are part of a Department of Family and Community Medicine (DFCM) in Virginia. The organizational chart for the DFCM is based on a hierarchical model, led by the chairman of the DFCM followed by the vice-chairman, the division directors, the faculty, and the staff. Currently, there are no true interdisciplinary teams in either residency site in the DFCM. Most of the care provided to patients is through one-on-one interactions between the providers and the patients. Although some of the faculty refer patients to other disciplines, it is mainly for consultation as opposed to collaboration.

Two family practice programs from the same medical school, separated by a river, were used for this study. One site served as the intervention site and the other as the comparison site. Both sites are responsible for providing primary care to family medicine patients. The intervention site provides care for patients primarily located within the city of Norfolk, Virginia. The comparison site, located five miles from the intervention site, provides care for patients primarily from the city of Portsmouth, Virginia. The patients seen at the two sites range in age from newborns to the elderly. Medical services provided are varied and include everything from routine histories and physicals to the complex treatment of chronic illnesses. At least 100 patients are seen for healthcare each day per

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site. A preliminary data analysis established that each practice has approximately 350 patients over 55 years of age with type 2 diabetes mellitus. There is no patient exchange between the two sites.

Both sites consist of faculty physicians who are responsible for providing care for patients as well as training the medical students at the medical school in family medicine. The faculty physicians are also responsible for providing training to the 18 family practice residents at each site. All of the residents at both sites have completed their medical school training and are in the process of advancing their knowledge and skills in family medicine in order to become family physicians. The residents are responsible for providing healthcare to their own panel of patients. The residents and faculty do not receive any formal training on the current management recommendation for patients with type 2 diabetes. Some of the providers at each site receive periodic training from pharmaceutical company sponsored sessions at unpredictable intervals.

Intervention

The intervention site is the site that received the diabetes team intervention programs examined in this study. Each intervention program was modeled on the Enhanced Primary Care Model and consisted of developing an interdisciplinary diabetes team and the programs on diabetes that the team was responsible for implementing. The programs were developed for the elderly patient with type 2 diabetes and their providers. The team developed and implemented a comprehensive geriatric diabetes intervention utilizing the Balanced Scorecard approach (see Figure 7).

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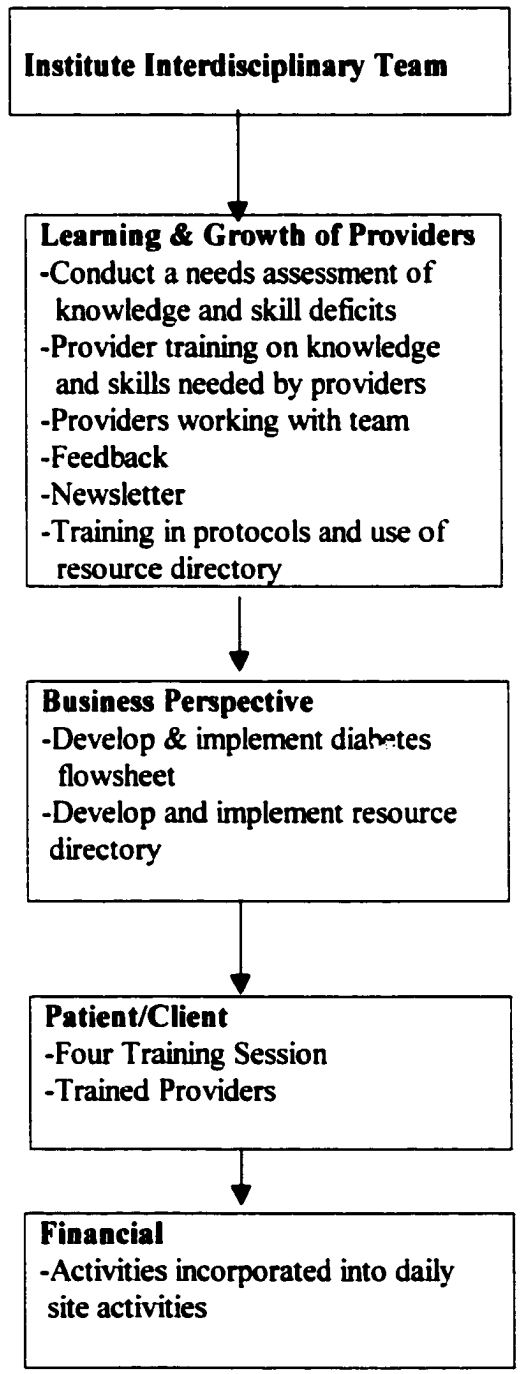
Figure 7. Study Intervention Using Balanced Scorecard Approach.



The Balanced Scorecard approach was developed by Robert Kaplan and David Norton in order to provide a description of what companies needed to address in order to be

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successful (Blodgett, 1999). It suggests that companies invest in customers, suppliers, employees, processes, technology, and innovation. The Balanced Scorecard is based on the four perspectives of learning and growth, the business process, the customer, and finances (Blodgett, 1999). The Balanced Scorecard incorporates some key concepts from total quality improvement (TQI) such as customer-defined quality, continuous improvement, employee empowerment, and measurement-based management and feedback (Castaneda-Mendez, Mangan, & Lavery, 1998). It has been applied to healthcare in order to assist senior management in designing, developing, deploying, and directing programs that are consistent with total quality management principles (Castaneda-Mendez, Mangan, & Lavery, 1998). In this study, the interdisciplinary diabetes team was responsible for designing, developing, deploying, and directing a diabetes program that utilized the Balanced Scorecard perspectives. The intervention consisted of a comprehensive diabetes program addressing the constructs of the customer (patient), the financial concerns, the business perspective, and learning/growth (Castafieda-Mendez, Mangan, & Lavery, 1998).

First, the interdisciplinary diabetes team provided training (learning and growth perspective) to the family practice physicians and residents. The programs included didactic and small group training. Attention was placed on providing programs that could be incorporated into the daily activities of the organization so that costly time was not taken away from patient care (financial perspective). The programs focused on the needs of the elderly patients with type 2 diabetes, as well as on the benefits and barriers to receiving the needed services (internal and customer perspective). The needs were identified through data collected by the investigator on patients, providers, and

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teams prior to assembling the interdisciplinary diabetes team. The interdisciplinary team was responsible for developing and implementing diabetes programs that would expedite the care provided to the patients in a cost-effective manner (business process perspective). The team developed protocols and a resource directory for the providers (see Appendices B & C). Finally, team members offered individual and small group assistance on a continuous on-site basis to providers on the management of elderly patients with type 2 diabetes.

Learning and Growth

A number of programs were established by the interdisciplinary diabetes team to enhance the learning and growth of the providers related to the care of elderly patients with type 2 diabetes. Providers at the intervention site participated in a didactic presentation describing the status of care for elderly patients with type 2 diabetes (see Appendix D). Data were presented from the patient database (chart audit) (see Appendix E). The data focused on lab results, frequency of testing, and resource utilization. The current status of patient care at the intervention site was compared to the national guidelines. The data, presented to the providers, indicated that the providers were not meeting the guidelines consistently resulting in patients with less than optimal clinical outcomes. The providers from the intervention site then discussed ways to improve the management of patients with diabetes. Strategies included additional didactic programs, a diabetes flow sheet for the chart (see Appendix F), a resource directory (see Appendix C), working with interdisciplinary diabetes teams, and feedback. Additional didactic training sessions for the providers focused on the use of the diabetes flow sheet, the resource directory, psychosocial and clinical management of patients with type 2 diabetes. A

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quarterly newsletter was implemented in order to keep the providers informed of changes in the care of patients with diabetes (see Appendix G).

Business Perspective

As a result of the information collected on the patients and the feedback from the first didactic session with the providers at the intervention site, changes were made in the systems of operation at the setting by the interdisciplinary diabetes team. The systematic changes included the development and implementation of a diabetes flow sheet for the patient charts and a resource directory (Appendices C & F). The flow sheet listed the tests and examinations that should occur with a patient with type 2 diabetes over the course of a year. This was used to make the providers aware of the standard protocols for managing diabetes. The sheet was formatted so that the test results for an entire year could be documented. If properly used, the providers could readily determine if a test was missing or abnormal from the flow sheet.

The resource directory was a computerized program purchased from the Tidewater Planning Council by the interdisciplinary diabetes team (Appendix C). The directory included a list of all of the resource programs in the Tidewater region of Virginia. The directory could be used to look up resources by category. It included the location, a phone number, a description of the resource, and a contact person. This information could be printed out by the providers for the use by the patients. The program was located on a computer in medical records so the providers could have easy access to it.

Patient/Client

Diabetes is a disease that requires behavioral changes along with clinical interventions in order to minimize the complications associated with diabetes. In order to be successful

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in making behavioral changes, patients must have the knowledge, skills, and resources needed to comply with the healthcare recommendations. In order to provide the patient with knowledge and skills, a four session program was developed and implemented by the interdisciplinary diabetes team. The nurse practitioner and the registered dietitian, who are both certified diabetes educators, had primary responsibility for developing, implementing, and evaluating the sessions. The patient sessions occurred for four consecutive weeks beginning January 2000. Each session occurred for two hours one time each week. Six to twelve patients attended each session. Twenty percent of the patients from the intervention group participated. The patients consisted of both men and women seen as patients at the intervention site for type 2 diabetes. Patients with learning disabilities, dementia, or Alzheimer's Disease were excluded from the program. The patients were encouraged to bring other family members to the sessions. These sessions were used to improve clinical, biopsychosocial, behavioral, and quality of life issues with patients with type 2 diabetes.

During the first session, the patients had an opportunity to meet the team and the other patients. The patients shared some of their experiences and frustrations with having diabetes. The two diabetes educators discussed the format, goals, and expectations of the program. The discussion focused on the impact of diabetes in their lives and a 24-hour food intake and activity log. Height, weight, and blood pressure were obtained on all patients. The family physician and nurse practitioner reviewed each patient's chart using the diabetes flow sheet (see Appendix F) prior to the session in order to determine what laboratory data and clinical assessment were needed. Data on anxiety were collected with the State-Trait Anxiety Scale; on depression with Beck's Depression Inventory (primary

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care version); and on stress levels with a visual analog stress scale (see Appendix H). All of these instruments are well tested and validated scales for use with patients with diabetes. After the first session, the database manager entered the data on the patients into the database. The family physician, the two diabetes educators, and the psychologist reviewed the data and developed handouts for the patients containing the patient's own results. The results of the data obtained were provided to the patients at the following three sessions as they applied to the topic. As indicated by the data obtained on each patient, the patients were given pertinent referrals by the family physician.

During the second session, the patients met as a group with the nurse practitioner/diabetes educator and the family physician in order to discuss the clinical aspects of their care. The patients were given copies of laboratory and clinical data. Patients were also be given copies of materials from the Diabetes Institute to reinforce concepts and a laminated diabetes tracking card to help them keep track of the timing of various examinations they needed (see Appendix I). A pocket guide and a owner's manual were provided to each patient and reviewed. The patients learned about desired lab values, frequency of lab tests, and frequency of clinical examinations based on current American Diabetes Association (ADA) guidelines. Patients learned how to examine and care for their feet. The patients were given insight on how to use the laminated card to obtain data from their clinical providers and how to keep the card current. The patients compared their recent lab results with desired results. Strategies for improving their laboratory and clinical findings were provided. Finally, patients learned how to be their own advocates and how to partner with their primary care provider proactively to achieve optimal healthcare.

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During the third session, the patients met with the nutritionist/diabetes educator to discuss some of the behavioral changes important in optimizing their health. The focus was on their diet history, dietary changes needed, motivation, goal setting, and basic lifestyle modification. Topics included making healthy food choices, participating in regular physical activity, routine foot care, and monitoring of blood glucose levels. The results of the diet and activity log were presented to the patients. Participants were guided through exercises designed to identify motivational factors in their lives. Once individual motivators were identified, the patients were taught how to build on the motivators to set realistic, measurable behavioral goals that support healthy outcomes. Behavioral contracting was used to assist patients in concretely identifying their goals and measures to achieve them. Additionally, an overview of healthy food choices were provided based on flexible meal planning and carbohydrate counting. Patients were guided through planning a day's food intake designed to meet individual needs. Patients received instruction regarding the relationship between aerobic exercise, weight management, blood sugar control, and lowering the risk for cardiovascular disease. This session provided opportunities for patients to use their home glucose monitors to assure consistently accurate readings. The patients were given pamphlets and data sheets to assist them with accomplishing the needed dietary changes. In performing these activities as a group, the opportunity to elicit peer and health professional support was provided.

During the fourth session, the patients met with the two diabetes educators and the psychologist to discuss psychosocial and quality of life issues. The patients were given the results from the State-Trait Anxiety Scale, the stress scale, and Beck's Depression Inventory (see Appendix H). Several research studies have shown that chronic

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psychosocial stress is associated with significantly worse glycemic control in patients with type 2 diabetes, and that effective coping can protect individuals from the deleterious effects of stress (Peragallo-Dittko, Godley & Meyer, 1995). The psychologist provided the patients with effective methods of coping with stress including cognitive restructuring, time management, and assertiveness. A brief stress reduction exercise was taught and patients received an audiotape with a 15-minute stress reduction exercise and a workbook for home use. Those participants who showed high stress or stress vulnerability were referred to a six-week stress management training program offered within the department. Psychiatric referrals were expedited if necessary. The diabetes educators taught the patients about community resources available to help them maximize quality of life and how to access resources. The patients were provided with a community service directory and taught how to use it.

Patients were recruited for the program with flyers that were placed in the waiting room and the patient care rooms at the intervention site. Providers were informed by the diabetes educators and the family physician about the program and encouraged to refer patients to the programs. The departments database manager used the current database to identify patients with a HbA1c of 8.0% or above. These patients were contacted by phone and invited to join the program. Under supervision of the researcher, the research assistant was responsible for calling and scheduling all patients who were referred or contacted the office regarding the program.

Financial

Cost is always a factor in the implementation of a successful program in a clinical practice. Therefore, the interdisciplinary diabetes team made every effort to incorporate

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the programs they implemented into the daily activities at the intervention site. Didactic sessions were offered during the established daily noon conferences. The flow sheets and resource directory were made available in the clinical settings. Finally, the patient education meetings were offered during regular clinical hours.

Description of Study

Three groups of subjects are considered in this study and examined for changes over time. These include the interdisciplinary diabetes team, providers, and their patients with type 2 diabetes mellitus. These three groups will be discussed separately.

Interdisciplinary Diabetes Team

Interdisciplinary Team Data Set. The interdisciplinary diabetes team consisted of a family practice physician, a nurse practitioner/diabetes educator, a psychologist, a nutritionist/diabetes educator, a chaplain, a nurse practitioner/researcher, and an administrative assistant. The diabetes team members were responsible for developing and implementing the intervention. The team members consisted of two men and five women. Ages ranged from 30-63 years of age. All of the members have been with the DFCM for at least six months.

Method for Study of Teams. The interdisciplinary diabetes team was assessed through both qualitative and quantitative approaches. Specifically, data were collected through interviews of team members, observation of the interdisciplinary diabetes team during meetings, and feedback from the providers at the intervention site. The team members were interviewed and observed by the researcher regarding the performance of the team. The researcher conducted the interview using a researcher-developed survey form (Appendix J). The researcher filled out the survey based on the responses of the

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team members. The interview that was conducted in the office of each team member took approximately 30 minutes to complete.

The team process was assessed by the research assistant who observed and recorded activity on the Teamwork Scale (Appendix K). The observations occurred one time every two months, for a total of six observations, to determine how the team activities changed over time. The team observation began in June 1999 when the team was assembled and continued through June 2000 when the post-test data collection began. This time period was consistent with the academic year for the residents.

Information was also gathered from the providers at the study site, since they were participating in the programs developed by the interdisciplinary team. Data were collected on their perception of the diabetes programs. Data were collected at the end of the program using a researcher-developed questionnaire (see Appendix L).

Teamwork Scale. Teamwork was assessed with the Teamwork Scale developed and tested by Rosenstein (1994) and based on Dickinson and McIntyre's Model of Teamwork (see Appendix K). This instrument assesses teamwork based on the concepts of team orientation, team leadership, communication, monitoring, feedback, backup behavior, and coordination. The tool is completed by the researcher as the team is observed in action. The instrument was developed and tested by Rosenstein with both confirmatory and exploratory factor analysis.

The researcher and a research assistant completed the Teamwork Scale while observing the interdisciplinary team. In order to determine interrater reliability, the research assistant and the researcher completed the Teamwork Scale while observing two teams that were not used in the study. Prior to observing the teams, the researcher

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reviewed the questionnaire with the research assistant, discussing how the instrument was scored and how various items should be interpreted. The researcher and research assistant then observed a team in action and compared the result of the observations. They discussed any discrepancies in the scoring of the teams and came to agreement on how the items should be scored. Another team was observed and the agreement of the scoring was assessed. The goal was to achieve 80% agreement. Agreement was defined as the scores of the researcher and the research assistant being within one point on 80% of the items on each of the subscales. There was 90% agreement achieved both of the times the research assistant and researcher completed the questionnaire. Therefore, inter-rater reliability was established. Only the research assistant scored the interdisciplinary team.

Researcher-Developed Team Survey. Two researcher-developed surveys were used to determine how the team members and the providers perceived the intervention. The survey for the team members (see Appendix J) consisted of open-ended questions about the roles of the team member, the team's successes and failures, evaluation of the specific programs, and recommendations. The researcher asked the team members each question on the survey and recorded their responses on the sheet. The researcher-developed survey for the providers (see Appendix L) addresses the benefits and barriers to each program as perceived by the providers.

Family Practice Physicians

Provider Data Set. The providers in the study included all of the physicians and residents at intervention site and the comparison site. None of the physicians or residents were excluded. In the intervention site, there were 13 faculty physicians and 18 residents. Although all of the residents at the intervention site (100%) participated in the study, one

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faculty physician refused to participate (17/18, RR=94.4%). At the comparison site, there were 12 faculty physicians and 18 residents. All of the physicians and residents participated at the comparison site. The physicians at both sites had worked as faculty in the DFCM for at least one year and all had an established panel of patients. The residents consisted of first, second, and third-year residents. They also had a panel of family practice patients at either the interventions site or the comparison site. The study was conducted over one academic year in order to focus on a consistent group of residents.

Demographic data on the providers are presented in Table 1. The average age of the providers at the intervention site is 38.15 (sd=10.88) and the comparison site is 39.00 (sd=8.60). A slight majority (59.5 and 60.0%) of the providers at both sites were female.

Table 1

Demographic Data for Providers in the Study by Site

Demographic	Intervention Site Physicians		Comparison Site Physicians	
	N	%	N	%
Age				
20-30	9	33.3	4	23.7
31-40	9	33.3	5	34.4
41-50	6	22.3	6	46.2
51-60	1	3.7	2	11.8
Over 61	2	7.4	0	0.0
Gender				
Male	17	40.5	10	40.0
Female	25	59.5	15	60.0
Type Provider				
1st year resident	13	31.0	8	32.0
2nd year resident	13	31.0	2	8.0
3rd year resident	8	19.0	10	40.0
Faculty	8	19.0	5	20.0

In addition to assessing individual physicians and residents, four teams composed of the providers at each residency site were assessed before and after the intervention to

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determine team effectiveness. The two sites had various teams in place with members consisting of physicians, residents, nurse practitioners, social workers, and nurses. All of the personnel at each site participated in team activities. The teams had been assembled prior to the study to focus on administrative issues related to the department, the clinical sites, residency training, and grant implementation. The teams consisted of five to fifteen participants from the varying disciplines in the department.

Method for Provider Survey. A quasi-experimental design was used when assessing the providers. There were two groups: the intervention/experimental group consisted of physicians and residents who were receiving the intervention and the comparison group consisted of physicians and residents from the site that did not receive the intervention. The physicians completed two consent forms and an initial questionnaire packet (see Appendix M). After the intervention, a revised packet was completed. The investigator explained the study to the physicians during a departmental meeting and requested participation in the study. The departmental meeting is a meeting where all of the providers in the DFCM come together to discuss departmental and schoolwide issues. The meeting is usually led by the Chairman of the DFCM. During the meeting, the questionnaire packet was handed out to the physicians and residents. The providers were asked to sign the consent forms and complete the questionnaires at their leisure within two weeks. Completed questionnaires were placed in a sealed envelope and put in a labeled box in the mailroom. Data were collected for the pretest in July and August 1999 and for the post-test in June and July 2000.

In addition, the providers at the study site were observed as a group during clinical and residency meetings in order to assess their team-oriented behaviors. The providers at each

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site were observed in four meetings before the implementation of the diabetes intervention programs and four meetings after the program had been implemented. The researcher and the research assistant observed the DFCM teams using the Teamwork Scale developed by Rosenstein (1994) and scored the team behaviors (Appendix K). The score from the research assistant and the researcher were averaged for the four meetings prior to the implementation of the program and for the four meetings after the intervention.

Provider Instruments. Data were collected on the providers through a provider completed questionnaire packet, and a chart audit. The provider completed questionnaire packet included a researcher-developed provider instrument, the Geriatric Attitudes Scale, and the Interdisciplinary Collaboration Scale (ICS) (see Appendix M). In addition, during the post-test data collection, the providers at the intervention site completed a researcher-developed questionnaire assessing the programs that were implemented as part of the intervention (see Appendix L). Finally, the Teamwork Scale was used to assess how the providers functioned on teams (see Appendix K).

The researcher-developed provider instrument was used to assess attitudes towards teams, team utilization, referral patterns, resource utilization, their perspective of the programs, and use of the diabetes flow sheet. The researcher-developed provider questionnaire was tested for face and content validity by a family physician, a psychologist, a nurse practitioner/diabetes educator, a health researcher, an organizational psychologist, and the director of a nursing school. Changes were made based on input from these individuals (see Appendix N).

The Geriatric Attitude Scale is a 14-item Likert scale (1=strongly disagree, 5=strongly agree) developed and tested to measure attitudes towards the elderly (Reuben, Lee, Davis,

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Eslami, Osterweil, Melchiore & Weintraub, 1998). The Geriatrics Attitudes Scale has been shown to be internally consistent (Cronbach's alpha .76). The responses on the instrument have been correlated with the Maxwell-Sullivan scale ($p<.001$).

The Interdisciplinary Collaboration Scale (ICS) is a 25-item questionnaire which assesses the participant's views of other disciplines on a 6-point Likert scale (1=strongly agree, 6=strongly disagree). The ICS has four open-ended questions related to interdisciplinary collaboration. The tool was developed by the researcher and has been pilot-tested and tested for face and content validity.

The Teamwork Scale used with the providers was the same questionnaire used to assess the interdisciplinary diabetes team. Details of this survey are discussed above under "Teamwork Scale."

Patients

Patient Data Set. The target population and sampling frame consisted of patients, age 55 and above with type 2 diabetes. These patients had been patients seen by providers in the DFCM for at least one year. The patients were divided into a study group (intervention site patients) and a comparison group (comparison site patients) based on the site of care. Patients with certain physical (nonambulatory) or mental handicaps (dementia or Alzheimer's disease) were excluded from the study. Patients who were living in a nursing home were also not included in the study. Stratified random sampling with SPSS was used to select one hundred and two patients from the approximately 350 patients at each site. Data were collected on these 204 patients for this study. In order to be considered a continuity patient, the patient had to have been seen by the same resident or faculty physician for at least three visits over the previous year. At the intervention site,

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51 of the patients selected were continuity patients of the faculty physicians and 51 of the patients were continuity patients of the residents. At the comparison site, 52 of the patients were continuity patients of the residents and 50 were continuity patients of the faculty physicians.

During the first phase of the study, a chart audit was conducted on the patients. Once the chart audit was completed, these patients were contacted by phone and asked to participate in a phone survey in order to assess quality of life and health behaviors. Table 2 describes the participation in each phase of the study. From the 102 patients at the intervention site whose charts were audited, 74 participated in the phone survey. Thirty-five patients were continuity patients of the residents and 39 were continuity patients of physicians. From the 102 patients at the comparison site assessed through the chart audit, 70 participated in the phone survey. Thirty-five of these patients were patients of the residents and 35 were patients of faculty. Forty-nine from the intervention site and 61 from the control site participated in the phone survey after the intervention. Many of these patients had moved or changed their phone numbers making it difficult to contact them by phone. There were no significant differences between those who remained in the study and those who dropped out in regards to age, gender, length of illness, number of hospitalizations, or type provider.

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Table 2

Patient Participation in the Study by Site

Patient Participation	Intervention Site N	%	Comparison Site N	%
Total w/Diabetes	357	100%	342	100%
# in Chart Audit	102	28.6 %	102	29.8%
# 1st Interview	74	72.5%	70	20.5%
-Residents*	35	47.3%	35	50.0%
-Faculty*	39	52.7%	35	50.0%
Response Rate**	RR=72.5		RR=68.6	
# 2nd Interview	49	48.0%	61	59.8%
-Residents*	26	53.0%	32	52.5%
-Faculty*	23	47.0%	29	47.5%
Response Rate**	RR=48.0		RR= 59.8	

*The percentage is based on the percent of the total amount of those who participated in the interview that were either faculty or residents.

**The response rate is based on percent of those who participated in chart audit and participated in the interview when they were called.

Demographic data on the patients are presented in Table 3. The average age of the patients at the intervention site was 65.31 (sd=7.38) and at the comparison site was 66.87 (sd=8.14). The average length of illness at the intervention site was 9.6 years (sd=8.78) and 10.76 (sd=9.05) at the comparison site. Most of the patients lived with another person and thus had someone to care for them as needed. There were about twice as many females as males at both sites. Almost half of the patients at each site were married.

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There were no significant differences between the two sites on the demographic variables as tested with Mann-Whitney U and Chi Square statistics.

Table 3

Demographic Data for Patients in the Study by Site

Demographic	Intervention Site Patients		Comparison Site Patients	
	N	%	N	%
Age				
55-65	51	53.7	52	50.0
66-75	37	38.9	38	36.5
76-85	5	5.3	13	12.5
Over 85	2	2.1	1	1.0
Gender				
Male	31	33.7	29	29.9
Female	61	66.3	68	70.1
Marital Status				
Single	12	18.2	1	1.4
Married	29	43.9	37	53.6
Divorced	10	15.2	12	17.5
Widowed	15	22.7	19	27.5
Length of Illness				
≤3 years	21	30.9	16	23.5
5-7 years	19	27.9	15	22.1
8-11 years	8	11.8	14	20.6
≥12 years	20	29.4	23	33.8
Living Arrangement				
Alone	14	20.9	14	20.9
With Someone	53	79.1	53	79.1
Has Informal Caretaker				
Yes	66	93.0	58	84.1
No	5	7.0	11	15.9
Hospitalized this Year				
Yes	19	26.8	27	39.1
No	52	73.2	42	60.9
Mode of Travel				
Own Car	42	64.6	41	59.4
Other's Car	15	23.1	18	26.1
Bus	5	7.7	1	1.4
Handicab	2	3.1	1	1.4
Taxi	1	1.5	2	2.9
Other	0	0.0	6	8.8

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Method for Study of Patients. A quasi-experimental design, specifically a pretest-posttest comparison group design, was used with the sample of patients with type 2 diabetes. With a pretest-posttest comparison group design, there is a comparison group and an intervention group. Although both groups take the pretest and the posttest, only the intervention group receives the intervention between the pretest and the posttest. The patients in this study were divided into two groups based on site of care, resulting in nonrandom assignment of individual patients. The patient billing database at each site was used to identify patients for the study.

A chart audit was conducted on 102 patients from each site. Data from the chart audits were entered onto a researcher-developed questionnaire (see Appendix E). The chart audit provided data about the patient as well as their eligibility for the study. Patient eligibility was based on whether the patient had diabetes treated at the site for at least one year; whether the patients were able to respond to the questions; whether the patient was over age 55; and whether the patient was a continuity patient of a provider.

The patients whose charts were reviewed for the chart audit and who met the inclusionary criteria (99% of those in chart audit) were called by the investigator or the research assistant to participate in an interview. A questionnaire packet was used by the investigator and research assistant to conduct the interview (see Appendix O). The packet included a script that was used to explain the study to the patients and the questionnaires for the interview. The script was read to the patients and then the patients were asked to participate in the study. The patients received an explanation of the risks and benefits to the study as well as a description of the process used to conduct the interview (see Appendix O). The researcher or research assistant asked the patients who agreed to

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participate in the study the questions in the packet. The questions consisted of a researcher-developed questionnaire to assess management of diabetes; the SF-36 to assess quality of life issues; and the Smith-Falvo Doctor-Patient Interaction Scale to assess satisfaction with their physician. The researcher and research assistant followed a script that had been specified for the data collection and filled out the questionnaires as the patients answered the questions. Once the interview was completed, the researcher or research assistant thanked the patient for participating. The patients were told that they would be called again in eight to twelve months in order to update the information. Once the data were collected, the questionnaires were placed in a secured file cabinet in the research assistant's office. The interview took between 15 and 20 minutes to complete. The data were collected between June 1999 and August 1999. The chart audit and patient interview was administered a second time after the program had been implemented with the same process with a revised researcher-developed questionnaire (see Appendix P). Data were collected from August through October 2000.

Patient-focused Instruments. Data were collected on the geriatric patients with type 2 diabetes through a chart audit and a phone survey using two researcher-developed instruments, the SF-36, and the Smith-Falvo Doctor-Patient Interaction Scale (Appendices E, O & P).

Two researcher-developed instruments were used to assess patient demographic information and healthcare status. The first instrument was used to collect pre-test and post-test data from a chart audit (see Appendix E). This information was used to determine the patient's eligibility to participate in the study and changes over the course of the study. The researcher-developed instrument assessed age, gender, length of diagnosis,

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marital status, healthcare needs, health status variables such as HbA1c and hospitalization, the use of community resources, laboratory findings, and other medical complications. The second researcher-developed instrument was used to gather pre- and post-test data during a phone survey (see Appendices O & P). This instrument addressed healthcare needs such as social support, demographic data, and the use of and familiarity with community resources. The researcher-developed instruments have been tested for face and content validity by a panel of providers consisting of a family physician, a nurse practitioner/diabetes educator, and a clinical psychologist in the DFCM. The instruments were also reviewed for face and content validity by a health researcher, an organizational psychologist, and the director of a nursing school. The instruments were further pre-tested by the researcher prior to the implementation of the study. The researcher-developed instrument for the chart audit was used to review five charts of diabetic patients over the age of 55. While collecting the data, the researcher noted any confusion related to the items or any difficulty in obtaining information from the chart. The researcher made adjustments to the questionnaire as needed (see Appendix Q).

The researcher-developed instrument used for the phone survey was assessed during the training with the research assistant. The researcher trained the research assistant to collect data through a phone survey using the script and the questionnaires (see Appendix O). The researcher applied the protocol developed for the interview and described in the script. This occurred in several steps. First, the researcher reviewed the script and questionnaires with the research assistant. Once the data collection process was acceptable, the research assistant pilot tested the approach through phone surveys with ten patients in the practice who did not participate in the study. The researcher then gave the

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research assistant feedback and responded to any question the research assistant had. The researcher devised approaches for handling interviews that did not go smoothly. These included having the researcher listen to the patient when they got off focus then steering them back to the questions on the questionnaire; having the patient contact their providers for medical advise; and scheduling a time for the interview if the first call was not at a convenient time. Any question in the researcher-developed instrument that was not clear and easily understood by the patient was modified (see Appendix Q). Once the researcher and the research assistant felt comfortable with the phone surveys, patients were called to participate in the study. This process began in June 1999.

The SF-36 is a 36-item standardized instrument used to assess health status from the patient's perspective. The instrument measures the nine health constructs of health including: bodily pain; physical functioning; role-physical; general health; vitality; social functioning; role emotional; mental health; and health transition (Ware, 1997). Higher raw scores indicate better health status and can be utilized when samples are similar. The SF-36 has been tested for reliability and validity in a number of studies. It has achieved reliability estimates of .76 and above (range .76-.93) in all eight subcategories in studies of patients with diabetes (Ware, 1997). Reliability scores have ranged from .77 to .92 in studies with patients 65 years of age and older (Ware, 1997). Validity has been established through criterion-based validity studies and factor analysis (Ware, 1997).

The Smith-Falvo Doctor-Patient Interaction Scale is a standardized instrument consisting of 19 items with five responses ranging from strongly agree to strongly disagree. The instrument assesses the patient's satisfaction with the healthcare provider. Test-retest reliability was found to be .76 and internal consistency reliability with

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Cronbach's Alpha was .85 (Falvo & Smith, 1983). In a study by Bowman & colleagues (1992), criterion based validity was evaluated ($p<.01$) and Cronbach's alpha was .80.

Protection of Human Subjects

The proposal received approval from the Institutional Review Boards at Eastern Virginia Medical School and Old Dominion University (see Appendix R). All of the questionnaires were coded with numbers that corresponded with a list of names kept in a notebook in a locked cabinet separate from the questionnaires. This was necessary to track these data in order to correlate the data prior to the implementation of the diabetes intervention program with the data collected after the program. Only the researcher had access to the notebook. All of the participants were assured that confidentiality would be maintained.

There were no known risks to the patients, providers, or team members in this study. The providers may have benefited from learning skills for working in teams as well as in caring for elderly patients with diabetes. The patients may have benefited from receiving more focused care for their diabetes as well as the social support offered through the phone survey. Two consent forms were included with the provider questionnaires (see Appendix M). The patients were read a cover letter over the phone that explained the risk and benefits of the phone survey (see Appendix O). The patients were then asked if they would be willing to participate in the study.

Research Plan

Based on the theoretical model, the research instruments, and the research questions, Appendix S outlines the plan for the study. Appendix T outlines the variables assessed in the study.

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Analyses

Statistical Package Social Science (SPSS) Version 7.5 (1997) was used to carry out all descriptive, bivariate, and multivariate analyses for this study. Demographic data are presented on patients with type 2 diabetes, healthcare providers, and members of the interdisciplinary diabetes team. Descriptive, bivariate, and multivariate analyses are presented on the study variables as they relate to the patients, the providers, and the team performance. Descriptive statistics consist of mean, percentages, and summary scores. Bivariate statistics include the Mann-Whitney U, the Wilcoxon Signed Rank test, the McNemar test, and the Chi-Square contigency table. Multivariate analyses include multiple linear regression and ANCOVA. Descriptive data as well as qualitative data are presented for the evaluation of the intervention process. The following section describes the specific analyses for the evaluation of the interdisciplinary diabetes team, the providers, and the patients. The results of the analyses will be discussed in Chapter IV.

Interdisciplinary Team/Intervention Outcomes

Quantitative and qualitative analyses were conducted to determine the performance of the interdisciplinary diabetes team. The interdisciplinary diabetes team was expected to perform as indicated through the Enhanced Primary Care Model (see Figure 4). Therefore, the research questions examine the components of the interdisciplinary team, the team's ability to perform well as a team, the effectiveness of the team in developing and utilizing a database, implementing behavioral changes, and implementing clinical guidelines. Data were collected through a researcher-developed provider survey (see Appendix L), observation of the team (see Appendix K), and an interview of the team members (see Appendix J).

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Qualitative data on team performance were collected through observation and interviewing. The researcher functioned as a participant observer on the interdisciplinary diabetes team. In this role, she provided the team with information from the database as well as observed the teams performance. The researcher observed the interdisciplinary diabetes team during each weekly team meeting throughout the study period. Data were collected through the techniques of field notes. As the team met, the researcher took notes on what occurred during the meetings along with direct quotes. She also took notes based on her observations. Data were then collected by interviewing or questioning the team members and the providers at the intervention site. The focus was on their perception of the interdisciplinary diabetes team's performance and the programs the team developed. The researcher realized that she had a bias toward successful team performance. Therefore, it was important to keep opinions to herself regarding team performance. Once the data were collected, the researcher reviewed the data and grouped it into response categories. There are 15 research questions addressing the team performance. Details of the qualitative and quantitative approaches used in this study will be described as each of the research questions on team performance is discussed.

Research questions on components of interdisciplinary diabetes team. There were two research questions addressing the components of the interdisciplinary team. The first research question was, " *what disciplines make up the interdisciplinary team?*" and the second research question was, "*what are the roles of the various disciplines on the interdisciplinary team?*" These data were collected through observation of the team with jotting and field notes. In addition, the team members were interviewed regarding the roles of team members. They were questioned about their perception of various team

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member's roles and how the various team members contributed to or hampered team performance (see Appendix J). Notes were taken and then organized into categories.

Research questions on team behavior. These questions were addressed as described by the Teamwork Scale while observing the interdisciplinary team in action (see Appendix K) followed by an interview with each team member. Four research questions were used to address team behavior. The questions included: "*what teamwork behaviors do the interdisciplinary team members perform well as measured by the teamwork scale?*," "*what teamwork behaviors do the interdisciplinary team members perform poorly as measured by the teamwork scale?*," "*do teamwork behaviors improve over time among the interdisciplinary team members as measured by the teamwork scale?*," and "*from the perspective of the team members, why do they believe trends in team performance occurred?*" Descriptive statistics, primarily the mean scores, were used to assess these questions. Then, bar and line graphs were developed. The information obtained from the interview was then compiled to explain what the team members perceived was the explanation for the trends illustrated on the line graphs.

Research questions on developing and utilizing a database. Three research questions were used to address the use of a database by the team. These included: "*what data does the interdisciplinary team collect in order to train providers?*," "*how does the interdisciplinary team collect the data for the training programs?*" and "*how does the interdisciplinary team use the data in providing training to the providers?*" The team members were interviewed regarding the team's participation in collecting and utilizing data for the training. The team was also observed during their weekly meetings as the

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team members made plans for utilizing the data and followed-up on how their plan went. Field notes were taken by the researcher and compiled into categories.

Research question on developing behavioral skills. One research question was used to address behavioral skills. This research question was, "*what types of programs are developed to train providers in behavioral skills?*" This research question was addressed with qualitative analysis. The team members were interviewed regarding the programs used to develop behavioral skills. The team was also observed by the researcher during each weekly team meeting and notes compiled on the development of programs to improve the behavioral skills of providers.

Research question on clinical guidelines. One research question was used to address clinical guidelines. This research question was, "*what types of programs are developed to train providers to use clinical guidelines?*" The team members were interviewed in order to collect data for this research question. The team was also observed by the researcher and field notes were taken.

Research question on success of team. Four research questions addressed the success of the team. These research questions included: "*what are the benefits to each program?,*" "*what are barriers to each program?,*" "*do the interdisciplinary team members feel the team was a success?,*" and "*what could improve the programs implemented by the interdisciplinary team?*" The providers in the study site and the team members were questioned regarding the performance of the team in order to address these questions. The team was also observed during the team meetings by the researcher and field notes were taken. Descriptive data were presented on the benefits of the program.

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Family Practice Physicians/Providers

Analyses were conducted to examine changes in provider behavior and attitude within the two sites and between the two sites. The study focused on the providers' attitudes towards the elderly, towards working with other disciplines, and their referrals to resources and consultants. In addition, hypotheses about providers addressed compliance with clinical interventions, documentation of behavioral interventions, and functioning in interdisciplinary teams. There were eight hypotheses regarding comparisons between the study and comparison group and six hypotheses focusing on pre-test/post-test results at each site. The analyses will be discussed as they apply to each hypothesis.

Hypotheses on physician attitudes towards the elderly. There were three hypotheses about the physicians' attitudes towards the elderly. The first hypothesis is that "*the study group physicians will have more positive attitudes towards elderly patients than the comparison group physicians after the intervention program.*" In order to determine if study group physicians had a more positive view towards the elderly than the comparison group physicians, a Mann-Whitney U test was utilized. The Mann-Whitney U test was conducted on the data between the two sites before the program started to determine if the groups were equivalent at onset and again after the program was completed on their attitude towards the elderly.

The second hypothesis is that "*the study group physicians will have more positive attitudes towards elderly patients (as measured by the Geriatric Attitude Scale-GAS) after the intervention program than before.*" In order to determine whether there was a significant change in the attitude of physicians before and after the program, within each group, the Wilcoxon Signed Ranks test was performed.

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The third hypothesis was that, "*the physicians will have a more positive attitude towards elderly patients after the intervention program controlling for pretest scores regardless of the gender of the provider, the type provider, or the practice site.*" Three ANCOVAs were run. In all three ANCOVAs, posttest scores on GAS served as the dependent variable. With the first ANCOVA, the difference between the men and women providers on this variable was examined after controlling for pretest GAS scores. A second ANCOVA was run examining the difference between provider type on posttest GAS scores. Provider type was identified as either faculty or residents. The third ANCOVA was run examining differences between practice site on posttest GAS scores. Three ANCOVAs were run because the sample size was too small to include all three independent variables (sex, provider type, and site) in one model.

Hypothesis on interdisciplinary collaboration. There were three hypotheses directed towards the interdisciplinary collaboration of physicians. The Interdisciplinary Collaboration Scale (ICS) was used to assess the attitude physicians had towards working with other disciplines. The disciplines included nurse practitioners, social workers, psychologists, and nutritionists. The first hypothesis was that "*the study group physicians will have a more positive view of working closely with other disciplines than the comparison group physicians after the intervention program.*" In order to determine if study group physicians had a more positive view towards interdisciplinary collaboration, the Mann-Whitney U test was utilized. The Mann-Whitney U test was conducted on the data between the two sites before the program started and again after the program was completed.

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The second hypothesis was that "*the study group physicians will have a more positive view of working closely with other disciplines after the intervention program than before.*" In order to determine whether there was a significant change in the attitude of physicians within each group before and after the intervention, the Wilcoxon Signed Ranks test was performed.

The third hypothesis was that, "*the physicians will have a more positive view of working closely with other disciplines after the intervention program controlling for pretest scores regardless of the gender of the provider, the type provider, or the practice site.*" Three ANCOVAs were conducted for each of the four disciplines. In all of the ANCOVAs, posttest scores on the ICS for each discipline served as the dependent variable. With the first ANCOVA, the difference between the men and women providers on this variable was examined after controlling for pretest ICS scores. A second ANCOVA was run examining the difference between provider type on posttest ICS scores. Provider type was identified as either faculty or residents. The third ANCOVA was run examining differences between practice site on posttest ICS scores. Three ANCOVAs were run because the sample size was too small to include all three independent variables (sex, provider type, and site) in one model.

Hypotheses on referrals. There were two hypotheses that focused on referrals to resources and consultants. A researcher-developed questionnaire was used to assess referral patterns. Referral to resources included referrals to diabetes support groups, nutritional support groups, diabetes education classes, and exercise classes. Referrals to consultants included referrals to nutritionists, diabetes educators, podiatrists, and ophthalmologists. The first hypothesis stated that, "*after the intervention, the study group*

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physicians will refer patients with type 2 diabetes to more resources than the comparison group physicians." This hypothesis was tested with Chi-Square contingency table test.

The second hypothesis stated that "*the study group physicians will refer patients with type 2 diabetes to more resources after the intervention than before.*" The McNemar test was used to test this hypothesis. This test assessed the difference between the level of referrals before the program and after the program.

Hypothesis on compliance with clinical guidelines. There were two hypotheses related to the compliance of the providers with the recommended clinical guidelines. A researcher-developed questionnaire was used to assess provider compliance. Compliance was related to whether or not the providers performed various clinical assessments as frequently as recommended by the American Diabetes Association. These assessments included at least annually checking the patient's HgA1c, feet, eye examination with dilatation, lipid profile, and cardiovascular status. The first hypothesis related to clinical guidelines was "*the study group physicians will be more compliant with clinical guidelines than the comparison group physicians.*" This hypothesis was tested with Chi-Square contingency table.

The second hypothesis stated that "*the study group physicians will be more compliant with the clinical guidelines after the intervention than before.*" This hypothesis was tested with the McNemar test. This test assessed the difference between the scores on provider compliance with clinical guidelines before the program and the scores after the program.

Hypothesis on documentation of behavioral interventions. There were two hypotheses related to the compliance of the providers with the recommended behavioral guidelines. A

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researcher-developed questionnaire was used to assess provider compliance. Compliance was related to whether or not the providers performed various behavioral assessments as frequently as recommended by the American Diabetes Association. These assessments included at least annually checking the patient's diet and monitoring the home glucose. The first hypothesis related to clinical guidelines was "*the study group physicians will more frequently document behavioral interventions than the comparison group physicians.*" This hypothesis was tested with Chi-Square contingency table test.

The second hypothesis stated that, "*the study group physicians will more frequently document behavioral interventions after the program than before the program.*" This hypothesis was tested with the McNemar test. This test assessed the difference between the scores on provider compliance with behavioral guidelines (a set of dichotomous variables) before the program and the scores after the program.

Hypothesis on functioning in interdisciplinary teams. There were two hypotheses addressing the ability of the providers to perform in teams. The Teamwork Scale with its seven categories was used to assess team performance. The seven categories consisted of orientation, leadership, communication, monitoring, feedback, backup, and coordination. The first hypothesis stated that, "*the study group providers will work better in interdisciplinary teams than the comparison group physicians after the intervention.*" In order to determine if the providers performed better in teams according to the seven categories of the Teamwork Scale, the Mann-Whitney U test was utilized. The Mann-Whitney U test was conducted on the data between the two sites before the intervention and then again after the intervention.

The second hypothesis was that, "*the study group providers will work better in*

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interdisciplinary teams after the intervention than before the intervention." In order to assess whether there was a change in the team performance of the providers within each group before and after the intervention, the Wilcoxon Signed Ranks test was performed. The test assessed the difference between the scores in the seven teamwork categories before the program began and then again after the program.

Patient

Analyses were conducted to identify changes in patient outcomes within and between the two sites. The focus was on the patient's satisfaction with the interaction with physicians, quality of life, and clinical outcomes. There were three hypotheses between the intervention and comparison groups and three hypotheses addressing changes within each group. The analysis will be discussed as they relate to each hypothesis.

Hypotheses on patient's satisfaction with the patient-doctor interaction. There were four hypotheses about the patient's satisfaction with their doctor. The first hypothesis stated that, "*the study group patients with type 2 diabetes will be more satisfied with their physicians than the comparison group patients after the intervention.*" Patient satisfaction was measured with the Patient-Doctor Interaction Scale (PDIS) and analyzed with the Mann-Whitney U test. The Mann-Whitney U test was conducted on the data between the two sites before the intervention program was started and then again after the intervention was completed.

The second hypothesis stated that, "*the study group patients with type 2 diabetes will be more satisfied with their physicians after the intervention than before the intervention.*" In order to assess any significant changes between the scores on the PDIS

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before the intervention and after the intervention within each group, the Wilcoxon Signed Ranks test was performed.

The third hypothesis stated that, "*the study group patients with type 2 diabetes will be more satisfied with their physicians than the comparison group patients after the intervention controlling for pretest.*" This hypothesis was tested with the ANCOVA examining the difference between practice site on posttest satisfaction scores after controlling for pretest satisfaction scores.

The fourth hypothesis stated that, "*the study group patients will be more satisfied with their physicians after the intervention when pretest satisfaction scores, gender, and provider type are considered in the model.*" This hypothesis was tested using multiple linear regression with posttest patient satisfaction scores as the dependent variable and pretest satisfaction score, gender, site, and provider type as the independent variables.

Hypotheses on quality of life. There were two hypotheses in this study that focused on the quality of life of the patients as measured by the nine categories in the SF-36. The categories consisted of bodily pain, physical functioning, role-physical, general health, vitality, social functioning, role emotional, mental health, and health transition. Raw scores were utilized for the analyses since the population of elderly patients with type 2 diabetes is relatively homogenous regarding factors related to age and illness (Ware, 1997). The first hypothesis stated that, "*the study group patients will have higher levels of quality of life as measured by the SF-36 than the comparison group patients after the intervention.*" The Mann-Whitney U test was conducted on the data between the two sites before the program started and then again after the intervention was completed in order to address this hypothesis.

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The second hypothesis stated that, "*the study group patients will have higher levels of quality of life as measured by the SF-36 after the intervention than before the intervention.*" In order to assess improvements in quality of life issues as measured by the SF-36 before and after the intervention program, the Wilcoxon Signed Ranks test was performed.

Hypotheses on clinical outcomes. There were three hypotheses in this study that focused on the clinical outcomes of the patients as measured by a researcher-developed questionnaire. Specific focus was on the patient's weight, blood pressure, number of clinical visits, HgA1c level, home glucose, and cholesterol level. The first hypothesis stated that, "*the study group patients will have more improved clinical outcomes than the comparison group patients after the intervention.*" This hypothesis was assessed using the Mann-Whitney U test on the data between the two sites before the program started and then again after the intervention was completed.

The second hypothesis stated that, "*the study group patients will have more improved clinical outcomes after the intervention than before the intervention.*" In order to assess improvements in clinical outcomes before and after the intervention program, the Wilcoxon Signed Ranks Test was performed.

The third hypothesis stated that, "*the study group patients with type 2 diabetes will have a better HgA1c level than the comparison group patients after the intervention controlling for pretest values.*" This hypothesis was tested using the ANCOVA to examine the difference in sites on posttest HgA1c scores controlling for pretest HgA1c scores.

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CHAPTER IV

Results

The purpose of this study was to test the effectiveness of the Enhanced Primary Care Model through an assessment of team formation and patient and provider outcomes. The team utilized in this study developed and implemented programs to improve the healthcare provided to elderly patients with type 2 diabetes. The programs were developed and implemented by an interdisciplinary diabetes team in a family medicine clinical site and results were compared to a comparison family medicine site. Pre-testing was conducted on the providers and the patients with type 2 diabetes at both sites before the intervention programs were initiated. After the programs were completed, posttest data were collected and the performance of the interdisciplinary diabetes team was assessed. Results are presented on the performance of the interdisciplinary diabetes team, provider outcomes, and patient outcomes. Both quantitative and qualitative data are used to assess the intervention programs and thus evaluate the usefulness of the Enhanced Primary Care Model..

Qualitative Assessment of Interdisciplinary DiabetesTeam

Components of interdisciplinary team. The first research question regarding components of the interdisciplinary team was, "*what disciplines make up the interdisciplinary team?*" The interdisciplinary team was initially composed of a family practice physician, a nurse practitioner/ diabetes educator, a chaplain, a psychologist, a nutritionist, and a nurse practitioner/researcher (see Table 4). The team was consistent in membership for the first two months of the program. At that time, the chaplain found that she had limited information to contribute to the meetings so she withdrew from the team.

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After eight months, the psychologist and the nutritionist left the department and as a consequence the team. They were not replaced during the study period. Three months into the program, it was found that administrative/ research support was needed during the meetings. At this time, the database manager with a master's degree in public health joined the team and began attending the meetings.

Table 4

Roles of Members of the Interdisciplinary Diabetes Team

Team Members	**Roles**
Family Practice Physician	-Provided medical information on diabetes to team -Acted as liaison between team and other programs in department -Sought out grant funding for diabetes programs -Presented medical information on diabetes during didactics
Nurse Practitioner/Diabetes Educator	-Provided patient education materials -Developed and presented diabetes education classes to patients -Developed diabetes flow sheet -Wrote grants for diabetes
Nutritionist/Diabetes Educator	-Wrote diabetes newsletter -Presented diabetes education classes for patients on exercise and nutrition
Psychologist	-Presented diabetes education classes for patients on stress management -Presented didactic sessions for providers on stress management of patients with diabetes
Chaplain	-Very little input
Research Nurse Practitioners	-Provided information from database -Presented chart audit data to providers during didactic programs
Database Manager	-Collected data on patients with type 2 diabetes and their providers -Implemented and trained providers in use of resource directory

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The second research question was, " *what are the roles of the various disciplines on the interdisciplinary team?*" By observing the team in action and interviewing the team member, notes were collected on the roles as perceived by the various team members (see Table 4). The role of the family practice physician was to provide the team with medical information regarding diabetes. In addition, the physician was involved in other administrative roles in the department making him aware of various happenings and protocols in the department. With his input, the team learned how to implement the various intervention programs in the department. An example of this was when the team wanted to add a flow sheet to the chart. The physician informed the team that the flow sheet would need to be presented to the practice management committee and receive their approval before it could be placed on the chart. In addition, he was responsible for networking with other faculty and staff in the department regarding team issues. The nurse practitioner/diabetes educator provided expertise on the clinical and educational needs of patients with diabetes. She was responsible for seeking out grant funding, developing a patients education file for the providers, developing and implementing didactic sessions for the physicians, and developing patient education programs. She had the primary responsibility for developing and implementing the flow sheet. The psychologist was instrumental in choosing various surveys for use with patients. He was also instrumental in developing and implementing stress management programs for patients with diabetes as well as educating the physicians on managing the psychosocial needs of patients with diabetes. The nutritionist was primarily responsible for developing and implementing the newsletter and education classes on diet and exercise for the patients and the providers. The chaplain had very little input into the activities of the team and was

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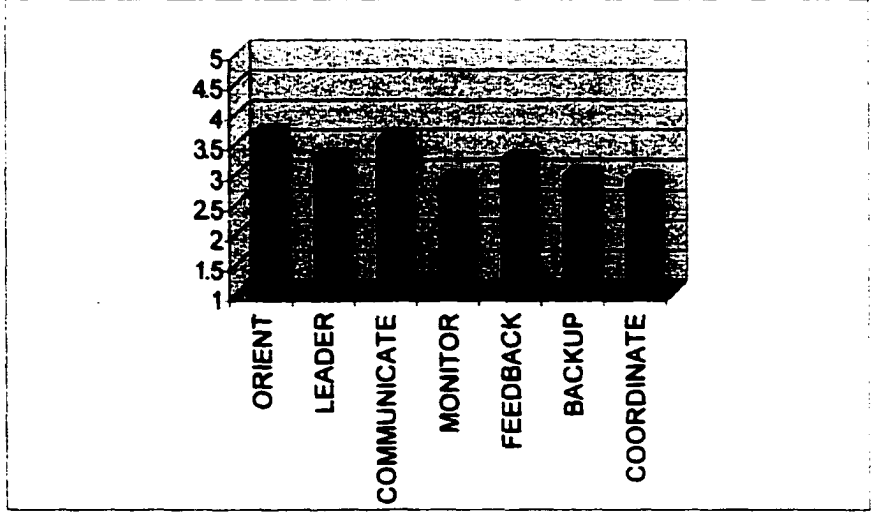
not able to define a role for herself. The nurse practitioner/researcher was responsible for setting up the data collection plan, choosing research instrument, and analyzing the data. The database manager/MPH was primarily responsible for implementing the resource directory and training the providers to use it. She was also responsible for collecting and analyzing data pertaining to the diabetes program.

Team behavior. The first research question regarding team performance was, "*what teamwork behaviors do the interdisciplinary team members perform well as measured by the teamwork scale?*" Descriptive statistics (means=M_x) and bar graphs were used to assess this question (see Table 5). The team performed best in the areas of orientation (M_x=3.66) and communication (M_x =3.53). The higher scores in orientation indicate that the team members have a positive attitude toward each other and the team tasks. The higher score in communication indicate good ability to exchange information and use proper terminology.

Table 5

Average Team Scores



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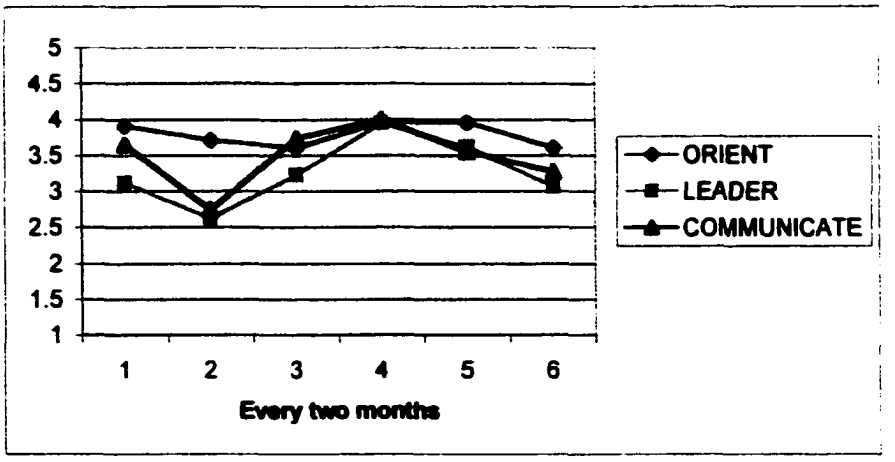
The second research questions was, "*what teamwork behaviors do the interdisciplinary team members perform poorly as measured by the teamwork scale?*" The lowest scores were in the categories of monitoring (M_x=2.89) and coordinating (M_x =2.90) (see Table 5). The lower scores in monitoring indicate that members do not observe activities and the performance of other team members well. The lower scores in coordinating indicate that the team has trouble executing their activities in an integrated manner. The scores were below the mean in these two categories. However, they were not extremely low indicating that in general the team performed fairly well.

The third research question was, "*do teamwork behaviors improve over time among the interdisciplinary team members as measured by the teamwork scale?*" The seven categories on the Teamwork Scale were graphed in a line graph to illustrate team performance during the study (see Table 6). The graphs show that team behaviors in all of the categories except monitoring started off around 3 or higher and improved until the last few months of the study. At the end of the study, the average score was lower than at the beginning for all of the categories except monitoring.

Table 6

Teamwork Over Time



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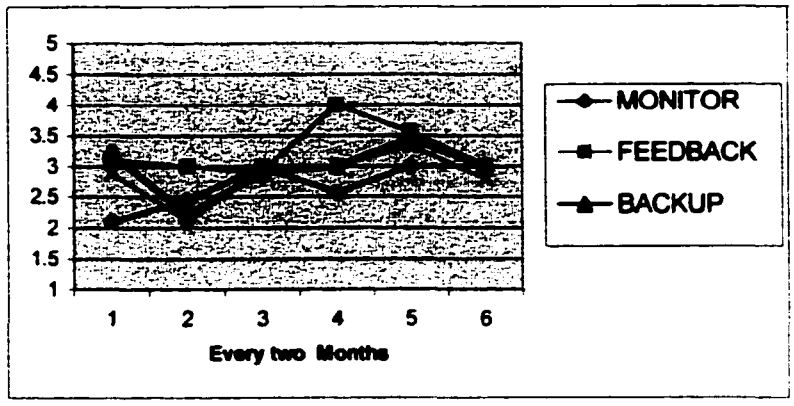

The fourth research question was, "*from the perspective of the team members, why do they believe trends in team behavior occurred?*" According to the team members, based on an interview with the researcher, there were a number of possible reasons for the team behaviors to change during the course of the study. The team members looked at the graphs on teamwork over time (see Table 6) and described what they thought might have caused the graph to appear as it did. First, the team members said that the team behaviors in all of the categories were likely to be high during the third and fourth time period due to the fact that the team was implementing many of the programs during that time and were feeling good about their performance. They felt that the team behaviors began to drop during the fifth and sixth time period due to the fact that many of the programs had been implemented and the team was beginning to get feedback on the success of the programs. The feedback they were receiving was not as positive as they had hoped. Many of the providers were saying that they were not going to change the way they managed patients with diabetes because their current approach worked well for them. In addition, two team members left the department resulting in two less team members. In order to keep the programs going, the remaining team members were going to have to do more work. The loss of the nutritionist had the greatest impact since she had been very instrumental in developing the newsletter and conducting the patient education classes. The team

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members questioned whether the team was worth the effort if providers were going to resist the new programs.

The team members also noted that the monitoring category of the teamwork graph was consistently low throughout the program. One team member expressed that this trend might be due to the fact that the team was composed of people from very different disciplines. The team members tended to trust each other to be responsible for their own areas of expertise. Therefore, it was likely that they would not monitor each other's performance. Another team member expressed that the team members were too busy doing their own tasks to be concerned about what the other team members were doing. Finally, it was expressed that the team members may not know how to monitor each other's performance.

Developing and utilizing the database. The first question regarding the database was, "*what data does the interdisciplinary team collect in order to train providers?*" This question was assessed through observation of team meetings and interviews of team members. The team collected data such as HgA1c levels, frequency of referrals to specialists, frequency of performing various lab tests, and physical examination results. These data were used to develop a training program based on clinical activities.

The second research question was, "*how does the interdisciplinary team collect the data for the training program?*" The data were collected for the training program from an audit of the charts in the practice, a billing database, and phone surveys of patients (Appendices E & O).

The third question was, "*how does the interdisciplinary team use the data in providing training to the providers?*" The interdisciplinary team presented the data from the chart

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audit to the providers at the intervention site. The data were compared to national norms. The providers then discussed ways the results could be improved. Based on input from the providers during the didactic session, intervention programs for improving the care for patients with type 2 diabetes were developed.

Programs for improving behavioral skills. One research question was used to address programs for improving behavioral skills. The question was, "*what types of programs are developed to train providers in behavioral skills?*" Through the observation of the interdisciplinary diabetes team and an interview of the team members, there were six programs identified that were developed to assist the providers in the areas of behavioral skills. The first program was the didactic program where the providers were given information regarding behavioral changes they needed to make regarding referrals, assessing clinical data, and providing patient information. Programs were then developed and implemented to improve the provider's compliance with patient care guidelines. These programs included: a didactic session describing the needs of patients with type 2 diabetes; a newsletter emphasizing behavioral changes needed by providers; a resource directory to improve the referral patterns of the providers; a file of patient education material to assist the provider with patient education; a series of patient education classes; and a flow sheet to improve the documentation by the providers.

Programs for improving clinical skills. One research question was used to assess programs developed to improve clinical skills. This was, "*what types of programs are developed to train providers to use clinical guidelines?*" There were four programs developed to make the providers more aware of clinical guidelines. These programs consisted of: a didactic session that emphasized the ADA guidelines for managing patients

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with diabetes; the newsletter that contained current information on clinical needs of patients with diabetes; a file with patient education material to reinforce the clinical guidelines for the patients with diabetes; and a flow sheet that outlined the clinical guidelines that the provider should adhere to during a clinical visit. These programs were developed by the interdisciplinary diabetes team based on requests from the providers at the intervention site.

Success of the team. Four research questions were used to assess the success of the team. The first question was, "*what are the benefits to each program?*" The benefits of each program were assessed by obtaining information from the team members and the providers. The team members and the providers were asked, "what were the benefits to the (each program was named)?" The programs included: (1) the didactic session, (2) the newsletter, (3) the resource directory, (4) the file of patient education materials, (5) the diabetes flow sheet, and (6) the patient education classes. The responses they gave for each program are listed in Table 7. Both the team members and the providers found each program to be beneficial. Often, the providers found the programs to be more beneficial than the team members realized. Most of the responses emphasized how the programs were perceived to improve awareness and compliance with the best management of patients with diabetes. In addition, many of the programs were perceived to make managing patients with diabetes easier. Sixty-three percent of the providers felt that the didactic sessions improved the way they cared for their patients. Eighty-five percent of the providers used the flow sheet at least some and 54% felt that the flow sheet helped improve the care of patients with diabetes. Ninety-three percent felt the newsletter was useful and 93% felt the patient education materials were helpful.

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Table 7

Perception of Benefits and Barriers to Diabetes Programs as Perceived by the Team Members and the Providers at Intervention Site

Programs	Benefits	Barriers
Didactics for providers -Team Members	-"good introduction to diabetes" -"sessions went well"	-"took a lot of dedication to pull it off" -"hard to keep the momentum going after the session" -"faculty had competing priorities" -"didactics needed follow-up"
-Providers	-"learned better management guidelines for patients with diabetes" -"reemphasized need to monitor patients with diabetes" -"increased awareness of patient needs"	-"conflicts with other activities"
Newsletter -Team Members	-"a good idea" -"increased education of providers" -"well received"	-"took too much manpower"
-Providers	-"provided good, up-to-date information" -"a visible reminder" -"increased awareness"	-"should provide information on resources and education in the newsletter"
Resource Directory -Team Members	-"people who used it, loved it" -"helpful"	-"providers needed more inservice on it" -"needed to buy up-dates every year" -"there are other sources of this information available"
-Providers		-"didn't know it was available" -"I'm not comfortable with using computer" -"needed reminders about it" -"needed computer more accessible" -"took too much time"

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Table 7 (continued)

Programs	Benefits	Barriers
Patient Education Material		
-Team Members	-"went very well" -"used by providers" -"very helpful"	-"needs to be more available" -"not used by everyone"
-Providers	-"helped patient better understand illness" -"helped patient remember what to do" -"reinforced what patient needs to know" -"increased patient's awareness" -"easy access to information"	-"didn't know information existed" -"needed information in folders labeled as basic information and advanced" -"information is not always available"
Flow sheet		
-Team Members	-"great idea" -"should help meet guidelines" -"comprehensive"	-"hard for some people to use" -"not on charts" -"need time to use it" -"not used by all providers"
-Providers	-"saved time" -"good reminder of what to do" -"easy access to information" -"improved documentation" -"easier to assess compliance" -"better continuity" -"ensured optimal care" -"centralized information" -"less falls through the cracks"	-"not aware it existed" -"not on charts" -"not used by all providers" -"not kept up-to-date" -"hard to use with complex patients"
Patient Ed Classes		
-Team Members	-"patients were very satisfied" -"providers request the classes" -"good teachers"	-"took a lot of effort" -"hard to know how to charge patient" -"patients don't value free programs"
-Providers	-"reinforced correct approach to self-care by patient" -"help patient better understand what doctor says" -"patient learns about resources" -"patient more compliant" -"gives patient more time to learn"	-"need more frequently scheduled classes and weekend or evening classes" -"need better compliance by patients on attending" -"need information on classes more readily accessible" -"limited number attended"

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The second research question was, "*what are barriers to each program?*" The barriers to each program were assessed from information received from the providers as well as the team members. They were asked, "what were barriers to using (each program was named)?" The responses they gave are listed in Table 7. Both the team members and the providers had recommendations for improving the programs. Many of their comments emphasized a need to make the programs more accessible. In addition, the team members perceived the programs to require a lot of effort. They also felt that the providers were not as receptive as they should have been. Some of the providers stated that they were not going to change how they managed patients with diabetes because they felt they already did a good job. Finally, the team members and providers felt the programs should have continued longer in order to get optimal results.

The third research question was, "*do the interdisciplinary team members feel the team was a success?*" The team members were interviewed regarding the success of the team. They were asked, "do you feel the team was a success and why or why not?" Responses from the team members are presented in Table 8. All of the team members felt the team functioned successfully. Specifically, they felt that the team members worked well together and contributed significantly to the team's success. They felt that the team meetings functioned very well and that the team environment was very conducive to success. However, they did not feel that the goals related to provider behavior and clinical outcomes were met successfully.

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Table 8

Successes and Ways to Improve Team Performance

Success within Team	Ways to Improve Team Performance
Team Members	**Within Team**
-"worked well together" -"brought differing expertise to team" -"believed in importance of task" -"were willing to contribute and take on tasks" -"willing to put selves out for the team"	-"have a champion" -"make sure providers are kept informed" -"provide more follow-up" -"make sure information is readily accessible" -"provide more protected time for team members to carry out tasks of team"
Team Meetings	**Within Department**
-"were productive" -"stayed on task" -"met regularly each week" -"had a purpose" -"met deadlines"	-"develop a method to monitor provider performance (i.e., using flow sheets, providing patients with education materials, etc)" -"develop consequences for providers who fail to be compliant with programs" -"obtain better support from department leaders"
Team Environment	
-"trusting" -"creative" -"functioned interdisciplinarily" -"respect" -"interest in diabetes" -"open communication"	

The fourth research question was, "*what could improve the programs implemented by the interdisciplinary diabetes team?*" Information was gathered from both the providers and the team members and is presented in Table 8. The team members felt that the team needed someone to take the lead in "championing" the diabetes program. A champion would be able to encourage providers to utilize the intervention programs. A champion would also have the time to address the strengths and weaknesses in the programs. The

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team members felt that they were a little overwhelmed by all of their responsibilities and that they needed time designated to work on the diabetes programs. The providers felt that the programs would be enhanced if they received more reminders regarding the existence of the programs. They felt that all of the providers needed to participate in programs such as entering data on the flow sheet, otherwise it became too overwhelming for the few providers that used them. They also suggested that there should be some consequences for those that did not comply with the guidelines for managing patients with diabetes. One suggestion was that some of the charts should be audited and any provider who did not have a flow sheet filled out on their patient be reprimanded.

Quantitative Analysis of Family Practice Physicians/Providers

Physician attitudes toward the elderly. There were three hypotheses that addressed the physician's attitude towards the elderly. The first hypothesis between the two sites stated that, "*the study group physicians will have a more positive attitude towards patients than the control group physicians after the intervention program.*" This hypothesis was not supported by the results. Results on the effect of the intervention on the provider's attitude towards the elderly as measured by the Geriatric Assessment Scale are presented in Table 9. The Mann-Whitney U was used to determine if there was a significant difference between the two sites on the attitudes of the providers towards the elderly. There was no significant difference between the two sites on the physician attitudes towards the elderly before the program started ($p=.070$) or after the program ended ($p=.357$).

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Table 9

Differences Between the two Sites on Attitudes towards the Elderly (Mann-Whitney U) and Within Each Site (Wilcoxon Signed Ranks Test)

Attitudes	Intervention Site M_x	(n)	Comparison Site M_x	(n)	Mann-Whitney U p-value (between)
Attitude towards Geriatrics					
Before Program	32.19	(32)	29.52	(23)	.070
After Program	29.96	(27)	28.41	(17)	.357
Wilcoxon Signed Ranks p-value (within)	.329		.669		

Note: Scores range from 14-70. High scores indicate more negative view towards elderly.

The second hypothesis stated that, "*the study group physicians will have a more positive attitude towards elderly patients after the intervention program than before.*" This hypothesis was not supported by the results in this study. The Wilcoxon Signed Ranks Test was used to assess a difference in the scores on the Geriatric Attitude Scale before the program began and the scores after the program ended (see Table 9). There were no significant differences between the scores before the program began and the scores after the program ended for the intervention site (p=.329) or the comparison site (p=.669).

The third hypothesis stated that, "*the physicians will have a more positive attitude towards elderly patients after the intervention program controlling for pretest scores regardless of the gender of the provider, the type provider, or the practice site..*" This hypothesis was not supported by the data obtained in this study. Three ANCOVAs were run to answer this hypothesis. In all of the ANCOVAs, posttest scores served as the dependent variable and pretest scores as the covariate. With the first ANCOVA, there was no difference between the men and women providers on posttest GAS scores

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(p=.364). With the second ANCOVA, there was no difference between provider type on posttest GAS scores (p=.785). The third ANCOVA indicated that there was no significant difference between the practice sites on posttest GAS scores (p=.710).

Interdisciplinary collaboration. Three hypotheses addressed the providers' attitude towards interdisciplinary collaboration using the Interdisciplinary Collaboration Scale (ICS). The first hypotheses stated, "*the study group physicians will have a more positive view of working closely with other disciplines than the control group physicians after the intervention program.*" The Mann-Whitney U test was used to determine if there was a significant difference between the two sites on the attitudes of the providers towards interdisciplinary collaboration (see Table 10). There were significant differences between the two sites on the physician attitudes towards working with other disciplines before the program started in the areas of collaboration with nurse practitioners (p=.020) and collaboration with psychologists (p=.013). The providers at the intervention site had more positive views towards collaborating with the two disciplines. There were no significant differences between the two sites after the program ended for collaboration with nurse practitioners (p=.615) or psychologists (p=.092). There were no significant differences between the two sites on collaboration with social workers or the nutritionist before or after the program at either site.

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Table 10

Comparison Between the two Sites on Provider's Attitude towards Collaborating with Each Discipline (Mann-Whitney U) and Within Each Site (Wilcoxon Signed Ranks)[a]

Providers' Attitudes Towards:	Intervention Site M_1	(n)	Comparison Site M_1	(n)	Mann-Whitney U p-value (between)
Nurse Practitioner					
Before Program	66.19	(32)	54.27	(22)	.020[b]
After Program	60.38	(24)	54.59	(17)	.615
Wilcoxon Signed Ranks p-value (within)	.755		.509		
Psychologist					
Before Program	67.19	(32)	55.86	(22)	.013[b]
After Program	52.33	(24)	43.82	(17)	.092
Wilcoxon Signed Ranks p-value (within)	.011[b]		.003[b]		
Social Worker					
Before Program	52.63	(32)	45.95	(22)	.183
After Program	46.50	(24)	41.88	(17)	.249
Wilcoxon Signed Ranks p-value (within)	.132		.363		
Nutritionist					
Before Program	56.16	(32)	48.73	(22)	.125
After Program	48.08	(24)	42.06	(17)	.156
Wilcoxon Signed Ranks p-value (within)	.033[b]		.022[b]		

[a] Interdisciplinary Collaboration is measured by the Interdisciplinary Collaboration Scale (ICS). Scores range from 25 (negative attitude towards the discipline) to 150 (positive attitudes towards the discipline).

[b] Significance level <.05

The second hypothesis stated, "*the study group physicians will have a more positive*

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view of working closely with other disciplines after the intervention than before." Wilcoxon Signed Ranks Test was used to assess a difference in the scores on the Interdisciplinary Collaboration Scale before the program began and the scores after the program ended (see Table 10). There were no significant differences between the scores before the program began and the scores after the program ended for the intervention site regarding collaboration with nurse practitioners (p=.755) and collaboration with social workers (p=.132). There was also no significant difference for the comparison site in collaboration with nurse practitioners (p=.509) and collaboration with social workers (p=.363). There were significant differences for both sites regarding collaboration with the psychologist (p=.011 for intervention site and p=.003 for comparison site) and regarding collaboration with nutritionists (p=.033 for intervention site and p=.022 for comparison site). The mean overall score on the collaboration scale declined for all disciplines from the scores before the program and the scores after the program at the intervention site and for all of the disciplines except collaboration with nurse practitioners at the comparison site. This suggested that the providers at both sites felt less favorable towards collaborating with other disciplines after the intervention. The mean scores after the program were not significantly different between the comparison site and the intervention site indicating no difference in the provider view of collaboration with the various disciplines at either site.

The third hypothesis stated that, "*the physicians will have a more positive attitude towards working with other disciplines after the intervention program controlling for pretest scores regardless of the gender of the provider, the type provider, or the practice site.*" This hypothesis was not supported by the data obtained in this study. Three

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ANCOVAs were conducted to answer this hypothesis for each discipline. In all of the ANCOVAs, posttest scores served as the dependent variable. With the first ANCOVA, there was no difference between the men and women providers on posttest ICS scores after controlling for pretest ICS scores related to nurse practitioners (p=.173), psychologists (p=.422), social workers (p=.915), and nutritionists (p=.670). With the second ANCOVA, there was no difference between provider type (resident or faculty) on posttest ICS scores after controlling for pretest ICS scores related to any of the disciplines. The third ANCOVA indicated that there was no significant difference between the practice sites on posttest ICS scores when controlling for pretest related to any of the disciplines.

Referral patterns. Two hypotheses were addressed as they relate to the referral patterns of the providers using a researcher-developed questionnaire (see Table 11 & 12). The first hypothesis stated that, "*the study group physicians will refer patients with type 2 diabetes to more resources than the control group physicians after the intervention.*" Two specific referral sources were assessed: referrals to community resources and referrals to consultants. Results of referrals to the resources are presented in Table 11 (community resources) and Table 12 (consultants). Chi-Square was used to assess differences between the two sites on referral patterns. There were no significant differences between the two sites on referral to resources or consultants before or after the program.

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Table 11

Percentages of those who do Refer to Resources and Differences on Referrals to Resources Between the two Sites (Chi-Square) and Within Each Site (McNemar)

Referral To:	**Intervention Site**		**Comparison Site**		**Chi-Square**
	%	**(n)**	**%**	**(n)**	**p-value (between)**
Diabetes Support Group					
Before Program	10.0	(30)	9.0	(21)	1.000
After Program	13.8	(29)	17.6	(17)	1.000
McNemar p-value (within)	1.000		1.000		
Nutritional Support Group					
Before Program	25.8	(31)	13.6	(22)	.464
After Program	27.6	(29)	17.6	(17)	.686
McNemar p-value (within)	.500		.688		
Diabetes Education Class					
Before Program	38.7	(31)	54.5	(22)	.389
After Program	34.5	(29)	41.2	(17)	.891
McNemar p-value (within)	.688		.125		
Exercise Class					
Before Program	9.7	(31)	27.3	(22)	.190
After Program	24.1	(29)	35.3	(17)	.637
McNemar p-value (within)	.688		1.000		
Summary Referral Scale[a]					
Before Program	35.5	(31)	50.0	(22)	.439
After Program	41.4	(29)	47.1	(17)	.947
McNemar p-value (within)	1.000		.727		

[a]Total percent of providers that referred some, most, or almost all of their patients to at least 2 of the above 4 community resources.

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Table 12

Percentages of those who refer to Consultants and Differences on Referral to Consultants Between the two Sites (Chi Square) and Within Each Site (McNemar)

Referral To:	**Intervention Site**		**Comparison Site**		**Chi Square**
	%	**(n)**	**%**	**(n)**	**p-value (between)**
Nutritionist					
Before Program	48.4	(31)	54.5	(22)	.870
After Program	51.7	(29)	17.6	(17)	1.000
McNemar p-value (within)	1.000		1.000		
Diabetes Educator					
Before Program	32.3	(31)	31.8	(22)	1.000
After Program	34.5	(29)	41.2	(17)	.891
McNemar p-value (within)	1.000		.625		
Podiatrist					
Before Program	27.6	(29)	45.5	(22)	.305
After Program	44.8	(29)	58.8	(17)	.541
McNemar p-value (within)	.500		1.000		
Ophthamologist					
Before Program	93.3	(30)	95.5	(22)	1.000
After Program	93.1	(29)	94.1	(17)	1.000
McNemar p-value (within)	1.000		.500		
Summary Referral Scale[a]					
Before Program	71.0	(31)	90.9	(22)	.156
After Program	86.2	(29)	88.2	(17)	1.000
McNemar p-value (within)	.500		1.000		

[a] Total percent of providers that referred some, most, or almost all of their patients to at least 2 of the above 4 community resources.

The second hypothesis stated that, "*the study group physicians will refer patients with type 2 diabetes to more resources after the intervention than before.*" The McNemar test was used to assess differences between score before and after the program at each site (see Tables 11 & 12). There were no significant differences between the pre- and post-

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program scores on the frequency the providers referred patients to community resources at either site.

Clinical guidelines. Two hypotheses were addressed as they relate to the compliance of providers with clinical guidelines using a researcher-developed questionnaire. The first hypothesis stated that, "*the study group physicians will be more compliant with clinical guidelines than the comparison group physicians.*" Chi-Square was used to assess the differences between the two sites on provider compliance to clinical guidelines (see Table 13). There were significant differences between the two sites on compliance with guidelines related to eye exams (p=.032), and monitoring lipid levels (p=.044) before the intervention. There were significant differences after the intervention between the two sites related to foot exams (p=.021) and monitoring lipid levels (p=.004). The intervention site did better than the comparison site on referring for eye exams before the program. The comparison site did better than the intervention site on obtaining lipid levels before and after the program. The comparison site also conducted more foot exams than the intervention site after the program.

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Table 13

Comparison Between the two Sites on Performance of Clinical Guidelines (Chi-Square) and Within Each Site (McNemar)

Performance of Guidelines by providers	Intervention Site n	%	Comparison Site n	%	Chi-Square p-value (between)
80% Overall Compliance					
Before Program	20	21.3	37	35.9	.035*
After Program	27	31.8	39	45.3	.095
McNemar p-value (within)	.243		.499		
HgA1c					
Before Program	81	85.3	90	86.5	.957
After Program	63	72.4	70	81.4	.222
McNemar p-value (within)	.078		.332		
Foot Exam					
Before Program	70	73.7	86	82.7	.171
After Program	58	59.8	79	76.0	.021*
McNemar p-value (within)	.059		.281		
Eye Exam					
Before Program	50	52.6	38	36.5	.032*
After Program	44	45.4	42	40.4	.569
McNemar p-value (within)	.377		.643		
Lipids					
Before Program	52	55.3	73	70.2	.044*
After Program	43	49.4	62	72.1	.004*
McNemar p-value (within)	.405		1.00		
Microalbumin					
Before Program	11	11.6	14	13.5	.852
After Program	6	6.8	14	16.3	.086
McNemar p-value (within)	.302		1.00		
Cardiovascular Exam					
Before Program	77	81.1	91	87.5	.290
After Program	70	72.2	84	80.8	.203
McNemar p-value (within)	.216		.248		

*p<.05

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The second hypothesis stated that, "*the study group physicians will be more compliant with the clinical guidelines after the intervention than before.*" The McNemar test was used to assess differences between scores before and after the program at each site (see Tables 13). There were no significant differences between the pre- and post-program scores on compliance with clinical guidelines at either site. However, there was a borderline significance in the frequency of obtaining a HgA1c and assessing the feet at the intervention site.

Documentation of behavioral intervention. Two hypotheses were addressed as they relate to the compliance of providers with behavioral guidelines using a researcher-developed questionnaire. The first hypothesis stated that, "*the study group physicians will more frequently document behavioral interventions than the comparison group physicians.*" Chi-Square was used to assess the differences between the two sites on provider compliance with behavioral guidelines (see Table 14). There were significant differences between the two sites on compliance with behavioral guidelines related to home glucose monitoring ($p<.001$) before and after the intervention. The comparison site did better in monitoring home glucose levels both before and after the intervention.

The second hypothesis stated that, "*the study group physicians will more frequently document behavioral interventions after the program than before the program.*" The McNemar test was used to assess differences between score before and after the program at each site (see Tables 14). There was a significant difference between the pre- and post-program scores on monitoring home glucose levels ($p=.015$). Before the intervention, the comparison site was significantly better. While the providers at the intervention site

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significantly improved the frequency of checking home glucose levels, they were still not as good as the comparison site after the intervention.

Table 14

Comparison Between the two Sites on Adherence to Behavioral Guidelines (Chi-Square) and Within Each Site (McNemar Test)

Performance of Guidelines % performed by providers	**Intervention Site**		**Comparison Site**		**Chi-Square**
	n	**%**	**n**	**%**	**p-value (between)**
Home Glucose					
Before Program	27	28.4	67	65.0	.000*
After Program	39	44.8	64	73.6	.000*
McNemar p-value (within)	.015*		.307		
Diet Review					
Before Program	32	33.7	44	42.3	.269
After Program	30	30.9	36	34.6	.685
McNemar p-value (within)	.877		.302		

*p<.05

Functioning on interdisciplinary teams. Two hypotheses addressed the performance of the providers on teams at the two sites based on data from the Teamwork Scale. The first hypothesis stated, "*the study group providers will work better in interdisciplinary teams than the comparison group physicians after the intervention.*" The Mann-Whitney U test was used to assess if there was a significant difference between the two sites on the team performance of the providers (see Table 15). There were significant differences between the two sites before the intervention in the categories of team leadership (p=.032), and team feedback (p=.032) with the providers at the intervention site performing better. There was also a significant difference between the two sites after the intervention in the category of team feedback (p=.032) with the providers at the intervention site performing better.

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Table 15

Comparison Between the two Sites on Team Behavior (Mann-Whitney U) and Within Each Site (Wilcoxon Signed Ranks Test)

Team Behaviors (range)	**Intervention Site** M_x	**(n)**	**Comparison Site** M_x	**(n)**	**Mann Whitney U p-value (between)**
Team Orientation (20-100)					
Before Program	74.4	(5)	61.7	(4)	.413
After Program	76.0	(5)	74.6	(5)	.690
Wilcoxon Signed Ranks p-value (within)	.593		.144		
Team Leadership (18-90)					
Before Program	64.2	(5)	53.0	(4)	.032*
After Program	63.4	(5)	60.4	(5)	.548
Wilcoxon Signed Ranks p-value (within)	.577		.465		
Team Communication (11-55)					
Before Program	41.4	(5)	32.5	(4)	.190
After Program	42.4	(5)	38.2	(5)	.548
Wilcoxon Signed Ranks p-value (within)	.285		.273		
Team Monitoring (9-45)					
Before Program	30.0	(5)	21.5	(4)	.063
After Program	31.8	(5)	28.2	(5)	.222
Wilcoxon Signed Ranks p-value (within)	.465		.102		
Team Feedback (9-45)					
Before Program	33.2	(5)	25.5	(4)	.032*
After Program	35.8	(5)	27.2	(5)	.032*
Wilcoxon Signed Ranks p-value (within)	.593		.854		
Team Backup (9-45)					
Before Program	30.8	(5)	24.5	(4)	.063
After Program	33.4	(5)	30.0	(5)	.690
Wilcoxon Signed Ranks p-value (within)	.465		.357		
Team Coordination (9-45)					
Before Program	30.4	(5)	23.7	(4)	.063
After Program	33.4	(5)	34.0	(5)	.690
Wilcoxon Signed Ranks p-value (within)	.276		.068		

Note: Higher scores indicate better team performance.
*$p<.05$

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The second hypothesis stated, "*the study group providers will work better in interdisciplinary teams after the intervention than before the intervention.*" Wilcoxon Signed Ranks Test was used to assess the differences in team performance within each site before and after the intervention (see Table 15). There were no significant differences before and after the intervention at either of the two sites in any of the teamwork categories on the Teamwork Scale.

Patient Outcomes

Patient's satisfaction with the patient-doctor interaction. There were four hypotheses that addressed patient satisfaction with their provider. The first hypothesis stated that, "*the study group patients with type 2 diabetes will be more satisfied with their physicians than the comparison group patients after the intervention.*" This hypothesis was supported by the results of the Mann-Whitney U test (see Table 16). The study group had a significantly higher score ($p<.05$) on the PDIS ($M_x=85.65$) than the comparison group ($M_x=79.35$). This occurred even though the study group had a significantly lower score before the program started.

The second hypothesis stated that, "*the study group patients with type 2 diabetes will be more satisfied with their physicians after the intervention than before the intervention.*" This hypothesis was also supported in this study using the Wilcoxon Signed Ranks Test (see Table 16). The study group had a significantly higher score ($p<.05$) on the PDIS after the intervention ($M_x=85.65$) than before the intervention ($M_x=75.75$). There was no significant difference on the PDIS scores before and after the intervention at the comparison site.

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Table 16

Comparison of Means (M_x) Between the two Sites on Satisfaction with Patient-Doctor Interaction (Mann-Whitney U) and Within Each Site (Wilcoxon Signed Ranks Test) using the Patient-Doctor Interaction Scale (PDIS)

Patient Satisfaction	**Intervention Site** M_x	**(n)**	**Comparison Site** M_x	**(n)**	**Mann-Whitney U p-value (between)**
Satisfaction with Physician					
Before Program	75.75	(68)	78.73	(65)	.001*
After Program	85.65	(49)	79.35	(61)	.000*
Wilcoxon Signed Ranks p-value (within)	.001*		.245		

Note: Scores on PDIS range from 19 (low satisfaction) to 95 (high satisfaction).
* Significance $p<.05$

The third hypothesis stated that, "*the study group patients with type 2 diabetes will be more satisfied with their physicians than the comparison group patients after the intervention controlling for pretest.*" This hypothesis was supported by the data obtained in this study with an ANCOVA. The ANCOVA, with practice site as the factors and pretest PDIS score as the covariate, showed a significant difference in the PDIS scores after controlling for pretest ($p<.001$).

The fourth hypothesis stated that, "*the study group patients will be more satisfied with their physicians after the intervention when pretest satisfaction scores, gender, and provider type are controlled for.*" This hypothesis was supported by the data (see Table 17). A multiple linear regression was calculated in order to predict patient satisfaction based on pretest satisfaction scores, patient gender, provider type (resident or physician), and site. A significant regression equation was found [$F(4,66) = 4.433$, $p<.003$] with an R Square of .212 and an adjusted R Square of .164. This indicated that 16.4% of the variance was accounted for by the variables in the model. Site was the strongest predictor

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of satisfaction (Beta = -.426, p<.001). The other variables in the model were not found to be significant, however, pretest scores were borderline with p=.088. The intervention site had the highest level of satisfaction after the intervention. The predicted score for the patients on satisfaction with their provider is equal to 73.987 + .209 (pretest) + .953 (gender) + 2.32 (provider) – 6.265 (site).

Table 17

Multiple Linear Regression Analysis for Patient Satisfaction after the Intervention Adjusted for Pretest Satisfaction Scores, Gender, Provider Type, and Site

Variables	B(SE)	Standardized Beta	95% CI	t	Sig.
Constant	73.99 (10.75)		52.53, 95.45	6.88	.000*
Pretest	.209 (.121)	.194	-.032, .451	1.73	.088
Gender	.953 (1.86)	.057	-2.76, 4.67	.513	.610
Provider	.232 (1.65)	.016	-3.06, 3.52	.141	.888
Site	-6.265 (1.62)	-.426	-9.50, -3.03	-3.865	.000*

Adjusted R Square = .164 (coefficient of determination)
F=4.433
Significance F = .003
df = 4, 66
n = 70
*significance level p<.05

Quality of life. Two hypotheses address the quality of life of the patients with type 2 diabetes using the SF-36. The first hypothesis stated that, "*the study group patients will have higher levels of quality of life as measured by the SF-36 than the comparison group patients after the intervention.*" The Mann-Whitney U test was used to determine if there was a significant difference between the two sites on the quality of life of the patients with

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type 2 diabetes (see Table 18). There were significant differences between the two groups prior to the intervention in the areas of bodily pain ($p<.001$), role functioning ($p<.001$), and vitality ($p=.017$) with the comparison group having lower scores. After the intervention, there was a significant difference between the two groups on physical functioning ($p=.001$) with the intervention group having significantly higher scores. There was no difference between the two groups on physical functioning before the intervention began.

The second hypothesis stated that, "*the study group patients will have higher levels of quality of life as measured by the SF-36 after the intervention than before the intervention.*" Wilcoxon Signed Ranks Test was used to assess differences in the scores on the SF-36 before and after the intervention at the two sites (see Table 18). There was a significant improvement between scores before and after the intervention at the intervention site in the areas of physical functioning ($p=.047$), social functioning ($p=.003$), and mental health ($p=.022$). The comparison group also had a significant improvement in the areas of social functioning ($p<.001$) and mental health ($p=.012$), however, only the intervention group had a significant improvement in physical functioning.

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Table 18

Comparison Between the two Sites on Quality of Life as Measured by the SF-36 (Mann-Whitney U) and Within Each Site (Wilcoxon Signed Ranks Test)

Categories of SF-36 (ranges[a])	**Intervention Site** M_x	**(n)**	**Comparison Site** M_x	**(n)**	**Mann Whitney U p-value (between)**
Bodily Pain (2-10)					
Before Program	9.06	(73)	7.14	(71)	.000*
After Program	9.41	(50)	8.63	(59)	.314
Wilcoxon Signed Ranks p-value (within)	.228		.000*		
Physical Functioning (10-30)					
Before Program	21.95	(73)	20.58	(71)	.178
After Program	24.82	(50)	21.15	(59)	.001*
Wilcoxon Signed Ranks p-value (within)	.047*		.085		
Role-Physical (4-8)					
Before Program	7.36	(73)	6.30	(70)	.000*
After Program	7.06	(50)	6.58	(59)	.187
Wilcoxon Signed Ranks p-value (within)	.060		.069		
General Health (5-25)					
Before Program	15.67	(72)	15.27	(70)	.549
After Program	15.81	(49)	15.81	(58)	.858
Wilcoxon Signed Ranks p-value (within)	.316		.064		
Vitality (4-24)					
Before Program	14.83	(70)	13.01	(71)	.017*
After Program	14.96	(49)	13.62	(58)	.152
Wilcoxon Signed Ranks p-value (within)	.392		.118		
Mental Health (5-30)					
Before Program	23.67	(70)	23.39	(71)	.105
After Program	25.29	(49)	24.95	(58)	.680
Wilcoxon Signed Ranks p-value (within)	.022*		.012*		
Health Transition (1-5)					
Before Program	2.95	(73)	3.07	(71)	.333
After Program	2.92	(50)	2.76	(59)	.178
Wilcoxon Signed Ranks p-value (within)	.319		.102		

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Table 18 (continued)

Categories of SF-36 (ranges)	Intervention Site M_x	(n)	Comparison Site M_x	(n)	Mann Whitney U p-value (between)
Social Functioning (2-10)					
Before Program	8.04	(72)	7.68	(71)	.195
After Program	9.32	(50)	9.30	(59)	.712
Wilcoxon Signed Ranks p-value (within)	.003*		.000*		
Role Emotional (3-6)					
Before Program	5.52	(73)	5.28	(71)	.122
After Program	5.58	(50)	5.53	(59)	.889
Wilcoxon Signed Ranks p-value (within)	.322		.266		

[a]Higher scores indicate better quality of life
*$p<.05$

Clinical outcomes. Three hypotheses address the clinical outcomes of the patients with type 2 diabetes. The first hypothesis stated that, "*the study group patients will have more improved clinical outcomes than the comparison group patients after the intervention.*" The Mann-Whitney U test was used to determine if there was a significant difference between the two sites on the clinical outcomes of the patients with type 2 diabetes (see Table 19). There were significant differences between the two groups prior to the intervention in the area of diastolic blood pressure ($p=.020$) with the comparison group having lower blood pressures. After the intervention, there was a significant difference between the two groups in the same category.

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Table 19

Comparison Between the two Sites on Clinical Outcomes (Mann-Whitney U) and Within Each Site (Wilcoxon Signed Ranks Test)

Clinical Outcomes	**Intervention Site** M_x	**sd**	**Comparison Site** M_x	**sd**	**Mann-Whitney U p-value (between)**
Weight					
Before Program	187.01	41.40	191.54	45.05	.710
After Program	185.42	48.42	197.19	49.79	.238
Wilcoxon Signed Ranks p-value (within)	.974		.322		
Systolic BP					
Before Program	140.23	23.97	142.91	17.49	.306
After Program	141.25	22.85	140.28	18.35	.773
Wilcoxon Signed Ranks p-value (within)	.822		.113		
Diastolic BP					
Before Program	79.54	17.36	74.96	10.55	.020*
After Program	78.49	10.81	74.67	11.12	.033*
Wilcoxon Signed Ranks p-value (within)	.931		.799		
HgA1c					
Before Program	8.26	1.67	8.58	2.07	.437
After Program	8.09	1.83	8.35	2.00	.371
Wilcoxon Signed Ranks p-value (within)	.013*		.133		
Home Glucose					
Before Program	148.04	41.47	158.25	51.96	.333
After Program	145.13	38.48	147.81	42.32	.647
Wilcoxon Signed Ranks p-value (within)	.334		.079		
Cholesterol					
Before Program	213.47	40.70	204.02	39.42	.126
After Program	206.84	36.39	198.31	44.17	.273
Wilcoxon Signed Ranks p-value (within)	.476		.009*		

*significance level p<..05

The second hypothesis stated that, "*the study group patients will have more improved clinical outcomes after the intervention than before the intervention.*" The Wilcoxon Signed Ranks test was used to assess differences in the clinical outcomes before and after

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the intervention at the two sites (see Table 19). There was a significant difference between scores before and after the intervention at the intervention site in the HgA1c level (p=.013) with the HgA1c levels improving after the intervention. The comparison group had a significant drop in cholesterol level (p=.009) after the intervention.

The third hypothesis stated that, "*the study group patients with type 2 diabetes will have a better HgA1c level than the comparison group patients after the intervention controlling for pretest.*" This hypothesis was not supported by the data obtained in this study with an ANCOVA. The ANCOVA, with practice site as the factor and pretest HgA1c as the covariate, showed no significant difference in the HgA1c.

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CHAPTER V

Conclusions

This study sought to test the usefulness of the Enhanced Primary Care Model as a theoretical framework for training providers to address the healthcare needs of elderly patients with a chronic illness. Specifically, this study assessed the impact that an interdisciplinary team had on improving the way healthcare providers address the biopsychosocial conditions of elderly patients with type 2 diabetes. Two sites were assessed in this study, the intervention site and the comparison site. The intervention site is a family practice clinical and residency program that received the intervention program developed and implemented by the interdisciplinary diabetes team based on the Enhanced Primary Care Model. The comparison site is a family practice clinical and residency program that did not receive an intervention. Family physicians, family practice residents, geriatric patients with type 2 diabetes, and the interdisciplinary diabetes team were assessed. Both quantitative and qualitative approaches were used to analyze the data.

This study does not support the use of the Enhanced Primary Care Model as a theoretical framework for improving provider and patient outcomes related to type 2 diabetes. In general, the team members felt the interdisciplinary diabetes team functioned well as a team. The team was able to accomplish the tasks related to developing and implementing programs to improve the use of clinical guidelines and to focus on behavioral changes. However, as a result of the programs implemented, there were very few changes in the way the providers managed patients with type 2 diabetes. Furthermore, there were very few improvements in the healthcare outcomes of the patients in the study.

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The results of this study and implications for education, practice, and research are discussed as they apply to each of the categories of the Enhanced Primary Care Model. The constructs of the Enhanced Primary Care Model include goal setting for a specified problem, assembly of an interdisciplinary team, development and utilization of a patient database, implementation of programs to create behavioral changes, implementation of clinical guidelines, and assessment of healthcare outcomes. The qualitative and quantitative assessments of the team were used to address all of these constructs except outcomes. Outcomes were assessed with both the providers and the patients. Specifically, the providers were assessed focusing on process outcomes and the patients were assessed focusing on clinical outcomes. The outcomes measure the overall effectiveness of the model.

Overview

Set Problem Specific Goals

The first step in the Enhanced Primary Care model is to set goals for managing a patient population. In this study, the patient population was patients with type 2 diabetes. Based on the need in the department of family medicine to improve the care of patients with diabetes, an interdisciplinary team was assembled. The goals set for the team by the department focused on programs that would improve the way the providers in the department provided care thus improving the healthcare outcomes of patients with type 2 diabetes. The specific clinical goals were directed at meeting the ADA guidelines for managing patients with type 2 diabetes. Some of the clinical goals that are appropriate when working with patients with diabetes, and were addressed in this study, include having (1) a blood pressure of below 140/90 mm Hg, (2) a HgA1c below 8%, and (3) a

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cholesterol level below 200. In addition, behavioral goals were set to address provider compliance with the guidelines for managing patients with diabetes and to facilitate providers developing a positive attitude towards working with elderly populations, as well as with other disciplines.

The first construct of the Enhanced Primary Care Model focusing on goal setting was successfully accomplished in this study. The goals that were set will be addressed in the following discussion of the Enhanced Primary Care Model constructs.

Interdisciplinary Teams

The second step in the Enhanced Primary Care Model was to establish an interdisciplinary team to accomplish the goals. In accordance with the model, the interdisciplinary diabetes team was established. The interdisciplinary diabetes team consisted of a family practice physician, a nurse practitioner/diabetes educator, a nutritionist/diabetes educator, a psychologist, a chaplain, a research nurse practitioner, and a database manager/MPH. The members of the team, with the exception of the chaplain, assumed equal responsibility in accomplishing the tasks required by the team. The chaplain left the team after two months due to difficulty in defining her role. The chaplain was initially assigned to the team in order to help train the providers in dealing with the spiritual needs of patients suffering from a chronic illness such as diabetes. However, her services were not incorporated into the programs. The failure to effectively utilize the chaplain may have been related to a lack of initiative on her part or a change in the direction of the programs so that spirituality was not seen as a relevant component. Spirituality is an important aspect of dealing with chronic illness. Therefore, it may be important to have a chaplain on future interdisciplinary diabetes teams. However, success

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will likely be dependent on having a chaplain that is assertive regarding what they have to offer the team. In addition, other team members may try to find ways to incorporate spirituality into their programs. The absence of the chaplain on the team did not inhibit the tasks conducted by the other team members. The remaining team members were responsible for leading at least one effort in program development and implementation. The team members saw this as a major strength of the team.

According to Dickinson and McIntyre (1996), successful teams consist of both teamwork and taskwork. In this study, teamwork or how the team worked together behaviorally was assessed with the Teamwork Scale. The constructs examined included communication, orientation, leadership, monitoring, feedback, backup behavior, and coordination. The interdisciplinary diabetes team tended to score around three in all of the categories of the Teamwork Scale suggesting that performance was neither exceptional nor poor. The team performance in all of the categories did decline as the team was coming to an end. During the last four months of the study, a number of factors occurred that impacted how the team performed behaviorally. The team members began receiving feedback on the programs they had implemented. Many of the providers were saying that they did not want to change the way they managed the care of their patients with diabetes because it worked well for them. The residents found it difficult to implement the programs such as the flow sheet when only a few of the providers were willing to implement them. In addition, the data on patient outcomes did not indicate an improvement. At the same time, the psychologist and the nutritionist left the department due to better job offers and funding issues. This left the remaining team members with added responsibilities. As a result, the team members were left with the realization that

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they had to work harder to continue as a team. Yet, the data suggested that the programs developed by the team were not improving how the providers managed patients with type 2 diabetes. The team members began to lose their desire to continue. This situation was supported by the fact that the category of monitoring was scored the lowest throughout the study period. This suggests that the team members did not tend to monitor the performance of each other. Therefore, they were unable to assume the responsibilities of the nutritionist and psychologist when they left.

The establishment of the interdisciplinary diabetes team was seen as both a success and a failure. The team members, as well as the providers in the practice, indicated that they saw the team as very successful. Specifically, the team members felt they worked well together and each person contributed significantly to accomplishing the team goals. The team was able to accomplish the tasks they thought would improve the management of patients with type 2 diabetes. Thus, the team was effective in accomplishing taskwork. The team was not as successful in teamwork. When the team was faced with change and negative feedback, it was unable to continue. As a result, the team was discontinued at the end of the study.

In order to maintain a similar team in the healthcare arena, it is important to provide the team members with a supportive environment. Team members should be in a system where they are empowered to make a difference and where the personnel are open to change. Team members need to have time designated for team activities. In order to improve the implementation of program, it may be necessary to have a member of the team serve as a "champion." This individual would be responsible for assessing programs and reminding the providers to participate in the programs that are implemented to

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improve healthcare. The champion would also work with the department to maintain environmental support. Teams should take time to assess how well they are functioning behaviorally in order to support each other when times are stressful.

Developing and Utilizing a Patient Database

The third step in the Enhanced Primary Care Model is to develop and utilize a patient database in order to improve the care of patients with diabetes. A database was successfully assembled and used by the interdisciplinary diabetes team in this study. The results of the qualitative assessment obtained through both interviews and observation of team members indicated that a database was developed on patients with type 2 diabetes at the intervention site. The database consisted of patient demographics, lab values, frequency of assessments, educational activities, and provider compliance. The data were obtained from chart audits, patient interviews, and provider surveys. The team developed and implemented a class for all of the physicians and residents at the intervention site in order to provide them with the findings obtained from the database. As a result, the team members were provided with feedback from the residents and physicians on programs they would like to see implemented in order to improve the care and outcomes related to patients with type 2 diabetes.

Developing and implementing a database on the elderly patients with type 2 diabetes was a success in that it did occur. However, the database was not used as effectively as it should have been. The database was used to make providers aware of needs in the practice and to establish programs as recommended by the Enhanced Primary Care Model. However, the database was not used frequently in order to provide feedback to the providers or patients on their healthcare outcomes. If the feedback had occurred at

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regular intervals and had been directed to individual providers, the providers may have supported the programs more effectively as they realized that their management of diabetes was not up to the level it should be. Furthermore, it was difficult and time-consuming to collect the data for the database. The database showed promise in understanding practice patterns. However, in order to use a database to its highest potential, personnel should be available to collect, interpret, and disseminate the data. These data could be collected most efficiently in practices where computerized charting is the norm.

The findings in the initial database for this study indicated that the intervention site was falling short of meeting the ADA guidelines for managing patients with diabetes. As a result of the database, several programs were developed and implemented to address both clinical and behavioral issues regarding the patients and the providers. These programs will be described under the following sections on clinical and behavioral programs.

Creating Behavioral Changes and Implementing Clinical Guideline

Creating behavioral changes and implementing clinical guidelines are the fourth and fifth constructs in the Enhanced Primary care Model. In order to optimize the health of patients with diabetes, both the patients and the providers must behave in a manner that enables them to follow well-tested clinical guidelines for managing diabetes. Since behavioral changes and clinical guidelines are so dependent on each other when dealing with patients with diabetes, the programs developed in this study contained both components. Behavioral changes include such activities as diabetic diets and monitoring for complications of diabetes. Clinical guidelines focus on clinical assessments, laboratory tests, and referrals.

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In order to assist the providers and patients in improving their behaviors related to managing diabetes, several interventions were developed by the interdisciplinary diabetes team. Data on these interventions were gathered by questioning the providers at the intervention site as well as the members of the interdisciplinary team. Specifically, the interventions included didactic sessions, a newsletter, a diabetes flow sheet, a resource directory, a patient education file, and educational classes for patients with type 2 diabetes. These six interventions were established to make the providers aware of the clinical and behavioral needs of the patients with type 2 diabetes as well as behavioral changes the providers needed to make. During the didactic session, the providers were given information on how frequently behavioral issues and clinical guidelines were documented in their patients' charts. It was found that the physicians had documented checking home glucose monitoring on only 28.4% of their patients and a diet review on only 33.7%. This was better than what had been documented in one study where as few as 10% of the patients with diabetes were routinely found to assess their blood glucose (Harris, Cowie, & Howie, 1993). However, this was not as high as the ADA guidelines would recommend. The newsletter reinforced the need to follow guidelines related to the clinical and behavioral management of patients with type 2 diabetes. Both of these programs were well accepted by the providers. They felt the information provided through the interventions was a good reminder and increased their awareness of the needs of patients with type 2 diabetes. Both of these programs required a tremendous amount of effort. The nutritionist sought people to write articles for the newsletter. She was then responsible for assembling and disseminating the newsletter. All of the team members were responsible for presenting a didactic program on diabetes. This was also very time-

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consuming. Furthermore, the sessions pulled the providers away from other activities. Even though the providers said that the newsletter and the didactic sessions were helpful, the outcomes of this study do not suggest that they made any difference in how the providers practiced. The didactic session was helpful in providing information on the management patients with type 2 diabetes at the intervention site. Furthermore, it did provide a format for better understanding barriers to care encountered by providers in their practices.

The flow sheet consisted of the guidelines recommended by the ADA for managing the behavioral and clinical needs of patients with type 2 diabetes. The flow sheet was placed on the charts of all of the patients in the study at the intervention site. The providers were to fill out the patient information on the flow sheet at each visit. There were mixed feelings regarding using the flow sheet. Many of the physicians did not want to use the flow sheet because they did not want to change the way they already charted. The residents were much more positive about the flow sheet because they found it to save time, improve documentation, and be a better mechanism for providing continuity of care. The residents were frustrated that the physicians did not use the flow sheet because it was hard to provide continuity of care when they saw the physicians' patients on their schedule. These findings are consistent with findings by Ellrodt and colleagues (1997). They found that even when guidelines were well-developed and accepted, failure occurred due to a lack of clinician awareness, guidelines not being conveniently available, lack of confidence in guidelines, patient circumstances, or barriers in the systems. In this study, the flow sheet was not a successful intervention. Too many of the providers at the intervention site were resistant to using it. In order for it to be successful, there was a

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need for it to be used on a practice-wide basis. The flow sheet had the potential to be the single most affective mechanism for changing the way the providers managed the patients with type 2 diabetes. The providers that did use the flow sheet found it to be very instrumental in helping them meet the ADA guidelines. They felt they had a better awareness of their patient's healthcare status. In order for the flow sheet to be utilized on a practice-wide basis at the intervention site, there should be some repercussions when it was not used. This approach was utilized at the intervention site a year ago. Medicare decided that physicians would have to see all of their patients even if they were seen initially by a resident. The physicians would then have to chart their findings on a "blue sheet." This would be in addition to the charting done by the residents. The physicians were resistant to completing the "blue sheets." In order to make the physicians compliant, the practices were threatened with a large fine for all Medicare patients that did not have a "blue sheet" on their chart for each visit. In turn, the practice emphasized the fact that the physicians would be held accountable if the "blue sheet" was not completed. This approach resulted in the providers consistently completing the "blue sheets." A similar approach might be necessary in order to have the providers consistently use the flow sheet.

Even though there are many resources available to patients with type 2 diabetes, patients frequently do not utilize them. This is often due to inadequate knowledge by the patient and their provider regarding the availability and accessibility of the resources (Helseth, Susman, Crabtree, & O'Connor, 1999). This was obvious at the intervention site in this study, with only 10.0% of the patients being referred to diabetes support groups; 38.7% being referred to diabetes education classes; and 25.8% being referred to

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nutritional support classes before the intervention started. In order to improve this low referral rate, a resource directory was implemented by the interdisciplinary diabetes team. The resource directory was a computerized program that listed information on all of the resources available to patients in the Tidewater area of Virginia. The providers could obtain information for patients with diabetes by typing in the resource they needed. The program was placed on centralized computers throughout the practice and on individual provider computers upon request. The providers who used the directory found it to be very helpful. However, most of the providers did not utilize it. They stated that they did not use it due to forgetting about it, not being computer literate, and not having it accessible. Furthermore, it was found that the resource directory program had to be up-dated yearly in order to keep it running. As a result, the program was discontinued at the intervention site after the study was over.

Now that the study has been completed, the comparison site has implemented the resource directory on its own and is very pleased with it. The comparison site is a community-based site. The providers at the comparison site found the resource directory to be another mechanism that would help them coordinate their activities with the community. The intervention site is a medical school-based site that tends to focus more on activities within its own program as opposed to the community. Therefore, even though the referral rate was low, the resource directory was not seen as a needed service at the intervention site. In order for the resource directory to have been more effective, the providers had to recognize the need to refer patients to resources. They then needed to understand how the resource directory could help them.

In order to improve the health-related behaviors of the patients, two intervention

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programs were implemented. These included patient education classes and patient education materials. Classes were offered by the members of the interdisciplinary diabetes team for patients with type 2 diabetes. The classes focused on providing the patients with information on how to manage their diabetes. Emphasis was placed on health behaviors such as diet, exercise, and home glucose monitoring. The classes were well received by patients and providers. The providers felt that the classes helped their patients better understand their illness and become more compliant. The team members even found that the providers were requesting more classes for their patients. The classes were difficult to maintain due to the loss of some team members and the lack of funding. However, the classes were seen as a success by the patients, providers, and team members. The physician and nurse practitioner from the interdisciplinary diabetes team continue to seek funding to re-institute the classes.

As recommended by Peterson and Vinicor (1998), printed educational materials were used to help the patients with behavioral changes. A file cabinet was filled with up-to-date information for patients with type 2 diabetes. The providers found the materials to be very helpful in enabling the patient to understand and remember how to manage their diabetes. They found the materials to be an easy method for providing patients with needed information. The education materials were used by all of the providers with many of their patients. There were recommendations by the providers that folders be developed that would be all inclusive for patients with various knowledge levels. The patient education file is still being utilized by the providers at the intervention site. The interdisciplinary team's nurse practitioner/diabetes educator continues to be responsible for maintaining the files.

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In general, the providers and the patients felt that the programs were good programs, however, they were not utilized well by the providers. It was found that the programs were hard to maintain without extra funding and designated time for the team members. The team members believed the flow sheet would be the single most influential program to improve the care of the patient with diabetes. However, many of the providers refused to use it. The flow sheet is still being used by some of the providers in the practice. The resource directory also showed promise in improving referrals to resources. However, it met with resistance at the intervention site. Surprisingly, the resource directory is now being utilized at the comparison site. The patient education classes and the newsletter were very time-consuming and thus were discontinued after the study due to the lack of personnel and funding. The providers are continuing to look for funding in order to resume the patient education classes. The patient education materials are continuing to be refined and used by the providers. Finally, didactics on diabetes continue to be part of the provider training.

In summary, as directed by the Enhanced Primary Care Model, the interdisciplinary diabetes team was successfully assembled and continued to function for the duration of the study. The team was successful in utilizing a patient database; developing and implementing programs to improve behavioral activities; and developing and implementing interventions to increase the adherence to clinical guideline. Even though the team was successful in carrying out the tasks it felt would improve the care provided to patients with type 2 diabetes, the programs were not very successful. The programs were met with provider resistance that greatly reduced their effectiveness. In addition, the team lost several of its members resulting in an increased workload for the remaining team members.

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The team was terminated after a year due to loss of team members and frustration over the impact of the programs.

In order for the team to have been successful in creating change at the intervention site, the environment had to be more supportive of the team's mission. The providers would have to recognize that everyone had to participate in order for the programs to be effective. When a few physicians refused to accept new management strategies, it made it very difficult for other providers to maintain them. Furthermore, strategies were needed to reinforce the providers' participation in the interventions and hold them accountable for meeting the ADA guidelines.

Assessing Process Outcomes

The final step in the Enhanced Primary Care Model is to assess the outcomes of the programs implemented. It was expected that the intervention programs would improve the knowledge, attitude, and skills the providers had regarding the care of elderly patients with diabetes. Specifically, it was expected that the intervention programs would improve the provider's attitude towards the elderly; their view of collaborating with other disciplines; their referral to resources and consultants; and how well they complied with the ADA guidelines. However, the results of this study did not support the Enhanced Primary Care Model in regards to improving the behaviors of providers.

Attitude towards elderly. The care provided to patients can be dependent on the attitude of the providers to the patient population. This was supported in a study by Weinberger, Cohen, and Mazzuca (1984) where it was shown that the physician's attitude predicted the level of control their patients had over glucose levels. In this study, the providers did not significantly improve their attitude towards elderly patients as a result of

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the intervention. This may have been due to the fact that the providers at both sites tended to have a fairly positive attitude towards the elderly population before the intervention was implemented.

Interdisciplinary collaboration/teamwork. Even though the need for interdisciplinary team care that focuses on community resources is generally recognized, many physicians tend to gravitate towards the traditional model of one-on-one care with the patient (Drinka, 1994). In order to work well in an interdisciplinary team, the providers must have a positive view about collaborating with other disciplines. In this study, the attitudes of the providers towards collaborating with other disciplines was assessed. It was found that the providers had a fairly negative view towards collaborating with nurse practitioners, psychologists, social workers, and nutritionists. Their attitudes were found to become more negative after the intervention program with significant changes related to working with the psychologist and the nutritionist. However, this significant decline in attitude occurred at both sites. Interestingly, both departments lost their psychologist and nutritionist during the study. It may be that the declining attitudes towards the two disciplines were due to the departure of the two faculty or the two faculty left as a result of the declining satisfaction with them. These views were further supported in that the groups observed at each site did not improve significantly in working with others (team performance) during the study.

In order for interdisciplinary teams to be successful in healthcare, the providers must have a positive view towards collaborating with other disciplines. It is not clear why the providers in this study had negative views towards interdisciplinary collaboration. There is a need for further research that would address reasons for this negative attitude. Once

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the reasons are identified, strategies can them be developed to improve the provider attitudes as well as assist with the development of successful interdisciplinary teams. Further study is also needed to determine if the negative views towards interdisciplinary collaboration may have impacted the willingness of the providers to participate in the intervention programs. It may have been that the providers did not value the role of the team members. Therefore, they were not willing to accept interventions developed and implemented by other disciplines.

Referral patterns. Many physicians lack the knowledge and time needed to aid geriatric patients with chronic illness in accessing resources (Helseth, Susman, Crabtree, & O'Connor, 1999). A goal of the intervention programs was to improve the use of resources by patients with diabetes. Although, it was found that more patients were referred to resources and consultants after the intervention, it was not a statistically significant improvement. The highest level of referrals was related to referrals to the ophthamologist with 93.1% of the patients being referred after the program. However, the referral to other providers such as the nutritionist (51.7%), the diabetes educator (34.5%), and the podiatrist (44.8%) were low. The reason for the low referral rate is unclear and should be further researched. It is quite possible that the low referral rate is due to a lack of knowledge regarding how and when to refer patients; a resistance to collaborating with other disciplines; or poor patient compliance. Strategies for improving the low referral rate can be developed once there is a better understanding of the cause.

Compliance with clinical guidelines. The problem in managing patients with type 2 diabetes is that often the guidelines are not followed (Peterson, 1998). This can be the result of the provider not being aware of the current guidelines, or of the patient not being

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knowledgeable or compliant. Data have shown that complications from type 2 diabetes can be decreased by as much as 12% if strict guidelines are followed (Genuth, 1998). Based on the intervention programs in this study, it was expected that the providers would be able to adhere to the ADA guidelines. However, it was found that there was not a significant improvement in the adherence to the clinical guidelines. In fact, the providers decreased in the percentage of patients meeting the guidelines at both sites. This may have been related to other demands facing the providers, time constraints, a lack of recognition that the tests had not been done, or poor compliance by patients. The providers may have felt that the complication resulting from diabetes did not have to be assessed as long as the HgA1c was being monitored. Furthermore, there may have been resentment of many practitioners regarding the feeling that care can be provided in a homogenized manner (Wagner, Austin, & Von Korff, 1996). There is a need for further research into why providers resist clinical guidelines. Strategies can then be implemented to improve adherence to the guidelines.

Healthcare Outcomes

It was expected that in using the Enhanced Primary Care Model there would be an improvement in healthcare outcomes as a result of the programs implemented by the interdisciplinary diabetes team. In order to assess this construct, several hypotheses were addressed. These hypotheses focused on patient satisfaction with the doctor-patient interaction, quality of life, and clinical outcomes. With the exception of patient satisfaction, the results of the study did not support the Enhanced Primary Care Model as a theoretical framework for predicting healthcare outcomes.

Patient satisfaction. It has been shown that the interaction with the patient can be as

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healing as the medication that is prescribed (Falvo & Smith, 1983). Studies have shown that dissatisfaction with the doctor-patient relationship is linked to continuity of care, medical malpractice suits, and noncompliance with medical recommendations (Falvo & Smith, 1983). In order for patients to comply with a physician's recommendations, it is important for the patient to feel positive towards their interaction with the physician. Since compliance is such an important factor in improving a patient's management of diabetes, patient satisfaction was assessed in this study. It was found that the patients were mostly satisfied with the interactions with their providers before the intervention program started. The level of satisfaction improved significantly at the intervention site, but not at the comparison site. This held true even when variables such as pretest satisfaction, age, gender and provider type were factored in. Thus, it appears that the intervention may have had some impact in improving the interaction between the physicians and patients at the intervention site.

There are a number of possible reasons the patients may have been more satisfied as a result of the intervention. First, the need to talk with patients regarding the management of their diabetes was stressed in many of the intervention programs. As a result, the providers may have been more receptive to communicating with the patients thus increasing the patient's satisfaction with the interaction. Second, in order to promote programs such as the diabetes classes, there were flyers throughout the intervention site inviting patients with diabetes to attend the classes. This may have made the patients feel that the practice was interested in their illness, thus increasing their satisfaction. Third, the providers were made aware of the classes and were promoting them with their patients. This may have increased the patient's value of the practice. Fourth, the providers became

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actively involved in providing the patients with patient education materials. This may have increased the patients understanding of their illness and thus their value of the practice. It is difficult to say what actually impacted the patient satisfaction. Further research is needed to better understand how the intervention programs may have functioned to increase satisfaction.

Quality of life. It is widely accepted that the goal of medical care for most patients is to achieve an effective life and preserve function and well-being (Ware, 1997). The patient's perception of how well they feel and function impacts how they respond to their disease. This perception in turn affects how the patient utilizes the healthcare system impacting healthcare costs (Ware, 1997). Patients with chronic illnesses such as diabetes are impacted tremendously by their disease. Many patients with diabetes have to learn to live with not feeling or functioning well. As a result of the disease, their quality of life often declines. A goal of primary care providers is to maximize the quality of life of their patients. In this study, it was shown that quality of life did improve for patients at both sites in most of the categories related to quality of life. Perceived social functioning, physical functioning, and mental health appeared to have the most significant improvement at the intervention site. However, these changes also occurred at the comparison site. Therefore, it is unlikely that these changes were a result of the intervention.

The results of this study did not support the Enhanced Primary Care Model as a theoretical framework related to improved quality of life. The patients scored high in many of the SF-36 categories indicating that they had a high level of quality of life before the program started. As a result of the high levels of quality of life, it may have been difficult for the program to make a great impact. The categories that were the lowest

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were related to the physical aspects of quality of life (physical functioning, general health, and vitality). These scores may have been low as a result of the way the patients felt clinically. These finding were consistent with the clinical findings in this study where the lab values were outside of the normal range. In order to improve quality of life related to physical health, there is a need to improve the patient's clinical status. This would require better adherence to the clinical guidelines by the providers and the patients.

Clinical outcomes. Research has shown that tight control of diabetes by both the provider and the patients can result in greatly improved health outcome. Tight control consists of strict adherence to dietary management, medication, and other medical approaches that result in a HgA1c level below 7.0%. The HgA1c level is the most indicative outcome demonstrating well-managed diabetes. Therefore, having patients with a HgA1c levels of 7.0% or better was a goal of this study. In this study, the patients did achieve a better HgA1c level (from 8.26% to 8.09%) after the intervention. Yet, they did not reach the goal of 7.0% or below that would significantly reduce the complications from diabetes. These results were consistent with the results found in a study by Lasch and Bishop (1997). In their study, the HgA1c level of the patients decreased from an average of 8.9% to 8.4% over 18 months in a study group managed by a team, whereas there was no change in the control group. In this study, although there was a small improvement in the HgA1c level at the comparison site (8.53% to 8.35%), it did not reach significance.

This study did not support the Enhanced Primary Care Model as a theoretical framework for improving clinical outcomes of patients with type 2 diabetes. Even though there was some improvement in clinical outcomes, the improvement was not significant.

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The only category that was statistically significant was HgA1c. However, this significance disappeared when age, gender, and provider type were considered. The failure to significantly improve clinical outcomes may have been a result of the providers not adhering to the clinical guidelines or poor patient compliance with recommendations. Further research that addresses the clinical outcomes in patients who are seen by providers that are compliant with guidelines would increase the understanding of the findings in this study.

Summary

The results of this study suggest that the Enhanced Primary Care Model is not a good model for improving practice patterns or patient outcomes. The providers did not change the way they managed patients with type 2 diabetes as a result of any of the programs developed in this study. Even though the providers had been supportive of the programs when they were conceptualized, they were resistant to making the changes when the programs were actually implemented. Many of the providers expressed the view that their method of practicing was working well so why should they change. However, the clinical data obtained on the patients did not support their view. It was clear that if the providers did not change how they provided care, the patients would not have improved clinical outcomes.

As outlined in the Enhanced Primary Care Model, the department was able to assemble an interdisciplinary team to address the healthcare provided to patients with type 2 diabetes. The team was successful in developing and utilizing a patient database. Based on information obtained from the database, the team was able to implement programs to address behavioral needs and the implementation of clinical guidelines. The Enhanced

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Primary Care Model appeared to successfully describe how an interdisciplinary team could function successfully in addressing the needs of patients with type 2 diabetes. The failure of the model to improve provider behavior and clinical outcomes likely occurred as a result of the providers' resistance to supporting the intervention programs.

The model also failed as a result of the attrition of team members and lack of funding. However, it is very likely that funding would have become available and other team members would have been found if the diabetes program had significantly improved how the providers managed patients with type 2 diabetes.

The results of this study suggest that the Enhanced Primary Care Model may have been useful in increasing patient satisfaction with the doctor-patient interaction. The patients' level of satisfaction increased significantly at the intervention site. The level of patient satisfaction was the only variable that remained significant when controlling for other variables. Further research is needed to support this finding.

Limitations

There were a number of factors that may have affected the results of this study. First, the sample size of providers was small. As a result, nonparametric tests were used to conduct most of the analyses. A larger sample size may have increased the power of the study increasing the likelihood of identifying differences. Second, there was a fair amount of attrition of patients due to patients moving or dying. However, the level of attrition was comparable to many studies. The largest area of attrition (48% attrition) in this study occurred in the number of patients that were accessible for the final phone survey at the intervention site. Third, the study was conducted on patients with type 2 diabetes at two family practice residency sites in Virginia. As a result, the generalizability of the study

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may have been limited. Fourth, there may have been a social desirability bias related to the phone surveys of the patients and the surveys of the provider. The patients may have responded to the questions during the interview as they may have thought the interviewer desired. For instance, the patients may have described their satisfaction with their provider higher than it actually was. The providers may have completed the surveys representing their activities as they felt they should be as opposed to how they actually were. This may have resulted in higher use of resources than actually occurred, or a more positive view of the elderly and other disciplines than actually existed. Fifth, the study may have been more successful if the intervention had occurred over a longer period of time with more reinforcement by members of the team.

The study was also affected by environmental factors that may have affected the success of the intervention. Although, the leadership was supportive of the program in word, their actions were not very supportive. Many of the faculty members refused to utilize interventions such as the resource directory and flow sheet because it changed how they practiced. As a result, they did not encourage the residents to change their way of practicing. There were no methods in place to address the accountability of the providers. In addition, time was not designated for the team members to work on the programs. As a result, they became overwhelmed with keeping the diabetes programs going and completing their other responsibilities.

There were many variables that were not addressed in this study. These include patient and provider knowledge, complications of diabetes, and other behavioral issues such as exercise. It would have been helpful to have had more patient education classes at other times such as evenings and weekends in order to attract more patients. In the study,

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the patient education class series consisted of four weekly classes with a planned follow-up class several months later. During the program, four series of classes were run with between four and 12 people attending the classes. Due to financial concerns, the follow-up classes have not occurred as planned. With more people attending the classes and a follow-up class, it would have been more reasonable to assess how the classes impacted the patients.

Recommendations for Future Research

The results of this study indicate a need for further research into how to best create programs that could improve the management of patients with a chronic illness. Since environmental factors may have been very instrumental in the success of the intervention program developed in this study, it would be worth conducting the same study in an environment where all of the providers were held accountable for improving the way they managed patients. The same study could also be conducted using another less complicated illness. Since the providers in this study were resistant to modifying the way they practiced, this study could be conducted using other healthcare providers such as nurse practitioners.

The Enhanced Primary Care Model was not successful in predicting provider behavior. Nevertheless, there is a need to understand how to improve the management of patients with varying illnesses. Therefore, more research is needed to test other models of care. It may be important to choose models that have an accountability or enforcement component. Furthermore, as this study suggests, there is a need for studies addressing methods to motivate providers to change their management of patients.

The Enhanced Primary Care Model was also not successful in predicting clinical

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outcomes. Since so much of the care of patients with diabetes is dependent on self-care, studies that address educating and empowering patients could be quite beneficial. There are a number of self-care models that could be tested in conjunction with the Enhanced Primary Care Model.

Implications for Education

This study suggests that there is a need for providers to improve how they practice. Specific areas of need include working with other disciplines and working on teams. Current medical education does not train physicians to work with other disciplines. As a result, physicians often practice one-on-one care. This study suggests that providers must improve their attitudes towards other disciplines as well as learn how to work with other disciplines on teams. In order to promote positive working relationships between physicians and other disciplines, training programs should be instituted during medical school, before attitudes about collaboration have been established. Such collaborative emphasis should continue through residency education and into faculty development programs. Collaboration should be seen as part of medicine and not as a interference.

The providers in this study demonstrated a resistance to changing their practice behaviors as well as utilizing well-tested clinical guidelines. As new models of medicine are developed and tested, physicians must be willing to change their practice behaviors to meet the needs of the patient population. Education in medical school and residency programs should promote the use of practice guidelines in order to improve the healthcare of patients with chronic illnesses. In addition, it should be emphasized that medicine is an ever-changing field and physicians should expect to change.

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Implications for Practice

During the 34th Annual Spring Conference of the Society of Teachers in Family Medicine (2001), Kenneth Shine M.D., the president of the Institute of Medicine, gave a plenary address. He emphasized that medicine in the United States was not as successful as other countries in addressing the healthcare needs of its populations. He stated that the United States spends more than twice the amount on healthcare that other industrialized nations spend. Yet, the United States ranks 37th in healthcare outcomes. His taskforce had conducted and reviewed studies throughout the United States. The results indicate that the physicians in the States tend to seek knowledge but are resistant to change; they prefer one-on-one care to the needed team care; they provide individual care as opposed to utilizing clinical guidelines; and they are not very open about the care they provide preferring to practice in isolation. These findings were consistent with the findings in this study.

The results of this study have tremendous implications for practice. Often, large amounts of money are put into programs in order to improve patient care. However, the results of many of these programs are not assessed. Without the data obtained from this study, it is likely that this program would have been seen as a success. It is important that practices assess the programs they implement, so that money is not spent with little benefit achieved. Secondly, if a practice is going to spend time and money on implementing programs, the practice needs to be prepared to make the changes that go with implementing the program. If the providers continue to practice as they always have, they will continue to get the same results they have been getting. Third, it is hard to change physician behavior. Therefore, it may be important to direct programs at empowering

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patients to manage their illnesses and thus enabling the patients to hold their physician accountable. Finally, while providers in healthcare are sometimes willing and able to function well in teams; they need to be empowered, encouraged, and trained in teamwork if they are going to make a difference.

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Appendix A

Dickinsin & McIntyre's Model of Teamwork

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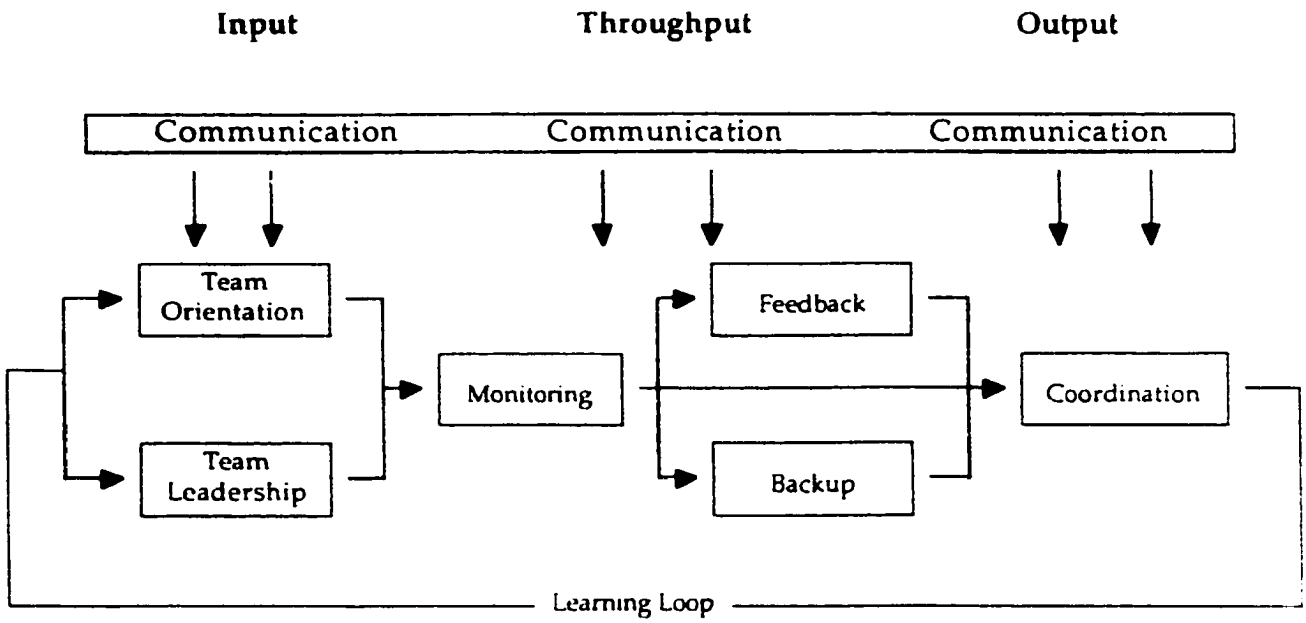
DICKINSIN & MCINTYRE'S MODEL OF TEAMWORK



Communication

Communication is the overriding construct in the teamwork model. It involves the exchange of information between team members and between team members and those outside the team. It links all of the components of the Teamwork Model (Dickinson & McIntyre, 1996). Communication refers to the way members of the team make decisions, handle conflicts, interact with each other, and develop relationships (Wellins, Byham, & Wilson, 1991). Communication is vital to teamwork in that is allows for feedback and information transfer. Through communication, team members can better understand the goal and how they can work together to accomplish it. It enables the team members to be aware of the team's progress, its shortfalls, and need for revisions (Lundy, 1991). In order for teams to communicate effectively, they must treat each other with respect and

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listen attentively (Schwartz, Landis, & Rowe, 1999). Interdisciplinary teams are at risk of minimal progress due to the individual differences of its members, lack of agreement, lack of understanding, and poor communication (Koulikov, 1999).

Team Orientation

Team orientation focuses on the attitudes team members have towards each other, their task, and the leadership (Dickinson & McIntyre, 1996). When there is confusion over roles, a lack of cohesion can occur resulting in deadlock (Koulokov, 1999). When team members do not become involved or are indifferent, very little may be accomplished by the team (Koulokov, 1999). Team success can be increased by recruiting team members that are enthusiastic and invested in the topic of focus (Schwartz, Landis, & Rowe, 1999). Once a team of excited members is assembled, a meeting should occur so that the team members can gather an understanding of the team's charge and learn about each others' roles (Schwartz, Landis, & Rowe, 1999). This is necessary so that the team members can function as a "we" rather than a "me" (Schwartz, Landis, & Rowe, 1999).

Team Leadership

Team leadership focuses on the direction and structure that is provided by the leaders as well as other team members (Dickinson & McIntyre, 1996). The team leader is responsible for helping the team member focus on the task and achieve the goal (Schwartz, Landis, & Rowe, 1999). Teams may fail either due to the lack of leadership or inappropriate leadership (Koulokov, 1999). A hierarchical system will not allow the team to meet the demands of speed, flexibility, and efficiency (Koulikov, 1999). In an interdisciplinary team, each team member has the opportunity to exert leadership

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regardless of their discipline (Drinka, 1991). Leadership should be negotiated by expertise and commitment (Drinka, 1991). Team member should assume leadership roles when needed and promote leadership skills in others when they are needed ((Drinka & Streim, 1994). Participative leadership by all team members increases their commitment to the team as well as enhances decision-making (Lundy, 1992). The role of the leader can be interchangeable with the role of a facilitator (Koulokov, 1999; Sisco, 1993). In a facilitative role, the leader helps the members share their views openly and constructively, help the team stay on track, makes sure no single person dominates, and empowers the members (Drinka, 1991; Koulokov, 1999).

Monitoring

Monitoring pertains to the tracking of the team's performance and an awareness by the team members of the activities of other team members (Dickinson & McIntyre, 1996). Monitoring implies that each team member is competent in performing their tasks and is aware of the expertise of the other team members (Dickinson & McIntyre, 1996). As a result, the team members are aware when a team member performs well or makes a mistake. Monitoring is predicted to result in reinforcing the activities that went well and making team members aware of areas in need of improvement (Schwartz, Landis, & Rowe, 1999). As a result of monitoring, the team members are predicted to be better able to support each other in accomplishing the goal of the team. Monitoring can result from such activities as observation, discussion, and data collection. Data collection can result in providing the team with information that can reinforce and energize the team members as well as indicate areas of concern (Schwartz, Landis, & Rowe, 1999).

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Feedback

The next component of the Teamwork Model is feedback. Feedback pertains to the giving, seeking, and receiving of information regarding the performance of team members (Dickinson & McIntyre, 1996). Giving feedback refers to providing a team member information about how they are performing. Seeking feedback is when team members request input regarding their performance. Receiving feedback is when a team member receives both positive and negative feedback regarding their performance. The goal of feedback is to help the recipient obtain information that will help them alter their behavior in a positive direction (Lundy, 1992). Feedback should focus on communication, feelings, understanding, attitudes, and cooperation (Lundy, 1992). It should be provided in a calm, sensitive, and constructive manner (Lundy, 1992). Feedback enables the team members to learn and adapt based on their performance. Feedback is a must for teams in that it is the only way members know how they are doing (Lundy, 1992).

Backup Behavior

According to the Teamwork Model, backup behavior is needed to assist with the accomplishment of tasks. Backup behavior occurs when team members help each other perform their tasks (Dickinson & McIntyre, 1996). Some of the tasks team members perform are interchangeable. At times, team members are in situations where they are unable to accomplish a task or where they need assistance in completing the task. In those cases, the team members may require backup. In order to provide backup, the team members must have an understanding of the tasks of other members. They must also be willing to seek and give assistance as needed (Dickinson & McIntyre, 1996). In order for team members to provide feedback, they must have the knowledge, skills, and time to

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perform the duties. They must also have either monitored the performance they need to backup or have been sought out for backup (Dickinson & McIntyre, 1996).

Coordination

The Teamwork Model predicts that a team that is able to coordinate their activities will be more effective and efficient. Coordination is the execution of team activities so that the members work in response to the functions of each other (Dickinson & McIntyre, 1996). As a result of well coordinated activities, the team can achieve much better results than the individual (Lundy, 1992). Successful coordination of activities is the result of the effective operation of the other constructs in the Teamwork Model. These include effective orientation, leadership, monitoring, feedback, and backup (Dickinson & McIntyre, 1996). This results of the activities of the team occurring in a synchronized manner.

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Appendix B

Protocols for the Management of Type 2 Diabetes Mellitus

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Recommendations for Diabetes Care

Each visit

- **Weight**
- **Height**
- **Blood pressure** — **< 130/85**
- **Pulse**
- **Symptoms of hypo/hyperglycemia**
- **Blood glucose control** (review of home monitoring)
  ADA glycemic goals
  -preprandial glucose — **80 - 120 mg/dl**
  -bedtime glucose — **100 – 140 mg/dl**
- **Inspection of feet** (skin, pulses, wounds, infection)
- **Injection sites**
- **Tobacco/ETOH use**
- **Exercise**

Quarterly

HgbA1c (at least 3 times a year)

-ADA guidelines

• 7 % or less	adequate
• < 8 %	acceptable
• > 8 %	take action
• 9 % or greater	serious

Annually

- **Comprehensive exam**
- **Creatinine/creatinine clearance**
- **Urine microalbumin/protein**
- **Complete foot exam**
- **Dilated retinal exam** (report must be in the chart)
- **Lipid profile** (if normal)

-LDL	< 130 mg/dl	
-HDL	> 35 mg/dl	males
	> 45 mg/dl	females
-TG	< 200 mg/dl	

Once (depending on results)

- **C-peptide**
- **ECG**
- **Thyroid function tests**

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Appendix C

Examples of Resource Directory

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Referral Program Information

Referral Address:

06/01/2000

Diabetes Center I Lifestyle Fitness Ctr, Ches. Gen. Hosp.
800 Battlefield Blvd, N.
PO Box 2028
Chesapeake, VA 23327

Program #: SEVA0220F

Telephones: (757) 312-6132 Main
(757) 312-6245 Fax

Operating Agency: Chesapeake General Hospital

Person in charge: Nancy Clark, RN, CDE **Title:** Coordinator

Hours: 8:30AM-5:00PM, Mon-Fri

Languages: English.

Fees: Charges dependent upon level of service/counseling.

Intake Procedure: Telephone referral; appointment required.

Eligibility Requirements: Unrestricted.

Area Served: Chesapeake, Norfolk, Suffolk, Virginia Beach, and Northeastern North Carolina.

Program Details: Provides education by Certified Diabetes Nurse Educator and Nutritionist through individual counseling sessions, group classes and follow-up visits. Occasional seminars offered with special speakers on diabetes-related topics. Monthly "Living with Diabetes" classes offered free of charge.

Info. provided by: Doris Biddix, Office Manager (757) 312-6132.

Method of payment: Cash, check, credit card (VISA or MC); money order.

Credentialing Body:

Client/Staff Ratio:

Length of Stay:

Prog. Frequency:

[ ] Handicap parking
[X] Not applicable

[ ] Open field = prog provided no data
[X] Wheelchair Accessible
[ ] Accessible by Bus
[X] Provides Client Transportation

Gender of MD:

[X] Use in SN database
[ ] Don't list-Statewide

Capacity: 0

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Appendix D

Invitation to Diabetes Didactic Session

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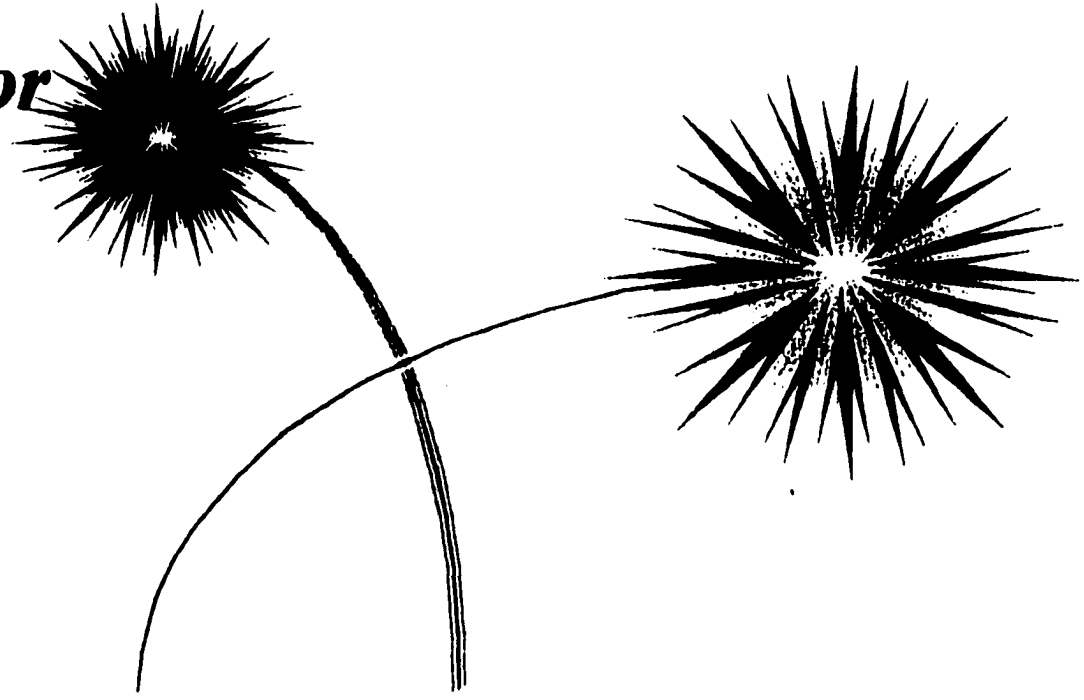
Can we enhance our diabetes care?



Some strategies for system changes

Presented by:

Dr. Eng

Dr. Bluestein

O. Palsson, PhD

Dr. Crabtree *Oct. 29* *12:30-2:00*

Carolyn Rutledge, CFNP *or*

Rita Klahr, CFNP *Nov. 1* *12:30-2:00*

Lynn Earle-Cookson, RD

Appendix E

Patient Chart Audit

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ID #_____

PATIENT DEMOGRAPHIC DATA

Chart Audit Pretest

1. Where does patient receive Medical Care? 1. GFP 2. PFM
2. Length of time as patient at GFP or PFM:_____years
3. Patient's phone number:_____
4. Is there any documentation of Dementia, Alzheimer's or other problem which affects their ability to comprehend? 1. Yes 2. No
5. Age:_____
6. Gender: a. Male b. Female
7. Insurance Carrier (Circle all that apply):
    1. Medicare A
    2. Medicare B
    3. Private Insurer
    4. Managed Care
    5. Medigap Private
    6. Medicaid
    7. Other:_____
8. Zip Code:_____
9. Height:_____Inches
10. Weight:_____Pounds
11. BP:_____Systolic_____Diastolic
12. Number visits in last year (12 months):_____for NIDDM _____other
13. Most recent HgA1c:_____level _____Month _____Year
14. Microalbuminuria:_____level _____Date
15. 24 hour urine - total protein:_____level_____Date
    Creatinine clearance:_____level_____Date
16. Lipid Profile:_____Date
    _____Total Cholesterol
    _____Fasting Triglycerides
    _____Fasting LDL
    _____HDL

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ID #_____

17. Home glucose monitoring:_____levels _____Date reviewed

18. Date of last diet review:_____

19. Date of last Cardiovascular exam by Primary care provider:_____

20. Date of last foot exam:_____

Problems: 1. No 2. Yes, What?_____

21. Date of last dilated eye exam:_____

Problems: 1. No 2. Yes, Explain:_____

22. Other Medical Conditions:
1. Hypertension
2. Congestive Heart Failure
3. Arthritis
4. _____
5. _____

23. Overall level of documentation:
1. Poor
2. Fair
3. Average
4. Good
5. Excellent

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ID #_____

Chart Audit Posttest

1. Insurance Carrier (Circle all that apply):
    1. Medicare A
    2. Medicare B
    3. Private Insurer
    4. Managed Care
    5. Medigap Private
    6. Medicaid
    7. Other:_____
2. Weight:_____Pounds
3. BP:_____Systolic_____Diastolic
4. Number visits in last six months:_____for NIDDM _____other
5. Most recent HgA1c:_____level _____Month _____Year
6. Microalbuminuria:_____level _____Date
7. 24 hour urine - total protein:_____level_____Date
   Creatinine clearance:_____level_____Date
8. Lipid Profile:_____Date
   _____Total Cholesterol
   _____Fasting Triglycerides
   _____Fasting LDL
   _____HDL
9. Home glucose monitoring:_____levels _____Date reviewed
10. Date of last diet review:_____
11. Date of last Cardiovascular exam by Primary care provider:_____
12. Date of last foot exam:_____
    Problems: 1. No 2. Yes, What?_____
13. Date of last dilated eye exam:_____
    Problems: 1. No 2. Yes, Explain:_____
14. Other Medical Conditions: 1. Hypertension
    2. Congestive Heart Failure
    3. Arthritis
    4. _____

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ID #_____

15. **Overall level of documentation:** 1. **Poor**
2. **Fair**
3. **Average**
4. **Good**
5. **Excellent**

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Appendix F

Diabetes Flow Sheet

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	Annual assessment	Additional assessments- 3 times per year		
DATE	/ /	/ /	/ /	/ /
Weight				
Blood Pressure/pulse	/	/	/	/
Health Rating	Excellent Good Fair Poor	Excellent Good Fair Poor	Excellent Good Fair Poor	Excellent Good Fair Poor
Home Glucose Review				
Diet/Exercise Review				
Medication(s)				
Eye/Fundiscopic Exam				
Cardiovascular Exam				
Peripheral pulses				
Foot exam/monofilament				
Hemoglobin A1C				
Serum Creatinine				
ALT/AST				
Total Cholesterol				
HDL				
LDL				
Triglycerides				
Urine Mircoalbumin				
24hr Urine protein/creat.				
BDI Score				
Tobacco cessation rec				
DM classes recommended				
Ophthalmology Eval.				
Podiatry Care				
Nutrition Consult				
Diabetes Educator Consult				

Name:_____ **Diabetes Flow Sheet** Ghent Chart #_____

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Appendix G

Diabetes Newsletter

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DIIG NEWS

Diabetes Interdisciplinary Interest Group

Volume 1, Issue 1
December, 1999

Editor:
Lynn Earle-Cookson, MPH, RD, CDE
Health Promotion and Nutrition Consultant

Contributors:
Dan Bluestein, MD, MS, Professor
Rita Klahr, RN, FNP, CDE, Nurse Practitioner
Laura Killeen, BS, Database Manager

DIIG Kick Off Presentations Generate

In early November, the DIIG (Diabetes Interdisciplinary Interest Group) provided overviews of their recent activities and future program plans. A Diabetes flow sheet, developed by Drs. Eng and Crabtree was introduced and is now being incorporated into patients' charts. A CD-ROM resource directory has been purchased and will be available (see related article). Ideas were collected for on-going educational activities. Collaboration with the Diabetes Institute will provide for more standardized and current teaching materials for patients. A series of classes will be offered for patients with Type 2 Diabetes beginning in January, 2000. The four week series will be held from 10:00 am to 12:00 noon on Tuesday mornings, beginning January 18, 2000. The focus of the series will be quality of life, patient self-advocacy and empowerment, patient knowledge, peer support, lifestyle change and psychosocial issues. In the first session, an assessment of each participants status will be completed. In the second session, the focus will be on patient-partnering with the health care provider. Session 3 will focus on motivation, behavior, goal-setting and life-style modification. The fourth session will focus on stress management. A final follow-up well be held 3-4 months later to reassess and reinforce.

Resource Directory Soon to Be Available

The Community Compass Directory allows rapid location of Service Programs and Agencies that are available in the Tidewater Area. The program uses a keyword search to locate various programs. Searches can also by made by specific agency or program name, city, zip code and geographical area. Once a subject or keyword is entered, the program will give an extensive list of available programs pertaining to that keyword. The program listing will include service details, address, telephone number, hours, fees, operating agency and person in charge. In addition, the languages spoken, intake procedure, service area and eligibility requirements are displayed.

Using the keywords diabetes classes, diabetes management and diabetes screening, The directory provides information pertaining to over 50 resources available in Hampton Roads. The directory is not limited to diabetes; there are many other types of information and referral services. This is a compact, easy to use system. It can assist health care providers in finding necessary resources in their community for their patients.

- Laura Killeen

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Appendix H

Questionnaires for Patient Education Classes

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NAME. _____ TODAY'S DATE. _____

Please circle one number on the scale below to indicate *HOW STRESSFUL* your life has been over the *PAST MONTH*.

10 EXTREMELY STRESSFUL - MORE THAN I CAN HANDLE
9
8
7
6
5 MODERATELY STRESSFUL
4
3
2
1
0 NOT STRESSFUL AT ALL

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SELF-EVALUATION QUESTIONNAIRE

Developed by Charles D. Spielberger
in collaboration with
R. L. Gorsuch, R. Lushene, P. R. Vagg, and G. A. Jacobs

STAI Form Y-1

Name _____ Date _____ S

Age _____ Sex: M ___ F ___ I

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

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SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name _____ Date _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

21.	I feel pleasant			
22.	I feel nervous and restless			
23.	I feel satisfied with myself			
24.	I wish I could be as happy as others seem to be			
25.	I feel like a failure			
26.	I feel rested			
27.	I am calm, cool, and collected			
28.	I feel that difficulties are piling up so that I cannot overcome them			
29.	I worry too much over something that really doesn't matter			
30.	I am happy			
31.	I have disturbing thoughts			
32.	I lack self-confidence			
33.	I feel secure			
34.	I make decisions easily			
35.	I feel inadequate			
36.	I am content			
37.	Some unimportant thought runs through my mind and bothers me			
38.	I take disappointments so keenly that I can't put them out of my mind			
39.	I am a steady person			
40.	I get in a state of tension or turmoil as I think over my recent concerns and interests			

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Appendix I

Diabetes Tracking Card

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Medication	Dosage	Time

Allergies _____

I Have Diabetes

- If I am acting strangely or cannot be awakened, my blood sugar may be low.
- If I can swallow, give me 4 to 6 ounces of a sweetened soft drink, fruit juice or other sugar source.
- If I do not recover within 10 to 15 minutes, repeat the above. Call a doctor or send me to a hospital.
- If I cannot be awakened or cannot swallow, do not try to give me anything by mouth. Call a doctor and send me to a hospital **right away.**

Help others help you by wearing MedicAlert® identification. 1-800-763-3429

SENTARA

DIABETES OWNER'S MANUAL

My Personal Diabetes Care Card

Name _____ Ph ( ) _____

Doctor _____ Ph ( ) _____

Nurse _____ Ph ( ) _____

Dietitian _____ Ph ( ) _____

Other _____ Ph ( ) _____

Take this card to your doctor when you visit every three months so YOU can take charge of your diabetes.

TESTS (how often)	DATE OF VISIT			
HbAlc every 6 mos.				
Weight every visit				
Foot Exam every visit				
Blood Pres. every visit				
Cholesterol yearly				
Urine Micro yearly				
Eye exam yearly				
Dental Exam yearly				
DISCUSS WITH DR.				
Meal Plan				
Blood Sugar Testing				
Foot Care				
Exercise Plan				
Sick Day Plan				

DO EVERY DAY:
- Check my glucose level.
- Take diabetes medicine as prescribed.
- Meals, snacks on regular schedule (AVOID sugar, fats, salt).
- Eat 5 servings of vegetables or fruits.
- Exercise at least 20 minutes walk, stretch, swim (check with your doctor).
- Floss and brush your teeth. Inspect your feet.
- Avoid smoking.

DO EVERY 3-4 MONTHS:
- **Visit health care provider.**
- **Review blood glucose results.**
- **Discuss problems with high or low blood sugar, illness, weight or stress.**
- **Have health care provider inspect your feet.**
- **Review goals for care with health care provider.**
- Identify one change you can make to improve.

DO EVERY 6 MONTHS:
- Have HgbAlc checked (more often if therapy changes)

DO EVERY YEAR:
- Have blood cholesterol and triglycerides checked.
- Have urine measured for protein to check for kidney disease.
- Visit an eye doctor for a dilated eye exam.
- Visit the dentist.
- Have a complete physical exam.
- Ask your health care provider how you can lower the risk of complications.

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Appendix J

Interview of Team Members

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INTERVIEW OF TEAM MEMBERS

1. Did you feel the diabetes team was a success?
   1. Yes
   2. No

2. What did you think was successful about the team?_____

3. What did you feel did not work well with the team?_____

4. What did you feel helped the team function?_____

5. What barriers did you feel the team encountered?_____

6. What do you think would have helped the team function better?_____

7. How would you describe your role with the team?_____

8. How did others contribute to the team?_____

9. How did other roles you have impact how you functioned on the team?_____

10. Do you think things would have gone better individually as opposed to as a team?
    1. Yes
    2. No

11. How was a database utilized in the programs?_____

12. What were the benefits to each program?_____

13. What were the barriers to each program?_____

14. Why do you think trends occurred?_____

15. What thoughts do you have about improving the team?_____

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Appendix K

Teamwork Scale

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TEAMWORK SCALE

	Yes	No
(1) Does your team include two or more people?		
(2) Do team members need to interact with each other in order to accomplish the team task?		
(3) Do all team members share a common and valued goal or mission?		
(4) Does each team member have a specific role or function?		
(5) Is team membership temporary? Do team members have a limited term of membership?		
(6) Do team members engage in the frequent exchange of information or resources?		
(7) Do team members have to time or coordinate their activities so that they can work together?		
(8) Are team members constantly adjusting to the demands or requirements of their task or goal?		
(9) Do team members depend upon each other? (a) Do team members need to communicate with each other or (b) Do team members need to anticipate the actions of each other?		

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Almost Never		Sometimes		Almost Always
1	2	3	4	5

Write "N/A" if a behavior does not apply

Communication: Communication involves the exchange of information between two or more team members in the prescribed manner and by using proper terminology. Often the purpose of communication is to clarify or acknowledge the receipt of information.

Team Members:

	Clarify intentions to other team members.
	Clarify procedures in advance of assignments.
	Pass complete information as prescribed.
	Acknowledge and repeat messages to ensure understanding.
	Communicate with proper terminology and procedures.
	Verify information prior to making a report.
	Ask for clarification of performance status when necessary.
	Follow proper communication procedures in passing and receiving information.
	Ensure that members who receive information understand it as it was intended to be understood.
	Communicate information related to the task.
	Discuss task-related problems with others.

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Almost Never	Sometimes	Almost Always
1	2 3 4	5

Write "N/A" if a behavior does not apply

Team Orientation: Team Orientation refers to the attitudes that team members have toward one another and the team task. It reflects an acceptance of team norms, level of group cohesiveness, and importance of team membership.

Team Members:

	Willingly participate in all relevant aspects of the team.
	Cooperate fully with one another.
	Pull together and place team goals ahead of their personal goals and interests.
	Display a high degree of pride in their duties and the team.
	Display a high degree of trust among one another.
	Display an awareness that they are part of a team and that teamwork is important.
	Assign high priority to team goals.
	Display willingness to rely on other team members.
	Get along with other team members.
	Enjoy working with other team members.
	Feel that team experience is personally satisfying.
	Feel proud of personal contributions to team output.
	Regard other team members in a positive way.
	Feel close to other team members.
	Do helpful things for other members of the team.

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Almost Never		Sometimes		Almost Always
1	2	3	4	5

Write "N/A" if a behavior does not apply

Team Orientation: Team Orientation refers to the attitudes that team members have toward one another and the team task. It reflects an acceptance of team norms, level of group cohesiveness, and importance of team membership.

Team Members:

	Unify with other members in pursuit of team goals.
	Feel that accomplishment of team goals is important.
	Agree with other members about importance of team goals.
	Are able to work with other members to achieve optimal performance.
	Find it easy to accomplish tasks in the company of other team members.

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Almost Never		Sometimes		Almost Always
1	2	3	4	5

Write "N/A" if a behavior does not apply

Team Leadership: Team Leadership involves providing direction, structure, and support for other team members. It does not necessarily refer to a single individual with formal authority over others. Team leadership can be shown by several team members.

Team Members:

	Encourage other members to make decisions on their own.
	Work with other members to develop communication methods and areas of responsibility.
	Explain to other team members exactly what is needed from them during an assignment.
	Review the situation quickly when the team becomes overwhelmed and take action.
	Ensure that other members are working up to capacity.
	Ask other members to follow standard procedures.
	Stress the importance of meeting deadlines.
	Strive to maintain definite performance standards.
	Give consideration to the needs of other members, especially subordinates.
	Provide encouragement when other members attempt to meet new challenges.
	Are willing to listen to problems/complaints of other members.
	Show concern for the welfare of other team members, especially subordinates.

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Almost Never	Sometimes	Almost Always
1	2 3 4	5

Write "N/A" if a behavior does not apply

Team Leadership: Team Leadership involves providing direction, structure, and support for other team members. It does not necessarily refer to a single individual with formal authority over others. Team leadership can be shown by several team members.

Team Members:

	Strive to create a friendly team environment.
	Provide needed support for new members.
	Listen to the concerns of other team members.
	Assign experienced members to perform critical tasks.
	Assign extra work only to the more capable members.
	Find someone to fill in for them when leaving work.

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Almost Never		Sometimes		Almost Always
1	2	3	4	5

Write "N/A" if a behavior does not apply

Monitoring: Monitoring refers to observing the activities and performance of other team members. It implies that team members are individually competent and that they may subsequently provide feedback and backup behavior.

Team Members:

	Are aware of other team members' performance.
	Are concerned with the performance of the team members with whom they interact closely.
	Make sure other team members are performing appropriately.
	Recognize when a team member makes a mistake.
	Recognize when a team member performs correctly.
	Notice the behavior of others.
	Discover errors in the performance of another team member.
	Watch other team members to ensure that they are performing according to guidelines.
	Notice which members are performing their tasks especially well.

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Almost Never	Sometimes	Almost Always
1	2 3 4	5

Write "N/A" if a behavior does not apply

Feedback: Feedback involves the giving, seeking, and receiving of information among members. Giving feedback refers to providing information regarding other members' performance. Seeking feedback refers to requesting input or guidance regarding performance. Receiving feedback refers to accepting positive and negative information regarding performance.

Team Members:

	Respond to other members' requests for performance information.
	Accept time-saving suggestions offered by other team members.
	Explain terminology to a member who does not understand its meaning.
	Ask the supervisor for input regarding their performance and what needs to be worked on.
	Are corrected on a few mistakes, and incorporate the suggestions into their procedures.
	Use information provided by other members to improve behavior.
	Ask for advice on proper procedures.
	Provide helpful suggestions to other members.
	Provide insightful comments when an assignment does not go as planned.

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Almost Never		Sometimes		Almost Always
1	2	3	4	5

Write "N/A" if a behavior does not apply

Backup Behavior: Backup Behavior involves assisting the performance of other team members. This implies that members have an understanding of other members' tasks. It also implies that members are willing and able to provide and seek assistance when needed.

Team Members:

	Fill in for another member who is unable to perform a task.
	Seek opportunities to aid other team members.
	Help another member correct a mistake.
	Provide assistance to those who need it when specifically asked.
	Step in for another team member who is overburdened.
	Take control of situation when other team members do not know how to perform.
	Solve a problem posed by another team member.
	Ask for help when needed.
	Maintain their own duties in the process of helping others.

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Almost Never	Sometimes	Almost Always
1	2 3 4	5

Write "N/A" if a behavior does not apply

Coordination: Coordination refers to team members executing their activities in a timely and integrated manner. It implies that the performance of some team members influences the performance of other team members. This may involve an exchange of information that subsequently influences another member's performance.

Team Members:

	Complete individual tasks without error, in a timely manner.
	Pass performance-relevant data from one to another in an efficient manner.
	Are familiar with the relevant parts of other members' jobs.
	Facilitate the performance of each other.
	Carry out individual tasks in synchrony.
	Cause each other to work effectively.
	Avoid distractions during critical assignments.
	Carry out individual tasks effectively thereby leading to coordinated team performance.
	Work together with other members to accomplish team goals.

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Appendix L

Diabetes Program Evaluation

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Diabetes Program Evaluation

Directions: Over the past year the diabetes team has provided several programs to improve the care of patients with diabetes. We need your feedback on the programs. Please fill in the blanks or circle the appropriate answers.

1. **Diabetes didactic sessions.**

   A. Did you attend the didactic sessions on diabetes? a. No b. Yes
   (If no, skip to questions E and F.)

   B. How helpful were they?
   a. Very helpful
   b. Somewhat helpful
   c. Not very helpful
   d. Not helpful at all

   C. Did you change the way you care for patients with diabetes based on the didactic sessions?
   a. Very much
   b. Some
   c. Not very much
   d. Not at all

   D. What were the benefits to the sessions?_____
   _____
   _____

   E. What were barriers to attending the sessions or making changes based on the information provided in the didactic sessions?_____
   _____
   _____

   F. What are some suggestions you have regarding improving the didactic sessions on diabetes?_____
   _____
   _____

2. **The diabetes flowsheet.**

   A. Did you use the diabetes flowsheet?
   a. With all diabetes patients
   b. With most of my diabetes patients
   c. With a few of my diabetes patients
   d. With none of my patients

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B. How helpful were they?
   a. Very helpful
   b. Somewhat helpful
   c. Not very helpful
   d. Not helpful at all

C. Did you change the way you care for patients with diabetes based on the flowsheets?
   a. Very much
   b. Some
   c. Not very much
   d. Not at all

D. What were the benefits to the flowsheets?_____
_____
_____

E. What were barriers to using the flowsheets?_____
_____
_____

F. What are some suggestions you have regarding improving or changing the use of the flowsheet?_____
_____
_____

3. **Resource Directory.**

A. Did you know that there is a computerized resource directory available for your use with patients?
   a. Yes
   b. No

(If no, skip to questions F and G)

B. Did you use the resource directory?
   a. With most of my patients
   b. With some of my patients
   c. With a few of my patients
   d. With none of my patients

(If you answer is "d," then skip to questions F and G)

C. How helpful was the resource directory?
   a. Very helpful
   b. Somewhat helpful
   c. Not very helpful
   d. Not helpful at all

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D. Did you change the way you care for your patients based on the resource directory?
   a. Very much
   b. Some
   c. Not very much
   d. Not at all

E. What were the benefits to the resource directory?_____
_____
_____

F. What were barriers to using the resource directory?_____
_____
_____

G. What are some suggestions you have for improving the use of the resource directory?
_____
_____

4. Newsletter.

A. Did you read the newsletter? a. All of it
   b. Most of it
   c. Some of it
   d. None of it

(If you answered "d," skip to question D)

B. How helpful was the diabetes newsletter?
   a. Very helpful
   b. Somewhat helpful
   c. Not very helpful
   d. Not helpful at all

C. Did you change the way you care for patients with diabetes based on the newsletter?
   a. Very much
   b. Some
   c. Not very much
   d. Not at all

D. What were the benefits to the newsletter?_____
_____
_____

E. What are some suggestions you have regarding improving or changing the newsletter?_____
_____

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5. Patient Education material (Rita's file cabinet)

A. Did you use the diabetes patient education materials?

a. With all diabetes patients
b. With most of my diabetes patients
c. With a few of my diabetes patients
d. With none of my patients

(If you answered "d," then skip to question E and F)

B. How helpful were they?

a. Very helpful
b. Somewhat helpful
c. Not very Helpful
d. Not helpful at all

C. What were the benefits to the patient education materials?_____
_____
_____

D. What were barriers to using the patient education materials?_____
_____
_____

F. What are some suggestions you have regarding improving or changing the use of the patient education materials?_____
_____
_____

6. Diabetes Classes for patients with diabetes.

A. Did you know that there are classes for patients with diabetes?

a. Yes
b. No

B. Did you refer patients to the classes?

a. Most of my patients
b. Some of my patients
c. A few of my patients
d. None of my patients

(If you answered "d", then skip to items F and G)

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C. How helpful do you think the diabetes classes are?

a. Very helpful
b. Somewhat helpful
c. Not very helpful
d. Not helpful at all

D. Did you change the way you care for your patients based on the diabetes classes?

a. Very much
b. Some
c. Not very much
d. Not at all

E. What were the benefits to the diabetes classes?_____

_____

_____

F. What were barriers to using the diabetes classes?_____

_____

_____

G. What are some suggestions you have for improving the use of the diabetes classes?

_____

_____

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Appendix M

Consent Form and Questionnaire Packet for Provider Survey

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Consent Form-Version 1

Title: Interdisciplinary Team Approach to Geriatric Care
Investigators Names: Carolyn M. Rutledge, MS, CFNP, Daniel A. Bluestein, MD, Rita Klahr, MS, FNP

Description: I am being asked to participate in a research project involving the collection of information in the form of a questionnaire. The purpose of the research project is to gather data in order to develop, implement, and evaluate programs on caring for elderly patients with diabetes. Completion of the questionnaire will require approximately 15 minutes of my time.

Risks & Benefits: I understand that there are no specific risks related to my participation, but there may be other risks not yet identified. I may benefit from the knowledge that I will receive from the programs developed to manage elderly patients with diabetes. Although the results of this research may not benefit me directly, they may be made available upon request.

Confidentiality: Data collected during the research will be confidential and any publication resulting from this research will not personally identify me. In addition, I understand that I may terminate my participation at any time.

Reimbursement: I understand that I will not be reimbursed for my participation.

Compensation: I also understand that, in the event of injury resulting from this research procedure, immediate medical treatment will be available to me. I am aware, however, that the Eastern Virginia Medical School of the Medical College of Hampton Roads (EVMS) provides no financial compensation plan or free medical care. If I believe that I have suffered a research related injury as a result of my participation in any research program, I may contact Dr. Pauline Newlon, (757) 446-8423, an employee of EVMS, who will review the matter with me.

Voluntary Consent: If I have any questions pertaining to the research, I may contact Carolyn M. Rutledge, MS, CFNP, Daniel A. Bluestein, MD, or Rita Klahr, MS, FNP at 446-7461. If I have any questions pertaining to my rights as a research subject I may contact Dr. James Shaeffer, a member of the Institutional Review Board at (757) 446-8423. I certify that my decision to take part in this research project is voluntary and that I consent to participate in the research project. I will be given a copy of this consent form.

_____ _____
Signature of Participant Date

_____ _____
Signature of Witness Date

I certify that I have explained to the above individual the nature and purpose of the study, potential benefits, and possible risks associated with participation in this study. I have answered any questions that have been raised and have witnessed the above signature. I have explained the above to the volunteer on the date stated on this consent form.

_____ _____
Signature of Investigator Date

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EMPLOYEE/STUDENT ADDENDUM CONSENT FORM

STUDY TITLE Interdisciplinary Team Approach to Geriatric Care

SUBJECT Faculty & Residents INVESTIGATOR Carolyn M. Rutledge, MS, CFNP, Daniel Bluestein, MD, Rita Klahr, MS, FNP

I understand that I am being asked to participate in the above research study which is being conducted at Eastern Virginia Medical School of the Medical College of Hampton Roads (EVMS), where I am an employee or student. The research study has been described to me, in writing, on the attached consent form. I have also had the opportunity to ask the investigators conducting this study any questions that I may have regarding participation in this study

The purpose of this addendum consent form is to inform me that I have the right to choose not to participate in this research study If I choose not to participate, or to withdraw at any time, it will not affect my standing as an employee or student.

If I am an employee, I understand that my participation will not place me in good favor with the investigator, my supervisor, or EVMS (e.g., increase in salary, promotion, extra vacation, or the like). I also understand that my not participating will not adversely affect my employment with EVMS, in particular the position that I currently hold.

If I am a student, I understand that participating will not place me in good favor with the investigator or other faculty (e.g., receiving better grades, recommendations, employment). Also, I understand that not participating in this study will not adversely affect my relationship with the investigator or other faculty

I understand that if I suffer a physical injury or illness as a result of participating in this research study that I will not receive a financial payment. Treatment for such injury or illness is not covered under Workmen's Compensation. Any immediate emergency medical treatment I may need as a result of participating in this study will be provided as outlined in the attached consent form.

The Eastern Virginia Medical School provides no compensation plan or free medical care plan to compensate me for such injuries. If I believe that I have suffered an injury as a result of my participation in any research program I may contact Dr. Pauline Newlon, (757) 446-8423, an employee of EVMS, who will review the matter with me. I can also discuss any other concerns I may have as a result of participating in this study Any discussion that I have with Dr. Newlon will be kept strictly confidential.

My signature below means that I have read the attached subject consent form, as well as this addendum, and freely agree to participate in this study

SIGNATURE OF EMPLOYEE/STUDENT _____ Date _____

SIGNATURE OF WITNESS _____ Date _____

I have answered any questions that have been raised and have witnessed the above signature. I also certify that if this employee/student chooses not participate or withdraws from this study it will not adversely affect their relationship with the investigators.

SIGNATURE OF INVESTIGATOR _____ Date _____

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Provider Demographic Data Sheet

Please circle the answer that best applies to your situation. Fill in the blanks as indicated.

1. Which of the following apply?
   1. Faculty
   2. Third-year resident
   3. Second-year resident
   4. First-year resident

2. Gender:
   1. Male
   2. Female

3. How do you feel you function best?
   1. On a team with two or more other people
   2. Partnered with one other person
   3. Individually

4. How many of your diabetic patients over 55 years of age do you refer to the following resources? (Circle all that apply).

	None	Few	Some	Most	Almost all	No knowledge about
Diabetes Support Group	1	2	3	4	5	0
Nutritional Support Group	1	2	3	4	5	0
Diabetes Education Class	1	2	3	4	5	0
Exercise Class	1	2	3	4	5	0
Transportation Assistance	1	2	3	4	5	0
Elder Support Group	1	2	3	4	5	0
Adult Day Care	1	2	3	4	5	0
Home Delivered Meals	1	2	3	4	5	0
_____	1	2	3	4	5	0
_____	1	2	3	4	5	0

5. For how many of your diabetic patients over age 55 do you consult with the following nonphysicians? (Circle all that apply).

	None	Few	Some	Most	Almost all	Not Worthwhile
Nutritionist	1	2	3	4	5	0
Psychologist	1	2	3	4	5	0
Diabetes Educator	1	2	3	4	5	0
Social Worker	1	2	3	4	5	0
Home Health Nurse	1	2	3	4	5	0
Alternative Med Practitioner	1	2	3	4	5	0
Chiropractor	1	2	3	4	5	0
Therapist (Physical, Speech)	1	2	3	4	5	0
_____	1	2	3	4	5	0
_____	1	2	3	4	5	0

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6. How many of your diabetic patients over age 55 do you refer to the following specialists? (Circle all that apply).

	None	Few	Some	Most	Almost all	Not Worthwhile
Podiatrist	1	2	3	4	5	0
Nephrologist	1	2	3	4	5	0
Cardiologist	1	2	3	4	5	0
Endocrinologist	1	2	3	4	5	0
Ophthalmologist	1	2	3	4	5	0
_____	1	2	3	4	5	0
_____	1	2	3	4	5	0
_____	1	2	3	4	5	0

7. Have you ever participated on a team (working group of 2 or more people) in the DFCM?

1. Yes 2. No

If yes, what team(s) or workgroups?

8. What were the good factors about the working on a team or with a working group?

9. What were problems with working on a team or with a working group?

10. What do you see as barriers to successful teams or working groups in the DFCM?

11. What suggestions do you have for creating successful teams or working groups in the DFCM?

12. In what areas do you feel the DFCM could benefit from teams or working groups?

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13. Which of the following groups have you worked with?

Work Group	Check if Yes	Rate your comfort level 1=no comfort, 5=comfortable	Rate Efficiency 1= not efficient, 5=efficient
Executive Board			
Clinical Teams			
Residency Review			
Morning Report			
Town Meetings			
Provider Meetings			
Residency Meetings			
Practice Committees			
Departmental Mtg			

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The Geriatrics Attitudes Scale

Directions: Please use the scale to indicate the degree to which you agree with each statement. There are no right or wrong answers. The best response is the one that truly reflects your personal opinion. Findings of this study will be reported only on a group basis with no individual names identified. "Old People" and "elderly patients" mentioned in the questions refer to persons aged 55 or older.

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
1. Most old people are pleasant to be with.	1	2	3	4	5
2. The federal government should reallocate money from Medicare to research on AIDS or pediatric disease.	1	2	3	4	5
3. If I have the choice, I would rather see younger patients than elderly ones.	1	2	3	4	5
4. It is society's responsibility to provide care its elderly persons.	1	2	3	4	5
5. Medical care for old people uses up too much human and material resources.	1	2	3	4	5
6. As people grow older, they become less organized and more confused.	1	2	3	4	5
7. Elderly patients tend to be more appreciative of the medical care I provide than are younger patients.	1	2	3	4	5
8. Taking a medical history from elderly patients is frequently an ordeal.	1	2	3	4	5
9. I tend to pay more attention and have more sympathy towards my elderly patients than my younger patients.	1	2	3	4	5
10. Old people in general do not contribute much to society.	1	2	3	4	5
11. Treatment of chronically ill old patients is hopeless.	1	2	3	4	5
12. Old persons don't contribute their fair share towards paying for their health care.	1	2	3	4	5
13. In general, old people act too slow for modern society.	1	2	3	4	5
14. It is interesting listening to old people's accounts of their past experiences.	1	2	3	4	5

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INTERDISCIPLINARY COLLABORATION SCALE (ICS)

Directions: Please circle the number which corresponds with how you feel about each statement. Answer each question for each discipline listed.

1 = Strongly Agree	4 = Slightly Disagree
2 = Moderately Agree	5 = Moderately Disagree
3 = Slightly Agree	6 = Strongly Disagree

	Nurse Practitioner	Psychologist	Social Worker	Nutritionist
1. I feel this discipline has much to offer patients.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
2. I feel I should work closely with this discipline in my practice.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
3. I feel patient needs can be met more effectively by a physician than this discipline.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
4. I feel comfortable collaborating with this discipline.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
5. I feel I understand how to work with this discipline.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
6. I feel that this discipline threatens my job security.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
7. I feel that this discipline duplicates what I will do as a physician.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
8. I feel this discipline is well received by patients.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
9. I feel this discipline is important in the care of chronic patients.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
10. I feel I understand the role of this discipline..	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
11. I feel I can develop a mutually acceptable practice with this discipline.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
12. I feel this discipline is potential competition to physicians.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
13. I feel this discipline provides quality patient care.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
14. I feel this discipline should be supervised by a physician.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6

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	Nurse Practitioner	Psychologist	Social Worker	Nutritionist
15. I feel I am likely to disagree with how people in this discipline should do their job.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
16. I feel I will be frustrated working with this discipline.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
17. I feel it will be difficult for me to work with this discipline.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
18. I feel I will be comfortable with my patients seeing this discipline.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
19. I feel I will enjoy working with this discipline.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
20. I feel this discipline is flexible in meeting the need of the practice where they are employed.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
21. I feel this discipline adjusts well to change.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
22. I feel this discipline will augment my practice.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
23. I feel this discipline is very important to the healthcare field.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
24. I feel I would be likely to seek the assistance of this discipline.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
25. I feel I would resist recommendations made by this discipline if they differed from mine..	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6

Directions. Please fill in the following blanks.

1. What are some of the things you like about each discipline?

a. Nurse Practitioner: _____

_____

b. Psychologist: _____

_____

c. Social Worker: _____

_____

d. Nutritionist: _____

_____

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2. What are some of the things you dislike about each discipline?

   a. Nurse Practitioner: _____

   _____

   b. Psychologist: _____

   _____

   c. Social Worker: _____

   _____

   d. Nutritionist: _____

   _____

3. What other disciplines would you consider working with?

   _____

   _____

   _____

4. Is there anything else I should have asked you about these topics?

   _____

   _____

   _____

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Appendix N

Revisions to Provider Questionnaire

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Adjustments to Researcher-Developed Provider Questionnaire

1. A question was added on gender (#2).

2. A response category was added to the questions (#4) on referring to resources that stated "No Knowedge About."

3. A response category was added to the questions (#5) on referrals to nonphysicians that stated "Not Worthwhile."

4. A response category was added to the questions (#6) on referrals to specialists that stated "Not Worthwhile."

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Appendix O

Cover Sheet and Questionnaire Packet for Patient Interview

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Instructions and Script for Geriatric Patient Phone Interview
for study on "Interdisciplinary Team Approach to Geriatric Care"

Principle Investigator: Carolyn M. Rultedge, MS, CFNP
Co-investigators: Daniel Bluestein, MD & Rita Klahr, MS, FNP
Version 1, February 1999

Instructions

You will call the patients who have met the inclusionary criteria for the study, "Interdisciplinary Team Approach to Geriatric Care." You will follow the script as it is written and ask the questions as they are written. As the patient answers each question, record their response on the answer sheet. Please read and repeat the question for the patient. Tell the patient to answer the question based on what they think the question means. If a person gets off track, reorient them after they have finished the story they are telling. Thank the patient for participating in the study. Inform them that they will be called again in about 6 months to complete the same questionnaires.

Script

Hello. May I speak with _____ *(Once the patient is on the phone, proceed).* Hi. I am *(Your Name).* I am a *(State your Profession)* with Ghent Family Practice (or Portsmouth Family Medicine) where you go for your medical care. I am working with several providers there on a research project to develop and evaluate programs on caring for diabetic patients. After reviewing your chart, you were identified as one of our patients with diabetes. We are in the process of interviewing our diabetic patients to find out about your health, what programs you have participated in and how you feel about the care you have received. We need for you to answer a few questions for us. The questions are simple to answer. There are no right or wrong answers. You should choose the response that best represents the way you feel or what you believe to be true. The interview should take about 15 minutes to complete. Is this a good time to talk? *(If it is not, ask the patient when you can call back).*

If the timing is OK then ***Proceed with the questionnaires***

Thank you for your help with this study. Do you have any questions? *(respond to questions).*

If you have any questions at a later time pertaining to the research, you may contact Carolyn M. Rutledge, CFNP or Dr. Dan Bluestein at (757) 446-7461. I look forward to talking with you in about six months.

I certify that I have explained to the above individual the nature and purpose of the study. I have answered any questions that have been raised. I have explained the above to the volunteer on the date stated on this consent form.

_____ _____

Signature of Interviewer Date

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Patient Interview-Pretest

1. Length of time diagnosed with diabetes:_____years

2. Which of the following type of physicians have you received care from in the past year (since Christmas of 1997)? *(Read each item and what's in parenthesis to patient and circle their response).*

a.	Podiatrist (foot doctor)	1. No	2. Yes
b.	Nephrologist (kidney doctor)	1. No	2. Yes
c.	Cardiologist (heart doctor)	1. No	2. Yes
d.	Endocrinologist (diabetes doctor)	1. No	2. Yes
e.	Ophthalmologist (eye doctor)	1. No	2. Yes

3. Have you seen any other type physician?

1. No 2. Yes, What Type?_____

4. Which of the following other health care providers have you received care from in the past year (since Christmas of 1997)? *(Read each item to patient and circle their response).*

a.	Nutritionist	1. No	2. Yes
b.	Diabetic educator	1. No	2. Yes
c.	Social worker	1. No	2. Yes
d.	Home health nurse	1. No	2. Yes
e.	Psychologist	1. No	2. Yes
f.	Therapist (Physical, Occupational)	1. No	2. Yes

5. Which of the following have you received care from in the year (since Christmas 1997)? *(Read each item to patient and circle their response).*

a.	Chiropractor	1. No	2. Yes
b.	Accupuncturist	1. No	2. Yes
c.	Herbalist	1. No	2. Yes

6. Have you seen any other alternative medicine practitioners?

1. No 2. Yes. What type?_____

7. Which of the following programs have you participated in during the past year (since Christmas of 1997)? *(Read each item to patient and circle their responses).*

a.	Diabetes education classes	1. No	2. Yes
b.	Diabetes support groups	1. No	2. Yes
c.	Exercise classes	1. No	2. Yes
d.	Nutritional support groups	1. No	2. Yes
e.	Meals on Wheels	1. No	2. Yes
f.	Adult Day Care	1. No	2. Yes
g.	other:_____		

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8. Where do you live?

1. In a house or condominium that you own
2. In a family member's house
3. In a friends house
4. In an apartment or house you rent
5. In a senior home/facility/assisted living facility
6. other:_____

9. Who do you live with?

1. Alone
2. With a spouse / significant other only
3. With a child only
4. With a child and the child's family
5. With a friend
6. With a paid caregiver
7. Child lives with you
8. other:_____

10. How do you usually travel around town? *(Circle all that apply).*

1. In own car that I drive
2. In own car that someone else drives
3. On a bus
4. In a handicab
5. Taxi
6. Other:_____

11. What is your Marital Status?

1. Single
2. Married
3. Separated
4. Divorced
5. Widowed

12. Do you have someone who would take care of you for a few days if necessary?

1. Yes 2. No

Who:_____

13. Have you been hospitalized in the past year?

1. Yes 2. No

when	for what	for how long
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

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SF-36

These first questions are about your health now and your current daily activities. Please try to answer every question as accurately as you can.

Q1 **In general would you say your health is...**

1. *excellent*
2. *very good*
3. *good*
4. *fair*
5. *poor*

Q2 **Compared to 1 year ago, how would you rate your health in general now? Would you say it is...**

1. *much better now than one year ago*
2. *somewhat better now than one year ago*
3. *about the same as one year ago*
4. *somewhat worse now than one year ago*
5. *much worse now than one year ago*

Now I'm going to read a list of activities that you might do during a typical day. As I read each item, please tell me if your health now limits you a lot, limits you a little, or does not limit you at all in these activities.

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Q3 **First, vigorous activities, such as running, lifting heavy objects, participating in strenuous sports. Does your health now limit you a lot, limit you a little, or not limit you at all?**

If R says s/he does not do activity, probe:

Is that because of your health?

1. *Yes, limited a lot*
2. *Yes, limited a little*
3. *No, not limited at all*

Q4 **...moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf. Does your health now limit you a lot, limit you a little, or not limit you at all?**

If R says s/he does not do activity, probe:

Is that because of your health?

1. *Yes, limited a lot*
2. *Yes, limited a little*
3. *No, not limited at all*

Q5 **...lifting or carrying groceries. Does your health now limit you a lot, limit you a little, or not limit you at all?**

If R says s/he does not do activity, probe:

Is that because of your health?

1. *Yes, limited a lot*
2. *Yes, limited a little*
3. *No, not limited at all*

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Q6 ...climbing several flights of stairs. Does your health now limit you a lot, limit you a little, or not limit you at all?

If R says s/he does not do activity, probe:

Is that because of your health?

1. Yes, limited a lot

2. Yes, limited a little

3. No, not limited at all

Q7 ...climbing one flight of stairs. Does your health now limit you a lot, limit you a little, or not limit you at all?

If R says s/he does not do activity, probe:

Is that because of your health?

1. Yes, limited a lot

2. Yes, limited a little

3. No, not limited at all

Q8 ...bending, kneeling, or stooping. Does your health now limit you a lot, limit you a little, or not limit you at all?

1. Yes, limited a lot

2. Yes, limited a little

3. No, not limited at all

Q9 ...walking more than a mile. Does your health now limit you a lot, limit you a little, or not limit you at all?

If R says s/he does not do activity, probe:

Is that because of your health?

1. Yes, limited a lot

2. Yes, limited a little

3. No, not limited at all

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Q10 ...walking several blocks. Does your health now limit you a lot, limit you a little, or not limit you at all?

If R says s/he does not do activity, probe:

Is that because of your health?

1. Yes, limited a lot

2. Yes, limited a little

3. No, not limited at all

Q11 ...walking one block. Does your health now limit you a lot, limit you a little, or not limit you at all?

If R says s/he does not do activity, probe:

Is that because of your health?

1. Yes, limited a lot

2. Yes, limited a little

3. No, not limited at all

Q12 ...bathing or dressing yourself. Does your health now limit you a lot, limit you a little, or not limit you at all?

If R says s/he does not do activity, probe:

Is that because of your health?

1. Yes, limited a lot

2. Yes, limited a little

3. No, not limited at all

The following four questions ask you about your physical health and your daily activities.

Q13 During the past 4 weeks, have you had to cut down the amount of time you spent on work or other regular daily activities as a result of your physical health?

1. Yes

2. No

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Q14 During the past 4 weeks, have you accomplished less than you would like as a result of your physical health?

1. Yes

2. No

Q15 During the past 4 weeks, were you limited in the kind of work or other regular daily activities you do as a result of your physical health?

1. Yes

2. No

Q16 During the past 4 weeks, have you had difficulty performing work or other regular daily activities as a result of your physical health, for example, it took extra effort?

1. Yes

2. No

The following three questions ask about your emotions and your daily activities:

Q17 During the past 4 weeks, have you cut down the amount of time you spent on work or regular daily activities as a result of any emotional problems, such as feeling depressed or anxious?

1. Yes

2. No

Q18 During the past 4 weeks, have you accomplished less than you would like as a result of any emotional problems, such as feeling depressed or anxious?

1. Yes

2. No

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Q19 During the past 4 weeks, did you not do work or other regular daily activities as carefully as usual as a result of any emotional problems, such as feeling depressed or anxious?

1. Yes

2. No

Q20 During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities like visiting with friends or relatives? Has it interfered...

1. not at all

2. slightly

3. moderately

4. quite a bit

5. or extremely

Q21 During the past 4 weeks, how much did pain interfere with your normal work, including both work outside the home and housework? Did it interfere...

1. not at all

2. a little bit

3. moderately

4. quite a bit

5. or extremely

Q22 How much bodily pain have you had during the past 4 weeks? Have you had...

1. none

2. very mild

3. mild

4. moderate

5. severe

6. or very severe

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Q23 During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your physical activities like visiting with friends or relatives? Has it interfered...

1. *all of the time*
2. *most of the time*
3. *some of the time*
4. *a little of the time*
5. *or none of the time*

The next questions are about how you feel and how things have been with you during the past 4 weeks.

As I read each statement, please give me the one answer that comes closest to the way you have been feeling; is it all of the time, most of the time, a good bit of the time, some of the time, a little of the time, or none of the time?

Q24 How much of the time during the past 4 weeks...did you feel full of pep? Read categories.

1. *all of the time*
2. *most of the time*
3. *a good bit of the time*
4. *some of the time*
5. *a little of the time*
6. *none of the time*

Q25 How much of the time during the past 4 weeks...have you have been a very nervous person? Read categories.

1. *all of the time*
2. *most of the time*
3. *a good bit of the time*
4. *some of the time*
5. *a little of the time*
6. *none of the time*

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Q26 **How much of the time during the past 4 weeks...have you felt so down in the dumps that nothing could cheer you up?** Read categories only if necessary.

1. *all of the time*
2. *most of the time*
3. *a good bit of the time*
4. *some of the time*
5. *a little of the time*
6. *none of the time*

Q27 **How much of the time during the past 4 weeks...have you felt calm and peaceful?** Read categories only if necessary.

1. *all of the time*
2. *most of the time*
3. *a good bit of the time*
4. *some of the time*
5. *a little of the time*
6. *none of the time*

Q28 **How much of the time during the past 4 weeks...did you have a lot of energy?** Read categories only if necessary.

1. *all of the time*
2. *most of the time*
3. *a good bit of the time*
4. *some of the time*
5. *a little of the time*
6. *none of the time*

Q29 **How much of the time during the past 4 weeks...have you felt downhearted and blue?** Read categories only if necessary.

1. *all of the time*
2. *most of the time*
3. *a good bit of the time*

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4. *some of the time*
5. *a little of the time*
6. *none of the time*

Q30 How much of the time during the past 4 weeks...did you feel worn out? Read categories only if necessary.

1. *all of the time*
2. *most of the time*
3. *a good bit of the time*
4. *some of the time*
5. *a little of the time*
6. *none of the time*

Q31 How much of the time during the past 4 weeks...have you been a happy person? Read categories only if necessary.

1. *all of the time*
2. *most of the time*
3. *a good bit of the time*
4. *some of the time*
5. *a little of the time*
6. *none of the time*

Q32 How much of the time during the past 4 weeks...did you feel tired? Read categories only if necessary.

1. *all of the time*
2. *most of the time*
3. *a good bit of the time*
4. *some of the time*
5. *a little of the time*
6. *none of the time*

These next questions are about your health and health-related matters.

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Now I'm going to read a list of statements. After each one, please tell me if it is definitely true, mostly true, mostly false, or definitely false. If you don't know, just tell me.

Q33 **I seem to get sick a little earlier than other people. Would you say that's...**Read categories.

1. *definitely true*
2. *mostly true*
3. *don't know*
4. *mostly false*
5. *definitely false*

Q34 **I am as healthy as anybody I know. Would you say that's...**Read categories.

1. *definitely true*
2. *mostly true*
3. *don't know*
4. *mostly false*
5. *definitely false*

Q35 **I expect my health to get worse. Would you say that's...**Read categories.

1. *definitely true*
2. *mostly true*
3. *don't know*
4. *mostly false*
5. *definitely false*

Q36 **My health is excellent. Would you say that's...**Read categories.

1. *definitely true*
2. *mostly true*
3. *don't know*
4. *mostly false*
5. *definitely false*

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Dr. _____

SMITH-FALVO PATIENT-DOCTOR INTERACTION SCALE

It is important to our resident physicians to know what you, their patients, feel about your interaction with them. Only with your help can the physicians be aware of what areas they should try to improve and in what areas they are especially good. Please help us give them this feedback by filling out the following questionnaire. Your physician will not see this questionnaire and will not be aware of what you, as an individual, said about him/her, but only what patients as a group said. Complete confidentiality will be maintained.

Thinking about the visit you just had with your physician, please give the response that best describes whether you agree or disagree with the following statements:

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree	Does Not Apply
1. The doctor went straight to my medical problem without first greeting me.						
2. The doctor greeted me pleasantly.						
3. The doctor seemed to pay attention as I described my condition.						
4. The doctor made me feel as if I could talk about any type of problem.						
5. The doctor asked questions that were too personal.						
6. The doctor handled me roughly during the examination.						
7. The doctor gave me an explanation of what was happening during the examination.						
8. The doctor explained the reason why the treatment was recommended for me.						
9. I felt the doctor diagnosed my condition without enough information.						
10. The doctor recommended a treatment that is unrealistic for me.						
11. The doctor considered my individual needs when treating my condition.						
12. The doctor seemed to rush.						
13. The doctor behaved in a professional and respectful manner toward me.						
14. The doctor seemed to brush off my questions.						
15. The doctor used words I did not understand.						
16. The doctor did not give me all the information I thought I should have been given.						
17. The doctor criticized me for not taking care of myself.						
18. I would recommend this doctor to a friend.						
19. I would return to this doctor for future health care.						

THANK YOU FOR TAKING TIME TO FILL OUT THIS QUESTIONNAIRE!

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Appendix P

Revised Questionnaire Packet for Second Patient Interview

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Patient Interview-Posttest

1. Which of the following type of physicians have you received care from in the past six months? *(Read each item and what's in parenthesis to patient and circle their response).*

a.	Podiatrist (foot doctor)	1. No	2. Yes
b.	Nephrologist (kidney doctor)	1. No	2. Yes
c.	Cardiologist (heart doctor)	1. No	2. Yes
d.	Endocrinologist (diabetes doctor)	1. No	2. Yes
e.	Ophthalmologist (eye doctor)	1. No	2. Yes

2. Have you seen any other type physician in the past six months?

1. No 2. Yes, What Type?_____

3. Which of the following other health care providers have you received care from in the past six months? *(Read each item to patient and circle their response).*

a.	Nutritionist	1. No	2. Yes
b.	Diabetic educator	1. No	2. Yes
c.	Social worker	1. No	2. Yes
d.	Home health nurse	1. No	2. Yes
e.	Psychologist	1. No	2. Yes
f.	Therapist (Physical, Occupational)	1. No	2. Yes

4. Which of the following have you received care from in the past six months? *(Read each item to patient and circle their response).*

a.	Chiropractor	1. No	2. Yes
b.	Accupuncturist	1. No	2. Yes
c.	Herbalist	1. No	2. Yes

5. Have you seen any other alternative medicine practitioners?

1. No 2. Yes. What type?_____

6. Which of the following programs have you participated in during the past year (since Christmas of 1997)? *(Read each item to patient and circle their responses).*

a.	Diabetes education classes	1. No	2. Yes
b.	Diabetes support groups	1. No	2. Yes
c.	Exercise classes	1. No	2. Yes
d.	Nutritional support groups	1. No	2. Yes
e.	Meals on Wheels	1. No	2. Yes
f.	Adult Day Care	1. No	2. Yes
g.	other:_____		

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7. Where do you live?
   1. In a house or condominium that you own
   2. In a family member's house
   3. In a friends house
   4. In an apartment or house you rent
   5. In a senior home/facility/assisted living facility
   6. other:_____

8. Who do you live with?
   1. Alone
   2. With a spouse / significant other only
   3. With a child only
   4. With a child and the child's family
   5. With a friend
   6. With a paid caregiver
   7. Child lives with you
   8. other:_____

9. How do you usually travel around town? *(Circle all that apply).*
   1. In own car that I drive
   2. In own car that someone else drives
   3. On a bus
   4. In a handicab
   5. Taxi
   6. Other:_____

10. What is your Marital Status?
    1. Single
    2. Married
    3. Separated
    4. Divorced
    5. Widowed

11. Have you been hospitalized in the past year?
    1. Yes 2. No

when	for what	for how long
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

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Appendix Q

Revisions to Questionnaire Packet for Patient Interview

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Adjustments to Researcher-Developed Patient Interview

1. Recommendations for how the interviewer should handle each question was put in parenthesis.

2. For question #9, response category 4 was changed to state "with a child and the child's family" from "with a child's family."

3. Question #13 was added, "Have you been hospitalized in the past year?"

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Appendix R

Human Subjects Review

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EASTERN VIRGINIA MEDICAL SCHOOL
OFFICE OF RESEARCH
LEWIS HALL, SUITE 2054
700 OLNEY ROAD
NORFOLK, VIRGINIA 23507-1696

TELEPHONE (757) 446-8480
FAX (757) 446-8443

March 19, 1999

Carolyn Rutledge, M.S. CFNP
Eastern Virginia Medical School
Department of Family and Community Medicine
721 Fairfax Avenue
Norfolk, VA 23501-1980

RE: IRB #12-01-99-0163

Dear Ms. Rutledge:

The protocol for the study entitled, "**Interdisciplinary Team Approach to Geriatric Care,**" has been reviewed by the Institutional Review Board. Your protocol and consent form are now approved by expedited review and you may initiate the study. If you are conducting your research at one of the local hospitals you must receive the appropriate approvals from that hospital before initiating your study. The consent form has been stamped with the approval and expiration dates for your use. You should make copies of and use this stamped form for the consenting process until a different form supersedes it.

A progress report will be due **February 1, 2000**. At that time, please complete and return the Annual Report Form to the IRB. **Continued approval of this protocol is dependent upon the appropriate filing of these reports, which is the responsibility of the principal investigator**. In addition, please identify the principal investigator, IRB number, and study title in all correspondence regarding this protocol.

Thank you for your continued cooperation with the Institutional Review Board.

Sincerely,

James Shaeffer

James Shaeffer, Ph.D.
Chairman
Institutional Review Board

JS/[illegible]

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OLD DOMINION UNIVERSITY

College of Sciences
Department of Chemistry and Biochemistry
Alfriend Chemistry Building
Norfolk, Virginia 23529-0126
Phone: (757) 683-4078
FAX: (757) 683-4628

April 22, 1999

Ms. Carolyn Rutledge
Dept. of Family & Community Medicine
Eastern Virginia Medical School
721 Fairfax Ave
Norfolk, VA 23501-1980

Dear Carolyn:

The Old Dominion University Human Subjects IRB has approved your request that we waive review of your dissertation research project, "An Interdisciplinary Team Approach to Geriatric Care" on jurisdictional grounds.

Enclosed is a copy of the Review Notification Form. Please remember that you cannot use ODU facilities to process data which is identifiable to an individual study subject. If you need to do so, you must submit your research proposal to the ODU IRB for formal review.

Please contact me if you have any questions at 683-4085, e-mail: ppleban@odu.edu. We wish you success in your research endeavors.

Sincerely,

Patricia A. Pleban, PhD
Associate Professor and Chair,
ODU Human Subjects Institutional Review Board

c: Dr. Stacey Plichta, Dept. Community Health Professions
File

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Appendix S

Research Plan

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Research Plan

Constructs	Method	Program Component	Research Questions/Hypotheses	Tools
Set Goals	Quantitative	-Goal-oriented Activities	1. How well did team focus on goals?	-Teamwork Scale
Establish Team	Qualitative	-Develop Team	1. What disciplines make up team? 2. What are the roles of the various disciplines on the team?	-Observation "
	Quantitative	-Team Meetings	3. What teamwork behaviors do the team members perform well ? 4. What teamwork behaviors do the team members perform poorly? 5. Do teamwork behaviors improve over time among team members?	-Teamwork Scale " "
Clinical Guidelines	Qualitative	-Flowsheet -Newsletter -Didactic Sessions	1. What types of programs are developed to train providers to use clinical guidelines?	-Observation/ Interview
	Quantitative	-Patient Education Files	2. What are the benefits to each clinical program? 3. What are barriers to each clinical program?	-Diabetes Survey "
Database	Qualitative	-Database	1. What data do the team collect in order to train providers? 2. How does the team collect the data for the training program? 3. How does the team use the data in providing training to the providers?	-Observation/ Interview
Behavioral Changes	Qualitative	-Flowsheet -Newsletter -Didactic Sessions	1. What types of programs are developed to train providers in behavioral skills?	-Observation/ Interview
	Quantitative	-Resource Directory -Patient Education File	2. What are the benefits to each behavioral program? 3. What are barriers to each behavioral program?	-Diabetes Survey "
Outcomes				

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Constructs	Method	Research Questions/Hypotheses	Tools
Provider			
-Knowledge	Quantitative	1. Are providers aware of programs/resources?	-Diabetes Survey
-Attitude	Quantitative	2. The study group physicians will have a more positive attitude towards elderly patients than the control group physicians after the intervention program.	-Geriatric Attitude Scale
	"	3. The study group physicians will have a more positive view of working closely with other disciplines than the comparison group physicians after the intervention.	-Interdisciplinary Collaboration Scale
	"	4. The physicians will have a positive attitude to the diabetes programs.	-Diabetes Survey
-Behavior	Quantitative	5. The study group physicians will refer patients with type 2 diabetes to more community resources than the comparison group physicians after the intervention.	-Physician Survey -Chart Audit
	"	6. The study group physicians will be more compliant with the clinical guidelines than the comparison group physicians after the intervention.	-Physician Survey -Chart Audit -Diabetes Survey
	"	7. The study group providers will work better in interdisciplinary teams than the comparison group physicians after the intervention.	-Teamwork Scale
	"	8. The study group physicians will more frequently document behavioral interventions than the comparison group physicians.	-Chart Audit
Patient			
-Attitude	Quantitative	1. The study group patients with type 2 diabetes will be more satisfied with their physicians than the comparison group patients after the intervention.	-Smith-Falvo Doctor/Patient Interaction Scale
-Clinical	"	2. The study group patients will have higher levels of quality of life as measured by the SF-36 than the comparison group patients after the intervention.	-SF-36 & subsets
		3. The study group patients will have more improved clinical outcomes than the comparison group patients after the intervention.	-Patient Interview Survey

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Appendix T

Data Dictionary

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Appendix T
DATA DICTIONARY
Providers & Team

CONSTRUCT	***HOW MEASURED***	***SCALE***	***ANALYSIS***	***RQ***	***CODE***
Teamwork Assessment					
Teamwork Scale Categories -Team Orientation -Team Leadership -Communication -Monitoring -Feedback -Backup Behavior -Coordination -Summary team score	1. Almost Never 2. Rarely 3. Sometimes 4. Often 5. Almost Always	Categorical/ Likert	Descriptive	A3, A4, A5, B8, B14	Category Code: -tmorient, tmorent2 -tmleader, tmlead2 -tmcommun, tmcomm2 -tmmonitr, tmmonit2 -tmfdbck, tmfdbck2 -tmbckup, tmbckup2 -tmcoord, tmcoord2 -teamsum, teamsum2

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DATA DICTIONARY
Providers

CONSTRUCT	***HOW MEASURED***	***SCALE***	***ANALYSIS***	***RQ***	***CODE***
Demographics					
Age	Actual Number	Ratio	Descriptive		Age
Provider Classification	1. Faculty 2. Third-year resident 3. Second-year resident 4. First-year resident	Categorical	Descriptive		Provider
Gender	1. Male 2. Female	Categorical	Descriptive		Sex
Preference with Teams	1. On a team 2. Individually 3. With one other	Categorical	Descriptive		Function
Participated on Team	1. Yes 2. No	Nominal	Descriptive		Team

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Management of Diabetes					
Referral to Resources: -Diabetes Support Group (4a) -Nutritional Support Group (4b) -Diabetes Education Class (4c) -Exercise Class (4d) -Transportation Assistance (4e) -Elder Support Group (4f) -Adult Day Care (4g) -Home Delivered Meals (4h)	1. None 2. Few 3. Some 4. Most 5. Almost All 6. No Knowledge About (converted to 1)	Categorical/ Likert	Descriptive Wilcoxin Matched Pairs Mann-Whitney U	B4 B11	Provider Questions -dmgroup/dmgrou_2 -nutgroup/nutgro_2 -dmedu/dmedu_2 -exslcass/exclas_2 -transpor/transp_2 -eldergrp/eldrgp_2 -daycare/daycr_2 -meals/meals_2
Nonphysician Consultants: -Nutritionist (5a) -Psychologist (5b) -Diabetes Educator (5c) -Social Worker (5d) -Home Health Nurse (5e) -Alternative Med Pract (5f) -Chiropractor (5g) -Therapist (5h)	1. None 2. Few 3. Some 4. Most 5. Almost All 6. Not Worthwhile (Converted to 1)	Categorical/ Likert	Descriptive Wilcoxin Matched Pairs Mann-Whitney U	B4 B5 B11	Provider Questions -Nutrit/nutrit_2 -Psych/psyc_2 -dmeducat/dmed_2 -socwork/socwk_2 -homehlth/hmhlth_2 -altmed/altmed_2 -Chiropra/chiro_2 -Therapy/therpy_2
Referral to Specialists: -Podiatrist (6a) -Nephrologist (6b) -Cardiologist (6c) -Endocrinologist (6d) -Ophthalmologist (6e)	1. None 2. Few 3. Some 4. Most 5. Almost All 6. Not Worthwhile (Converted to 1)	Categorical/ Likert	Descriptive Wilcoxin Matched Pairs Mann-Whitney U	B5 B8 B11	Provider Questions -Podiatry/podtry_2 -Nephro/nephr_2 -Cardio/cardio_2 -Endocrin/endoc_2 -Ophthamo/opthmo_2

Recode for Referrals: -Numref1 & Numref2 (Diabetes Support Group, Nutritional Support group, Diabetes Education Class, Exercise Class) -Numref3 & Numref4 (Nutritionist Diabetes Educator, Podiatrist, Ophthamologist)	0. No resources used some or most of the time 1. One referred to 2. Two referred to 3. Three referred to 4. Four referred to	Categorical/ Likert			Numref1 Numref2 Numref3 Numref4
Recode for referral to some or most sites	1. Use 0, 1, or 2 resources some, most, or almost all of time 2. Use 3 or 4 resources some, most, or almost all of time	Nominal	Chi-Square McNemar		Numrefr1 Numrefr2
Recode Diabetes Support, Nutrition Support, Diabetes Education Classes and Exercise Classes from 5 response categories to 2 response categories	1. Use 0, 1, or 2 resources some, most, or almost all of time 2. Use 3 or 4 resources some, most, or almost all of time	Nominal	Chi-Square McNemar		Dmgrp2va Nutgrp2va Edgr2va Excls2va Dmg2va_2 Ntg2va_2 Dcl2va_2 Ex2va_2
Recode Nutritionist, Diabetes Educator, Podiatrist, and Ophthamologist from 5 response categories to 2 response categories	3. Use 0, 1, or 2 resources some, most, or almost all of time 4. Use 3 or 4 resources some, most, or almost all of time	Nominal	Chi-Square McNemar		Nutri2va Dmed2va Pod2va Ophth2va Nut2va_2 Ded2va_2 Pod2va_2 Oph2va_2

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Attitude towards Geriatrics					
Geriatrics Attitude Scale Items 1,4,7,9,14 were reverse coded to make higher scores indicate a more negative attitudes towards elderly Scores imputed (own average score) for three or less items missing on scale.	1. Strongly Disagree 2. Somewhat Disagree 3. Neutral 4. Somewhat Agree 5. Strongly Agree Total Score range from 14-70 with lower score indicating more positive views towards the elderly	Ordinal/ Likert Ordinal	Mann-Whitney U Wilcoxon Matched Pairs	B3 B10	GAS1-GAS14 (Pretest) GAS1_2-GAS14_2 (Posttest) GASSUM (Pretest) GASUM2 (Posttest)
Items recoded so that scale is divided so that low scores are a positive attitude towards the elderly and higher score are a negative attitude towards the elderly	0. Score of 14-34 1. Score of 35-70	Nominal	Chi-Square McNemar		GASUMR (Pretest) GASUMR2(Posttest)

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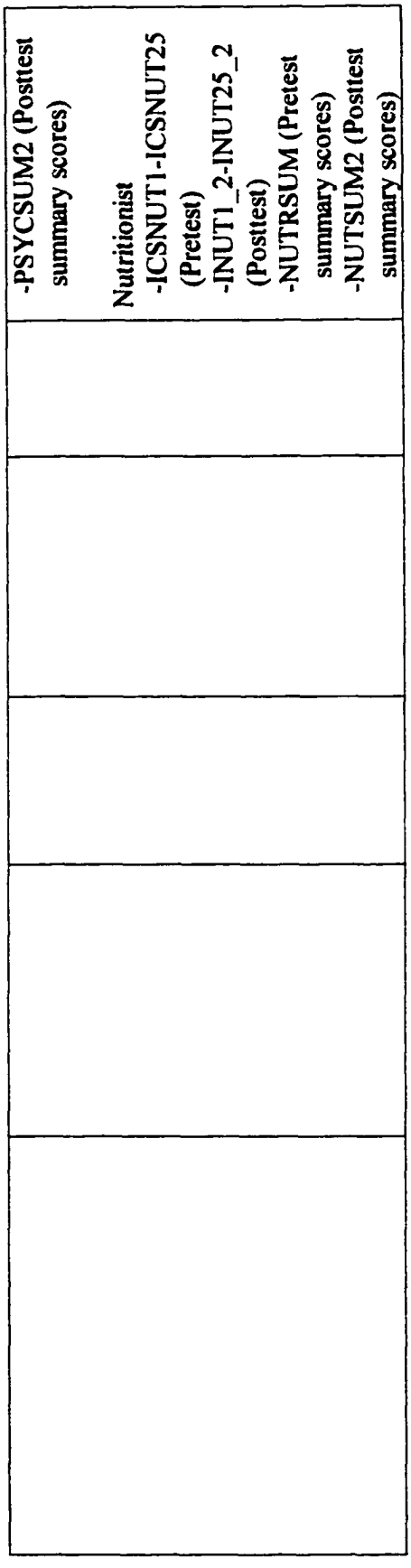
Attitude towards Interdisciplinary Collaboration					
Interdisciplinary Collaboration Scales (ICS) -Nurse Practitioners -Psychologists -Social Worker -Nutritionist	1. Strongly Agree 2. Moderately Agree 3. Slightly Agree 4. Slightly Disagree 5. Moderately Disagree 6. Strongly Disagree	Ordinal/ Likert	Descriptive Mann-Whitney U Wilcoxon Matched Pairs		Nurse Practitioner -ICS1NP-ICS25NP (Pretest) -ICSNP1_2-ICNP25_2 (Posttest) -ICSNPSUM (Pretest summary score) -NPSUM2 (Posttest summary score)
Items 3,6,7,12,14,15,16,17,25 are reverse coded so that higher scores indicate more dissatisfaction towards the discipline	Total Scores range from 25-150 with the lower scores indicating more positive attitudes towards working with the various disciplines	Ordinal	Mann-Whitney U Wilcoxon Matched Pairs	B3 B9	Social Worker -ICSSW1-ICSSW25 (Pretest) -ICSW1_2-ICSW25_2 (Posttest) -SWSUMM (Pretest summary scores) -SWSUMM2 (Posttest summary scores) Psychologist -ICS1PSYC-ICS25PSY (Pretest) -ICPSY1_2-IPSY25_2 (Posttest) -PSYCSUM (Pretest summary scores)



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DATA DICTIONARY

Patients

CONSTRUCT	***HOW MEASURED***	***SCALE***	***ANALYSIS***	***RQ***	***CODE***
Quality of Life (SF-36)					
SF-36 Categories -Health Transition -Mental Health -Role Emotional -Social Functioning -Vitality -General Health -Role-Physical -Physical Functioning -Bodily Pain	*Health Transition* = sf2 or sf2_2 *Mental Health* = sf25+sf26+sf27+sf29 +sf31 or sf25_2+sf26_2+ sf27_2+sf29_2+ sf31_2 *Role Emotional* = sf17+sf18+sf19 or sf17_2+sf18_2+ sf19_2 *Social Function* = sf20+sf23 or sf20_2+sf23_2 *Vitality* = sf24+sf28+sf30+sf32 or sf24_2+sf28_2+ sf30_2+sf32_2	Ratio	Mann-Whitney U Wilcoxon Matched Pairs ANCOVA	C3, C6	Category Codes: -hlthtran, hthtran2 -menthlth, menthlt2 -rolemot, rolemot2 -socfxn, socfxn2 -vitality, vitalit2 -gnlhlth, gnlhlth2 -rolephys, rolephy2 -physfxn, physfxn2 -bodfxn, bodfxn2

	General Health = Sf1+sf33+sf34+sf35+sf36 or sf1_2+sf33_2+sf34_2+sf35_2+sf36_2 *Role-Physical* = Sf13+sf14+sf15+sf16 or sf13_2+sf14_2+sf15_2+sf16_2 *Physical Function* = Sf3+sf4+sf5+sf6+sf7+sf8+sf9+sf10+sf11+sf12 or sf3_2+sf4_2+sf5_2+sf6_2+sf7_2+sf8_2+sf9_2+sf10_2+sf11_2+sf12_2 *Bodily Pain* = Sf21 + sf22 or sf21_2 + sf22_2			

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Satisfaction with Physician					
Patient-Doctor Interaction Scale Items 2,3,4,7,8,11,13,18, &19 were reverse coded to make higher scores indicate more satisfaction with physicians	1. Strongly Agree 2. Agree 3. Unsure 4. Disagree 5. Strongly Disagree Total scores range from 19-95. Higher scores indicating higher satisfaction	Ordinal/ Likert	Mann-Whitny U Wilcoxon Matched Pairs ANCOVA	C1, C2, C5	SUMPDIS (Pretest) SUMPDIS2 (Posttest)
Clinical Outcomes (Chart Audit)					
Practice site	1. Intervention Site 2. Comparison Site	Nominal	Descriptive		Site
Length of time as patient	Actual years	Ratio	Descriptive		Time
Age	Actual years	Ratio	Descriptive ANCOVA Regression		Age
Gender of patient	1. Male 2. Female	Nominal	Descriptive ANCOVA Regression		Gender
Weight of patient	Actual weight	Ratio	Descriptive Mann-Whitney U Wilcoxon		Weight Weight_2
Systolic blood pressure Diastolic blood pressure	Actual blood pressure	Ratio	Descriptive Mann-Whitney U Wilcoxon		Systolic Diastoli Systol_2 Diastol_2
Number clinical visits	Actual number	Ratio	Descriptive		Dmvisit dmvis_2

Clinical Outcomes (Chart Audit)	continued				
Tests Done -HgA1c -Albumin -Lipids -Home Glucose -Diet Review -Cardiovascular Exam -Foot Exam -Eye Exam	0. No 1. Yes	Nominal	Descriptive Chi Square McNemar		HgA1cyes HgAyes_2 Albumyes Albyes_2 Lipiyes Lipyes_2 Hmgluyes hgluyes2 Dietyes Dietyes2 Cvexyes Cvyes_2 Ftexyes Ftyes_2 Eyeexyes Eyeyes_2
Level of test -HgA1c -Albumin -Cholesterol -Home Glucose	Actual level	Ratio	Descriptive Mann-Whitney U Wilcoxon		HgA1c HgA1c_2 Albumin Album_2 Chol Chol_2 Homeglu HmGlu_2

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VITA

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May 1988	Old Dominion University, Norfolk, VA	Masters/Nurse Practitioner
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Professional Experiences (Selected):

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Publications (Selected):

Lorraine V. Rutledge CM, Lockett AR, Allen S. (1998) "Sensitizing Students to Functional Limitation in the Elderly: An Aging Simulation." Family Medicine. 30(1) 15-18.

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