Piedmont Health Collaborative Care Program

By

Robin Reed

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Advisor: Diane Calleson, PhD

____________________________________
Date

____________________________________
Second Reader: Bradley Gaynes, MD, MPH

____________________________________
Date
Abstract

Depression presents a large burden of disease to the public. The lifetime and 12-month prevalence of depression in the United States ranges from 13-16% (24,39). Depression affects individuals throughout their lifetime with societal costs seen in families, employment, and health care. Furthermore, depression ranks among the leading global causes of disability (40).

There is a reciprocal relationship between depression and physical illness, particularly diabetes. Diabetes affects approximately 12 percent of the U.S. population. Lifestyle changes, self-monitoring schedules, and treatments for diabetes present significant psychological and behavioral challenges for individuals with diabetes (41). Moreover, diabetics experiencing depression often have poorer health outcomes, more difficulty at home and at work, and higher health costs when compared to diabetics without depression (15-20,42).

The care for these individuals generally occurs in primary care settings, prompting program planners to develop targeted depression screening programs for individuals with chronic medical illnesses, such as diabetes. Collaborative care programs within primary care grew from the realization that screening for depression alone would not achieve improvement in depression. These programs use mental health specialists within primary care to serve as consultants to care managers and primary care providers involved in depression screening efforts within their clinic population.

The Piedmont Collaborative Care program occurs at the Carrboro Community Health Center in Carrboro, NC. The clinic cares for an underserved population, the majority of whom are Latino individuals. The program aims to improve the health of adults with poorly controlled diabetes. The program achieves improvements in health through better screening and treatment for depression.
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**Introduction**

The Piedmont Health Collaborative Care program developed by Piedmont Health Services and the UNC Center for Excellence in Community Mental Health aims to improve the health of adults with poorly controlled diabetes. Set in the Carrboro Community Health Center, the program is modeled on a belief that improving the detection and treatment of depression in adults with poorly controlled diabetes in primary care will improve the outcome of each disorder.

The program rationale for the Piedmont Collaborative Care program builds on the need for programs addressing more than one chronic condition. This approach to program planning is a response to the experience of a growing portion of the population who live with multiple chronic conditions. The concept of multimorbidity prompts the evaluation of patterns of multiple chronic conditions in one individual and the interrelationship of these conditions on disease severity, the ability to function in everyday life, and high health care costs. For example, individuals with three or more chronic conditions account for 80% of Medicare costs, according to a 2002 report (1). In the Medicaid population, individuals with mental illness and physical illness have 60-75% higher healthcare costs than someone with physical illness alone (2,3,4).

The relationship between depression and diabetes is one example. For individuals with diabetes, the development of mental illness and an alcohol misuse disorder increases yearly health costs from $10,000 to $35,000 (2,3). Individuals with diabetes and major depression, compared to those with diabetes alone, experience more symptoms of diabetes; greater difficulty leading a productive life; added difficulty adapting to diet, exercise, and medication regimens; higher hemoglobin A1c (HbA1c) levels; increased complications from diabetes, and elevated rates of death (7-17). Furthermore, depressed individuals who have a chronic physical illness suffer from more severe depression and more difficulties in everyday life than depressed individuals who do not have a chronic physical illness (15-17).
Primary care providers treat a large portion of adults with depression. Programs designed to improve depression care in primary care often include depression screening (18-22). The United States Preventive Services Task Force recommends screening for depression in primary care when "staff-assisted depression care supports", such as collaborative-stepped care approaches, are present (23, 25, 26). The Piedmont Health Collaborative Care program uses a collaborative stepped care approach. This approach uses the team of a primary care provider, care manager, and psychiatrist consultant to systematically treat depression. Collaborative stepped care programs for adults with depression and chronic health conditions, including diabetes, can result in fewer depressive symptoms, improved quality of life, improved physical health, and decreased health costs (26,27).

The Piedmont Health Collaborative Care program is based on the program, Improving Mood-Providing Access to Treatment (IMPACT). This program requires the addition of a care manager and consulting psychiatrist to the primary care practice. Piedmont Health employs the program care manager. The UNC Center for Excellence in Community Mental Health employs the consulting psychiatrist for the program.

The main program activities occur at the Carrboro Community Health Center in a primary care clinic providing care for underserved groups in the community in and surrounding Carrboro, NC. The program participants are individuals who receive health care at the Carrboro Community Health Center. The program team identifies individuals with poorly managed diabetes. The care manager and primary care provider screen these individuals for depression. The care manager provides participants structured support, education, and counseling about depression. The care manager and consulting psychiatrist monitor the participant's response to depression treatment. The primary care provider receives updates on participant progress from the care manager. The consulting psychiatrist provides supervision of the care manager and treatment recommendations for the primary care provider.
The Piedmont Health Collaborative Care program aims to improve the depression care in primary care by reducing common delays in monitoring the response to depression treatment and improving access to mental health care.

The first section of this paper contains a systematic review of the literature for programs with similar elements to the Piedmont Health Collaborative Care program. The systematic review highlights strategies for improved effectiveness in treating depression in primary care. The second section provides a description of the Piedmont Collaborative Care program plan goals and objectives, program theoretical basis, a logic model, an implementation plan, and sustainability plan. The third section comprises an evaluation plan for the Piedmont Collaborative Care program. The evaluation plan outlines strategies to gather data that reflect the effectiveness of the program implementation and participant outcomes. The paper concludes with a discussion of the program and prospects for the future.
Systematic Review

This literature review aims to identify programs described in the literature that share goals and design elements similar to the Piedmont Collaborative Care program. The literature review will serve to improve the effectiveness of this program. The central elements for this literature review include:

1) a target population of adults with poorly controlled diabetes
2) a program population served in a primary care setting and screened for depression
3) a collaborative stepped care program involved a care manager and a consulting psychiatrist
4) the target health condition focused on diabetes and depression
5) a primary focus of detecting depression, improving both depression and diabetes management, and/or reducing health care costs

The literature review examines the planning, implementation, interventions, activities, outcomes, and evaluation of programs that share central elements with the Piedmont Health Collaborative Care Program. Finally, the literature review concludes with an analysis of the advantages and disadvantages of each program and the implications for the Piedmont Health Collaborative Care program.

Methods

Research Question. This systematic review explores the question: “What are the published programs that share key elements with the Piedmont Health Collaborative Care Program?” Programs examined in this literature review used collaborative stepped care interventions for adults with diabetes and positive depression screening (Elements 1, 2, and 3).

Search Strategy. The PubMED electronic database served as the search engine to identify existing programs. Search terms used include “collaborative care” and “depression”, [MESH] and “collaborative care” and “depression” [MESH] and “diabetes mellitus” [MESH].
A review of reference lists of pertinent articles provided an additional source of potential programs.

Finally, Improving Mood Providing Access to Collaborative Treatment (IMPACT) is the program that provides the basis for included programs. The IMPACT website yielded articles meeting inclusion criteria. Articles associated with the design, methods, and long-term outcomes of the original IMPACT program were included to improve the quality of the analysis. I excluded titles and abstracts not meeting inclusion criteria.

**Inclusion Criteria**

1) an active or past program, which may or may not be part of a research protocol or pilot study

2) English language articles

3) articles describing programs that share central elements with this program, or at minimum, elements 1 through 3.

First, excluded programs include those that screened for depression in a general clinic population without a focus on a specific coexisting medical illness. Next, programs were excluded that screened for depression without offering collaborative stepped care. Finally, a discussion of the core components of the IMPACT program is included since it closely resembles the Piedmont Health Collaborative Health program.
Summary of Promising Programs

Improving Mood Promoting Access to Collaborative Treatment (IMPACT)

First published in 2001, the IMPACT program closely resembles the Piedmont Health Collaborative Care program. The IMPACT program aimed to improve depression care for elderly individuals seen in primary care clinics. The program began with the use of a depression-screening questionnaire to identify eligible participants. Then, eligible participants that chose to enroll in the program received frequent phone or in-person contact from a care manager. These contacts focused on monitoring for changes in depression care and monitoring for other potential problems such as medication side effects. The program intervention used a collaborative stepped care approach, which involved the addition of a care manager and a consulting psychiatrist to the depression care provided by a primary care provider. Together, the care manager and consulting psychiatrist met weekly in person or by phone to discuss new program participants and participants not improving with the current treatment plan.

The care manager implemented much of the intervention, following a program intervention algorithm, stepped-care, which prompted specific changes in depression treatment for participants whose symptoms did not improve to target goals. The care manager offered problem-solving-based therapy in lieu of or in addition to medication management by the PCP. In addition, the care manager performed several other program activities. For example, the care manager used a patient-tracking spreadsheet to track symptom changes and facilitated the communication among the program team.

There are several important program design considerations that will be discussed in the analysis. The program was implemented as a randomized controlled trial (RCT). Initial program implementation occurred in diverse locations in the United States. Furthermore, the program population overrepresented minorities and individuals with low to middle incomes. Payer sources ranged from health maintenance organizations (HMO) to the Veteran’s Affairs (VA) Health system.
Notably, most participants suffered from multiple chronic medical conditions. Finally, funding was provided by foundations, HMO, and the National Institutes of Mental Health.

Evaluation methods, design, and results are described in the literature as well. Process-oriented evaluation occurred via use of internal and external research advisory groups and granting agencies. Measured outcomes included changes in the primary outcome, depressive symptom severity, as measured by a validated screening tool, the Patient Health Questionnaire-9 (PHQ-9). The IMPACT program improved depression treatment response. In addition, the program evaluators reported secondary outcomes including changes in health-related quality of life, participant satisfaction, and the self-efficacy and self care of chronic medical conditions. Changes in self care behaviors for chronic pain and diabetes were also measured, although not targeted as a program activity or intervention (28, 29, 30).

Program evaluators gathered cost data from participant reports and claims data. Indirect and direct cost changes were measured. For example, early reports from the IMPACT program showed a decrease in “depression-free days” with an incremental cost-effectiveness ratio comparable to many medical interventions (31). Later reports showed decreased total health costs four years after the intervention. (32)

While the original IMPACT program established a collaborative care model with stepped care as an effective program in improving depression outcomes in primary care, several limitations must be noted. The published material regarding IMPACT primarily comes from programs implemented as part of a randomized controlled trial. Programs within large studies are difficult to mimic in everyday clinic settings. However, the program planners hoped to generalize the program intervention to diverse settings by choosing program locations in both urban and rural settings with a large number of participants of low socioeconomic status and overrepresentation of minorities. The program occurred in diverse practice and payer settings, such as academic centers, private practice, HMO, VA, and an independent provider association.
Surveys of participant outcomes occurred in a blinded fashion at 3 months, 6 months, 12 months, 18 months, and 24 months. Participants were paid to participate in survey response (28, 29, 30).

Since many primary care settings lack the resources to implement collaborative stepped care for depression in an entire adult clinic population, subsequent IMPACT-like programs focused program efforts on populations with a long-term illness such as chronic pain, diabetes, or hypertension. Specifically, the following three programs include those using IMPACT-like collaborative stepped depression care for adults with diabetes.

**Collaborative Care for Patients with Depression and Chronic Illnesses (CCPDCI)**

Several of the IMPACT investigators recently published results from a single-blind randomized controlled trial program of an IMPACT-like intervention in 14 primary care clinics associated with Group Health Cooperative in western Washington state. This program tried to determine if a single collaborative care intervention could improve health outcomes in four common and high cost chronic conditions in a cost effective way. Adults with poorly managed hyperlipidemia, hypertension, and diabetes were the program target population. A guiding principle for this program was that the presence of depression increases the risk of adverse health outcomes and high health care costs. The collaborative care approach described in the IMPACT program served as the primary intervention. The goals of this program included improvement in depression, diabetes, hypertension, and hyperlipidemia outcomes.

Since the program sought to simultaneously address multiple chronic diseases, care managers incorporated self-care and education material for diabetes, hypertension, and hyperlipidemia into the program activities. In addition, care managers offered problem-solving psychotherapy (PST) as part of the intervention, as in the IMPACT model. Furthermore, intervention treatment providers followed algorithms for medication management of each illness. The use of mailed depression screens represents a key difference from the Piedmont Health Collaborative Care Program.
The evaluation method for measuring process outcomes is not explicit in current published material. However, funding sources, the NIMH and Group Health Cooperative of Puget Sound, likely required follow-up program evaluation after implementation. A participant oversight or leadership role remains unclear. Since program coordinators and investigators also developed the IMPACT model and subsequent IMPACT-like programs, it could be deduced that they are familiar with maintaining fidelity to the core components of the program.

The health outcomes measure by program evaluators included reduction in hemoglobin A1c for diabetes, systolic blood pressure for hypertension, low-density lipoprotein for hyperlipidemia, and the PHQ-9 for depression severity. Secondary outcomes include patient satisfaction, quality of life, and monitoring of changes in commonly used medications for each illness.

While program planners acknowledged the funding and workforce resources of a RCT are generally unavailable in most clinic settings, they tried to conduct the program in a manner modifiable for real-world settings. For example, eligible participants who received ongoing psychiatric treatment or with were diagnosed with a chronic mental illness other than depression were excluded. If the clinic did not attempt to exclude some patients with mental illness other than depression, the volume of participants could overwhelm the program staff and introduce additional confounding. Notably, the presence of substance misuse or anxiety was not an exclusion criterion. This better represents a real-world patient in whom depression may be the primary diagnosis or a symptom related to substance misuse or anxiety.

In comparison, the Piedmont Health Collaborative Care program uses the core IMPACT components in screening for depression in adults with diabetes. The primary outcomes of the Piedmont Health Collaborative Care program will focus on reduction in hemoglobin A1c and depression symptoms. Due to limited program personnel, diabetes-related medication changes as secondary outcomes will not be measured.
Whether or not study participants were paid to participate in CCPDCI remains unclear. Finally, the findings published in both of the IMPACT programs discussed thus far provide helpful estimations of care manager patient contacts (26).

**The Pathways Program**

Prior to publication of the (CCPDCI), IMPACT investigators developed a program that aimed to improve both depression and diabetes care in adults. The goal of this program is related to the reciprocal adverse impact of depression and diabetes. While targeting adults with poorly managed diabetes was not an explicit goal, the mean hemoglobin A1c outcome of the Pathways program participants equaled that of the CCPDCI program.

Program intervention and program administrator activities were similar to the future CCPDCI, although they lacked self-care or education efforts for diabetes care. Process outcomes were not explicit in the published reports of the Pathways program. Clinical outcomes showed a reduction in depression severity and higher rates of satisfaction with treatment of depression. A reduction in hemoglobin A1C reduction was not achieved.

Finally, one notable finding includes higher rates of dysthymia (a low grade chronic depression with the episodic nature of Major Depressive Disorder), 70%, in program participants than were found in a prior program, 20-30%, within the same HMO. Program coordinators note that this may represent the effect of a chronic medical illness in limiting improvement in depressive symptoms (25).

**Prevention of Suicide in Primary Care Elderly: Collaborative Trial (PROSPECT)**

The PROSPECT program aimed to reduce suicidal ideation and depression in older individuals by using a collaborative stepped care intervention for depression management. The primary team members included the care manager, psychiatrist consultant, psychologist consultant, and primary care physician. Providers offered therapy and/or medication management for patients with depression. Several years after the original publication of
PROSPECT, program evaluators compared the mortality rates for patients with diabetes and depression who participated in the program to those not in the program.

When compared to outcome measurements used in similar programs, the clinical outcomes of PROSPECT included slightly different estimations of improvement in depression severity, such as percent of symptom reduction. Suicidal ideation reduction represented a unique measurement of the PROSPECT program as it was not reported as an outcome measurement in the other programs included in the literature review. Notably, diabetic patients with depression who participated in the collaborative care intervention were less likely to die at five years when compared to diabetic depressed patients not participating in the program. Furthermore, depressed patients without diabetes in the program were not at decreased risk of death when compared to depressed patients not participating in the program.

Finally, limitations of the PROSPECT program include the use of participant self-report for diabetes diagnosis used for inclusion into the mortality analysis and the potential for factors other than the program cause the reduced mortality seen for participants. Cost data reports from PROSPECT are unavailable as well. (33,34).

Analysis

The programs included in this systematic review offer helpful insights into planning and evaluation of the Piedmont Health Collaborative Care program. While the initial IMPACT and PROSPECT programs screened for depression in all adults, each occurred in a primary care clinic setting and used collaborative stepped care approaches to improve care for adults who screened positive for depression. (25, 29-29)

The remaining programs discussed in the literature review targeted improvement in depression care and outcomes in patients with diabetes, meeting central elements 3, 4, and 5. Each of the programs used a targeted screening program as in element 2, although several studies incorporated the use of a questionnaire, the Symptom Checklist (SCL), to gauge baseline depressive symptoms and at various points throughout the program. The Piedmont
Health Collaborative Care program does not plan to use the SCL. The rationale for use of the SCL is based on the ability to detect milder depressive symptoms that may be more difficult to treat but remain potentially disabling. Furthermore, The SCL questionnaire also requires additional time and effort from the care manager and participant.

Training and educational activities for the care manager and primary care provider remain an activity to be further clarified in the Piedmont Health Collaborative Care program. All of the reviewed programs appeared to provide basic education to program team members regarding depressive symptoms and treatment of depression (25, 26, 28-30, 33, 34). The training method theory is not explicit although it appears to be based on IMPACT training modules specific to the program components, staff roles, and methods for measuring outcomes. The published programs used care managers with either nursing or social work prior training. The designated Piedmont Collaborative Care program care manager lacks a graduate health degree but excelled in bachelor’s training in Spanish and International Relations and brings experience in care management within Piedmont Health Services. Providers and administration at the Piedmont clinic trust and support this care manager’s role in the Piedmont Health Collaborative Care program. This trust and support comes from past positive experiences in care coordination and the execution of a protocol for improving care for chronic pain. However, enhanced care manager training in specific psychotherapeutic techniques will remain an ongoing priority and funding challenge.

Program leadership currently favors Problem-Solving Therapy in Primary Care (PST-PC) and Motivational Interviewing, as offered in IMPACT and Pathways (25, 26, 28-30, 34). The IMPACT program website currently indicates that their online program and PST-PC training is free of charge, although formal completion of training, if financially feasible, is encouraged by the authors. The consulting psychiatrist in the Piedmont Health Collaborative Care program provides additional training expertise to the care manager regarding diagnosis, course,
treatment, and local resources. IMPACT training for the consulting psychiatrist occurred prior to the Needs Assessment initiation.

The process outcomes described in the literature review are vague. The IMPACT and CCPDCI program received HMO approval for the programs and Institutional Review Board (IRB) approval for program sites affiliated with an academic institution (25, 26, 28-30, 34). The HMO and IRB likely served in an oversight capacity for the program.

Publications described in this literature review lack explicit statements about participant involvement in program planning, although they report that participant satisfaction surveys indicate satisfaction with the IMPACT, CCPDCI, and PROSPECT program (25, 26, 28-30, 33). The Piedmont Health Collaborative Care program will need to expand consideration of the program’s acceptability to the participant in order to deliver culturally appropriate care.

Each reviewed program achieved some degree of health outcome targets such as improvement in depression care and reduction in depressive symptoms for program participants (25, 26, 28-30, 33,34). However, the question of effectiveness in improving diabetes care remained doubtful until the CCPDCI program successfully achieved reduction in hemoglobin A1c. For example, the PATHWAYS program did not incorporate diabetes self care into the collaborative stepped care program and hemoglobin A1c remained unchanged after the program intervention (34). The CCPDCI program, published in 2010, incorporated diabetes self care activities and saw a statistically significant reduction in hemoglobin A1c. However, the baseline hemoglobin A1c for both the Pathways and CCPDCI study populations was the same (26, 34). This finding suggests that the use of a structured diabetes care program alongside the collaborative-stepped-depression-care program may enhance program effectiveness although direct causality cannot be assumed. Furthermore, the clinical significance of the magnitude of the reduction in hemoglobin A1c in the CCPDCI is difficult to estimate since the program was only recently completed. Finally, closer scrutiny of statistical methods between the CCPDCI
and Pathways study will help determine how much effort should be focused on the incorporation of diabetes self-care into the Piedmont Health Collaborative Care program plan.

The association of academic centers and managed care organizations with the programs described in the literature review likely added to program effectiveness through leadership, data management, evaluation methodology, and financial resources. Consulting UNC psychiatrists and Community Care of North Carolina (CCNC) affiliation will provide a similar resource to the Piedmont Health Collaborative Care program.

The programs reviewed in the literature provide inconsistent reporting of participation incentives to providers or participants. At times, the programs paid participants for their participation, although the published reports are inconsistent in reporting of the frequency and the amount of the payments. Piedmont Health Services uses a sliding scale fee for provider visits and has specific policies for patient billing. For example, regardless of the services provided, patients are routinely charged one fee at the onset of their clinic appointment. These services range from a primary care provider visit to a pharmacy reconciliation appointment. Furthermore, encounters with care managers are not billed to the patient.

Funding for the care manager and consulting psychiatrist is an important consideration. The care manager position at Piedmont Health Services is funded through 2012. The current consulting psychiatrist support for program planning occurs as part of the 2010-2011 salary for a psychiatry resident with the UNC Department of Psychiatry. Funding for the consulting psychiatrist position in 2011-2012 comes from the UNC CECMH. The consulting psychiatrist trainee supervisor receives support from both CCNC and UNC CECMH.

The overrepresentation of minorities in the original IMPACT program suggests that the IMPACT intervention model is appropriate for use in the Piedmont Health Collaborative Care program (28). Data is currently unavailable regarding specific minority representation in the programs discussed. Since the Carrboro Community Health Center primarily serves a Latino
population, the program will collaborate with a local Latino mental health provider, El Futuro, regarding cultural appropriateness and potential referral to mental health care.

Although the programs discussed often contain research components unlikely to be fully achieved by the Piedmont Pilot program, core components of program activities and interventions, along with effective use of community resources, provide many helpful lessons.

**Conclusion**

The literature review highlights the original IMPACT program along with two subsequent programs which target screening for depression in adults with diabetes that are served in primary care clinics.

An additional program sub-analysis, PROSPECT, explored mortality and suicidal ideation reduction in adults with diabetes who participated in a collaborative stepped care program targeting only depression. The PROSPECT program did achieve improvement in depression care and reduction in depressive symptoms. Each program used collaborative stepped care for adults screening positive for depression.

The use of diabetes self care programs, adequate training for program team members, and affiliation with diverse community partners appears to promote more effective programs. Use of program evaluation expertise may promote more accurate estimation of program process and outcome effectiveness. Collaboration between the Piedmont Health Collaborative Care program and colleagues at UNC with program evaluation expertise will help determine outcome effectiveness and strengthen sustainability efforts. In addition, continued collaboration with CCNC provides access to health care cost data for program participants receiving Medicaid and insight into state health priorities. Furthermore, this collaboration allows for enhanced support for program dissemination and planning and evaluation expertise since depression care is an organizational priority for CCNC.
Program Plan

Overview

There is a mutually adverse relationship between depression and physical illness. Depression presents a large burden of disease to the public. Estimates of the lifetime and 12-month prevalence of depression in the United States range from 13-16% (18,35). Depression can affect individuals throughout their lifetime with societal costs seen in families, employment, and health care. Furthermore, depression ranks among the leading causes of disability in the world (36).

Similarly, diabetes has wide-ranging effects. Diabetes affects approximately 12 percent of the U.S. population (37). Diabetes management presents significant psychological and behavioral challenges for individuals. Moreover, diabetics experiencing depression often have poorer health outcomes, more difficulty with everyday life and work, and higher health costs (9-14, 38).

The care for individuals with diabetes and depression often occurs in primary care settings, which prompted program planners to develop targeted depression screening programs for individuals with chronic medical illness, such as diabetes. Collaborative care programs within primary care grew from the realization that screening for depression alone would not achieve the desired outcomes. These programs use mental health specialists within primary care to serve as consultants to for depression screening programs delivered by care managers and primary care providers.

The Piedmont Health Collaborative Care Program hopes to improve the health in the communities it serves. While Piedmont Health serves several communities in central North Carolina, it chose to begin its program at the Carrboro Community Health Center. Piedmont
Health Services operates as a Federally Qualified Health Center thereby serving large numbers of uninsured individuals.

Piedmont Health services asked the UNC Center for Excellence in Community Mental Health (CECMH) to collaborate in the planning, evaluation, and clinical care of the program. The CECMH serves adults with chronic mental illness who are primarily seen by public providers. The CECMH also provides state leadership in interdisciplinary mental health training, policy, and advocacy.

The program will involve the addition of a care manager and consulting psychiatrist to the clinic setting. Care managers are a key component of successful primary care/mental health integration projects. In the Piedmont Health Collaborative Care program they will work with primary care clinicians and consulting psychiatrists to coordinate screening and monitor participant response to depression treatment. The consulting psychiatrist will serve as a supervisor to the case manager and reviews the care of the program participants on a weekly basis. The consulting psychiatrist will serve as a consultant to the primary care provider. The program will begin as a pilot program for one primary care provider’s patients before implementing the program within the entire clinic.

In addition, the local public mental health system will provide a key component of coordination for individuals needing specialty mental health care outside of the primary care. While acknowledging the present challenges in referral to mental health and substance abuse care, a streamlined referral process to the Orange-Person-Chatham (OPC) Local Mental Health Entity and UNC Psychiatric Services will be important for coordination of care.

The program will include measurement of outcomes such as reduction in the severity of depressive symptoms and improvement in diabetes, improved quality of life, and decreased healthcare costs.
Program Context

Existing Health Data

The Piedmont Health Collaborative Care program will target adults from ages 18-65 with poorly controlled diabetes. Currently, these individuals receive care in a publicly funded medical clinic, Carrboro Community Health Center, in Carrboro, NC. Two thousand and nine census data estimates the Carrboro population between 18,000 and 19,000 people. (39) Within the entire Piedmont Health system, approximately 2,200 adults in the clinic receive Medicaid. Approximately 1,000 adults received an antidepressant within the last year. Two thousand and ten Piedmont Health Services data estimates the health coverage of the Carrboro Community Health Center population as 40% with no insurance, 40% with Medicaid, and 10% with Medicare. The remainder of the population receives private insurance. The pilot provider serves approximately 20 individuals with documentation of poorly managed diabetes.

The project intervention, collaborative stepped care, will target adults with poorly controlled diabetes in hopes of treating undiagnosed or undertreated depression while lessening the severity and progression of diabetes.

Existing Health Plans and Policy Frameworks

Several health plans and policy frameworks support the plan for the Piedmont Health Collaborative Care program. An Institute of Medicine report Crossing the Quality Chasm, released in 2006, also highlighted the need for better integration of mental health and primary care (40). In addition, the Healthy People 2020 plan outlines several objectives relevant to the program. These objectives include increasing the proportion of primary care facilities with on-site or paid referral to mental health treatment, increasing the proportion of adults ≥ 18 years old who receive mental health treatment, increasing the proportion of primary care office visits that screen adults ≥ 19 years of age for depression, and the decreasing the proportion of the
diabetic population with an A1c value greater than 9 percent (41). These objectives stem from the presence of mental illness as the leading cause of disability in the United States and Canada accounting for 25% of all years lost to disability and premature mortality (42).

Finally, the Healthy Carolinians workgroup examining mental health continues to meet and formulate final state objectives for 2020. Meeting minutes indicate that preliminary objectives have yet to be outlined.

**Political Environment**

The political environment of three specific areas related to the program plan must be taken into account. The timing of program planning initiation falls during a time of uncertainty about federal healthcare reform, budget constraints across all sectors of the economy, and continued debate about collaborative depression care methodology in primary care.

Piedmont Health Services, as with other medical providers, confronts difficulty in estimating the number of individuals moving from the uninsured to the Medicaid population. As a Federally Qualified Health Center, part of their mission must involve care for the underserved. In addition, the current economic downturn reaches the health care sector in such a way that the uninsured numbers increase, reimbursement constraint grows, and available grant funding declines. Finally, the United States Preventive Services Task Force (USPTF), recommends the program intervention, depression screening in primary care, only if screening is followed by a support program within the screening facility (23, 24). Different primary care depression screening programs use either telephone or in-person support. Finally, political pressure from groups hostile toward funding care for undocumented immigrants poses a potential obstacle to implementation of the program.

**Consistency with Local, State, and National Priorities**

The issue of mounting healthcare costs with worsening disease control and increasing numbers of chronic conditions receives national attention. Depression ranks among the leading comorbidities, a fact which can significantly impact the control of medical illness and significantly
increase the associated health care costs (36). Approximately 9 percent of adults in North Carolina suffer from diabetes (45).

**Acceptability to Providers and Patients**

Providers at Piedmont Health initiated the process of assembling collaborators to formulate a program plan. Several managerial and clinical staff members attended IMPACT training attempted the initiation of program intervention within the clinic setting. The Piedmont Health Board of Directors includes patients who must approve implementation of the program. A local Latino mental health non-profit provider of mental health care, El Futuro, Inc., agreed to provide feedback regarding the cultural appropriateness of the intervention and planning process. Additionally, the care manager and consulting psychiatrist speak Spanish.

**Possible Financial Resources**

Clinical staff positions required for the intervention include a care manager and a consulting psychiatrist. Funding of these positions presents the greatest funding need. Care managers often come from backgrounds such as nursing or social work, or have experience working in health care settings. Care managers bring experience in supporting patients and coordinating care across the health system between a diverse group of providers and health care workers. The Carrboro Community Health Center currently employs two care managers. These positions receive funding for the 2011-2012 year. The Center for Excellence in Community Mental Health funds the consulting psychiatrist position for the 2011-2012 year.

The consulting psychiatrist financial commitment presents a potential barrier given that these individuals are medical doctors and have much higher salary expectations than other health care workers. Fee-for-service reimbursement for participant visits with consulting psychiatrist presents a potential source of funding. For example, in one collaborative depression care model, consulting psychiatrists provided direct consultation for 10% of participants.

**Technical Feasibility**
The program intervention, depression screening, and collaborative stepped depression care involves multiple providers and necessitates efficient and effective communication of treatment progress and recommendations. The use of an electronic medical record system within Piedmont Health Services will help facilitate communication between team members. While Piedmont Health Services provides mental health care via its primary care providers, planners must confirm that medical records pertinent to the program intervention remain under the same federal privacy protection designated for mental health and substance abuse records in general. One advantage is the presence of diabetes counseling within the Carrboro Community Health Center. Finally, needed technical improvements include clarification of the logistics of PHQ-9 administration, office availability, and automated program documentation within the EMR.

**Stakeholders**

Participating stakeholders include Piedmont Health Services, the UNC Center for Excellence in Community Mental Health, the UNC Department of Psychiatry, Community Care of North Carolina, clinic providers, and patients. Each stakeholder group possesses particular interests in the development of the program plan. Piedmont Health provides the primary medical care for program participants and holds an interest in improving the overall health of its clinic population involved in the intervention.

Piedmont Health also serves as a medical home within the Access Care network of Community Care of North Carolina (CCNC). Depression management represents a priority in disease management within CCNC and the Piedmont Health Collaborative Care program is among similar pilot projects across the state. In addition, the UNC Department of Psychiatry sought a separate designation for their community health mission and created the Center for Excellence in Community Mental Health.
This group works to improve the quality of individuals receiving mental health care within the public mental health system. One of the missions of the center is to improve collaboration with primary care providers and ease access to quality mental health services (45).

**Program Theory**

The Diffusion of Innovations Theory helps to provide a framework in which to guide activities relating to desired program outcomes. The focus on how new ideas spread within a group or from one group to another directs the plan for program implementation in the Carrboro Community Health Center. The key concepts of the Diffusion of Innovations Theory used to formulate the program plan include relative advantage, compatibility, complexity, trialability, and observability (46, 47).

The Piedmont Health Collaborative Care program presents advantages to providers, patients, and payers. Advantages for providers and patients include the location of depression care resources within the clinic setting thereby improving depression and diabetes care. Additionally, the intervention will involve interaction with a care manager who is familiar to patients already receiving care management services within the clinic. Currently, depression screening occurs but not in a targeted manner throughout the clinic. Hemoglobin A1C monitoring will help provide additional support in meeting a quality improvement measure of reducing the number of patients with a hemoglobin A1c less than 9 percent. Finally, health care cost monitoring will allow administrators a close look at a high-risk population and the feasibility of a collaborative care program in a community health center.

The program design and program intervention will involve key activities compatible with the providers’ quality measure goals and schedule demands. The providers presently target reduction in Hgb A1c and collaborate with care managers to improve care for patients with chronic pain. Patients seen at Piedmont Health, 80-90% of whom are Latino, frequently utilize the care manager involved in the program. Furthermore, the depression screening tool that will be used in this intervention, the PHQ-9, has been used in the Latino population (48).
Providers working with the Piedmont Health Collaborative Care program attended a training regarding the intervention and found it simplistic enough for implementation. The collaborative stepped care approach, involving care management contact with a patient, has been successful in similar initiatives at the Carrboro Community Health Center.

The program team chose to initiate the program on a pilot basis within one provider’s patient population prior to implementation of the program across the entire practice. The pilot period will involve close attention to logistical barriers, quality of care, and monitoring of the volume of participating patients.

The IMPACT program, on which the Piedmont Health Collaborative Care program is intervention is based, provides free online program training and a patient-tracking spreadsheet. The IMPACT program workshops present a future training option as well.
Goals and Objectives

Goal: Improve the depression care of adults with poorly controlled diabetes who are served at the Carrboro Community Center

Short-term objectives:

1) By July 2011, 80% of eligible participants served by the pilot provider will be screened for depression using the PHQ-9.

2) By May 2011, the PCP and care manager will report feeling comfortable with screening for depression after training completion.

3) By May 2011, the PCP and care manager will begin screening for depression in adults with diabetes with a hemoglobin A1c greater than 9.

4) By December 2011, 50% of participants will experience a 50% or greater reduction in the severity of depressive symptoms as measured by the PHQ-9.

5) By May 2012, 70% of participants will experience a one-point reduction in their hemoglobin A1c.

6) By May 2012, 70% of participants will experience a 0.5% decrease in total healthcare costs

7) By May 2012, 80% of participants will experience a 30% improvement in quality of life as measured by the quality of life measure.

Long-Term Objectives:

1) By December 2012, 80% of eligible participants within the entire clinic will be screened for depression.

2) By May 2013, 80% of participants in the maintenance phase will receive yearly depression screenings.

3) By May 2013, the care manager will be able to sustain 50% time on program activities.

4) By December 2013, the consulting psychiatrist will be able to sustain 40% time on program activities.
## Logic Model

<table>
<thead>
<tr>
<th>Resources</th>
<th>Activities</th>
<th>Outputs</th>
<th>Short &amp; Long-term Outcomes</th>
<th>Impact</th>
</tr>
</thead>
</table>
| -Care manager  
- Psychiatrist  
-Time available  
-Space for patient visits  
-Data tracking  
-Screening tool  
-Access to cost data  
-Printing capabilities  
-Relationship with local public mental health system  
-Cultural competency input  
-Consumer input  
-Literature source  
-Reimbursement method (fee-for-service) | -Intervention training for care manager  
-Care manager and psychiatrist meet to plan program  
-Care manager and psychiatrist develop complete needs assessment  
-Care manager and psychiatrist generate questions for providers and administrators  
-Care manager and psychiatrist meet with IT for medical record changes for intervention  
-Care manager and psychiatrist meet with local mental health providers  
-Use the PHQ-9 depression screening tool  
-Use the QOL scale  
-Use educational materials for patients  
-Care Estimate potential number of participants by searching the EMR.  
-Care manager records data about program participant outcome tracking.  
-Care manager and consulting psychiatrist complete Medicaid provider portal training to track cost data for participants with Medicaid. | -Staff completes intervention training.  
-Weekly care manager/psychiatrist meeting to review participant progress  
-Weekly care manager/psychiatrist meeting to plan program  
-Monthly program planning team meeting (clinic leaders, Piedmont, UNC, CCNC)  
-Initial PHQ-9 to qualified participants YEARLY  
-Face-to-face or telephone contact with participants WEEKLY and within 2 days of positive screen  
-Change treatment plan if improvement ≤ 50% reduction in PHQ-9 score  
-Care manager and consulting psychiatrist review cost data every month. | **Short term:**  
-Reduced depression (lower PHQ-9 score)  
-Improved Diabetes care (lower Hemoglobin A1C)  
-Decreased medical costs  
**Long term:**  
-Improved care manager comfort with addressing depression  
-Improved PCP comfort with treating depression  
-Expanded collaborative care model to other Piedmont Health Sites  
-Healthier participants | -Reduced depression  
-Improved Diabetes care  
-Improved quality of life  
-Improved integration of mental health and primary care  
-Healthier participants |
Implementation

Our program represents an initiative within the Piedmont Health Services’ Carrboro Community Health Center. Program planning and implementation will involve primary collaboration with the UNC Center for Excellence in Community Mental Health and Access Care of Community Care of North Carolina. The care manager, consulting psychiatrist, and primary care provider (PCP) will comprise the key program staff. The pilot phase of the program will focus on implementation within one provider’s panel of patients before expanding the program to the entire practice. The program activities will encompass three main areas: staff recruitment and training, program intervention, and program staff supervision and collaboration.

Recruitment and Training

The Piedmont Health Collaborative Care program will involve addition of a care manager and consulting psychiatrist to the clinic where the program will be implemented. Piedmont Health identified an internal care manager involved in a chronic disease management program for chronic pain. Primary care providers expressed confidence in the care manager’s ability to serve in a collaborative care program for patients commonly experiencing mental and physical illness.

In order to identify a consulting psychiatrist, Piedmont Health Services contacted the UNC Center of Excellence for Community Mental Health for ideas about collaboration with a psychiatrist. The recruited consulting psychiatrist chose to participate in the program as part of the Center’s Community Psychiatry Fellowship and Master’s of Public Health work. The Department of Psychiatry at UNC allowed the consulting psychiatrist to devote time to program development as well.

Training for the care manager, consulting psychiatrist, and PCP will focus on learning the IMPACT model of collaborative stepped depression care in primary care. The staff will access the training material via the free web-based IMPACT training modules.
The training program contains a discussion of depression diagnosis, treatment, prognosis, epidemiology, and the relationship with other chronic conditions; program intervention, problem-solving therapy, program data management, and the program research base. The staff will individually complete the eight hours training and then discuss it as a group. The addition of new primary care providers and care managers to the program will require completion of the IMPACT training.

The care manager will complete training about the fundamentals of mental illness through a program administered by the Orange-Person-Chatham Local Mental Health Entity (OPC-LME). This training will build a collaborative relationship with the OPC-LME regarding potential referral from the program for participants who need mental health care and for LME patients who need medical care. Additionally, the consulting psychiatrist and the care manager role play regarding participant/psychiatrist interaction and also observe participant/care manager interaction. This strategy will lend an advantage in that the consulting psychiatrist will provide real-time feedback and consultation about the application of training to direct participant encounters.

Training in the community health center Electronic Medical Record (EMR) system will present a key training need for the consulting psychiatrist. The care manager and the consulting psychiatrist will document and communicate participant encounters and recommendations to the PCP through the EMR. The consulting psychiatrist's familiarity with the EMR will aid the design of automated encounter documentation with participants. Furthermore, to perform the role of consultant, the psychiatrist must be able to review the EMR.

**Intervention activities**

Prior to beginning the actual intervention, the care manager will query the EMR for adults with diabetes with a hemoglobin A1c greater than 9 who are followed by the pilot provider. Then, the care manager will populate the patient-tracking registry within the EMR with the names of eligible participants and the date of an upcoming clinic visit.
If no visit is scheduled, the care manager will call the patient or send a letter prompting him or her to schedule a clinic visit with their PCP. Finally, the intervention activities focus on three encounter types; screening; initial assessment; and maintenance; some of which may overlap:

1) Screening. At the PCP clinic visit, the care manager will administer the PHQ-9 screening tool prior to the PCP seeing the patient. If the patient screens positive for depression, the care manager will educate the patient about the program, offer participation, and alert the PCP to the positive screen. If the patient chooses to participate, the care manager will offer to see the patient in the clinic after the PCP visit. If the participant is unable to meet, the care manager and participant will plan for a time, ideally within 2 days to 1 week, to complete the initial program assessment by phone or in-person at the clinic.

2) Initial Assessment. At the initial assessment, the care manager will gather an extended mental health history and document this information in the EMR for communication to the PCP. The care manager will then educate the patient about depression and offer a course of Problem-Solving Therapy - Primary care. For participants with more urgent matters, the care manager and PCP may consulting psychiatrist by phone or pager. In addition to stepped depression care, the participant and care manager will also assess the need for ancillary staff involvement such as nutrition counselors, pharmacists, or benefit counselors. Ideally, the care manager and consulting psychiatrist review the case within one week. This review will involve an overview of short and long-term issues facing the participant in addition to the past and present treatment strategies. If the review suggests the evidence of chronic mental illness, such as schizophrenia or severe short term needs, such as suicidal thinking, psychiatric consultation or referral to the public mental health system via the consulting psychiatrist or the care manager, respectively, will be considered.

3) Treatment and Maintenance Phase. After the care manager completes the initial assessment with the participant, a follow-up visit will be scheduled within at least two weeks to monitor the participant’s response to treatment.
The care manager and the consulting psychiatrist will continue to meet on a weekly basis and regularly communicate with the PCP in person or via the EMR. The care manager and the consulting psychiatrist will perform weekly updates of the data registry to monitor program outcomes. The weekly or bimonthly meetings between the care manager and the participant occur preferably face-to-face, although telephone visits remain an option. Finally, as participant will move to the maintenance phase complete symptom remission is achieved. Depending on the participant’s risk factors for relapse, care managers will follow up with participants in the maintenance phase every six to twelve months to perform PHQ-9 and monitor Hgb A1C.

**Collaborative Stepped Depression Care**

Intervention collaboration will involve the participant, PCP, care manager, and consulting psychiatrist. The foundation of the collaborative effort is communication of depression symptom improvement or lack of response between team members. This communication will focus on maintaining symptom improvement or changing the treatment plan when targeted symptom improvement goals are unmet. While the team will advise the participant about treatment options, the choice will ultimately belong to the participant.

The consulting psychiatrist will serve as an ongoing clinical supervisor for the care manager and as a consultant for the PCP. Particular areas of focus will include management of antidepressant medications, monitoring of medication side effects, evaluation of psychiatric manifestations of medical illness, and watching for psychiatric illness other than depression.

In order to meet program objectives, a stepped care approach will use prompts at certain intervals in the treatment course to ensure timely response to treatment complications and insufficient improvement in the participant’s depression. Furthermore, definitions of how the collaborative care team will designates response to treatment exist to ensure fidelity to the intervention and to monitor program treatment outcomes.

**Step 1.** The participant will begin treatment with either a course of PST-PC, lasting eight to 10 weeks, or antidepressant therapy or both.
The care manager obtains a PHQ-9 at each encounter in order to gauge treatment response. Initial response to antidepressant medications usually occurs within two to six weeks.

**Step 2.** If there is no response to antidepressant treatment after four to six weeks of an antidepressant at a therapeutic dose, the staff will initiate an alternate treatment plan. If there is a partial response by weeks four to six, a full trial (eight to 10 weeks) of the antidepressant at a full therapeutic dose will be recommended.

**Step 3.** Alternative plan options include switching or augmenting medication therapy for depression, adding PST to the treatment strategy, scheduling an evaluation with the consulting psychiatrist, or referral to specialty mental health care.

**Step 4.** Participants move into the maintenance phase when complete symptom remission occurs. This is the point at which the frequency of care manager contact decreases from weekly to monthly visits. The participant completes a relapse prevention plan with the care manager.

The program categorizes response to treatment as "full response / remission" of major depression as less than 3 / 9 DSM IV depressive symptoms **AND** at least a 50 % reduction the PHQ-9. "Full response / remission" of dysthymia is defined as less than 2 / 7 DSM IV depressive symptoms **AND** at least a 50 % reduction in the PHQ-9. A "partial response" is defined as at least a 30 % reduction in DSM IV depressive symptoms **and** the PHQ-9. The program defines "no response" of major depression as 5 or more DSM IV depression symptoms **OR** greater than 15 on the PHQ-9. The program defines "no response" of dysthymia as 3 or more DSM IV dysthymia symptoms **OR** greater than 10 on the PHQ-9.

**Resources**

Current resources exist to aid planning, implementation, and evaluation of the Piedmont Health Collaborative Care program. Human resources, such as the identified care manager and the consulting psychiatrist, have stable funding for the upcoming fiscal year. The program's cost and savings will help project future funding needs.
Reimbursement for the care provided and the potential grant funding present options for future funding resources. Resources to patients include a sliding scale fee for clinic visits and discount prescriptions at the clinic pharmacy.

Piedmont Health Services employs multiple positions within the organization that will provide an important support role. For example, the IT department presents a human resource to aid in the adaptation of program documentation into the EMR. In addition, billing and coding specialists and an office manager will help to track the costs and savings of the program and will help secure logistical support such as printing, clinic space, and scheduling. Due to collaboration with the OPC-LME and the UNC Center for Excellence in Community Mental Health, affordable and free trainings exist for the care manager. Finally, the Piedmont Health Services Corporate office provides several key physical resources such as printing, office space, and computers.
<table>
<thead>
<tr>
<th><strong>TIMELINE: ACTIVITIES</strong></th>
<th><strong>STAFF INVOLVED</strong></th>
<th><strong>DATES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Intervention training for care manager</td>
<td>Care manager &amp; trainers</td>
<td>Prior to May 1st, 2011</td>
</tr>
<tr>
<td>- Care manager and psychiatrist meet to plan program</td>
<td>Care manager &amp; consulting psychiatrist</td>
<td>Weekly</td>
</tr>
<tr>
<td>- Care manager and psychiatrist develop complete needs assessment</td>
<td>Care manager &amp; consulting psychiatrist</td>
<td>Prior to April 1st, 2011</td>
</tr>
<tr>
<td>- Care manager and psychiatrist generate questions for providers and administrators</td>
<td>Care manager &amp; consulting psychiatrist</td>
<td>Prior to April 1st, 2011</td>
</tr>
<tr>
<td>- Care manager and psychiatrist meet with IT for medical record changes for intervention</td>
<td>Care manager, care manager director, consulting psychiatrist</td>
<td>Prior to April 1st, 2011</td>
</tr>
<tr>
<td>- Care manager and psychiatrist meet with local mental health providers</td>
<td>Care manager, consulting psychiatrist, LME director, care coordinator</td>
<td>Prior to May 1st, 2011</td>
</tr>
<tr>
<td>- Use the PHQ-9 depression screening tool</td>
<td>Care Manager</td>
<td>- At clinic visit of eligible patient. - At weekly to monthly visits with participants.</td>
</tr>
<tr>
<td>- Use the QOL scale</td>
<td>Care Manager</td>
<td>- At initial assessment of participant - At 6 and 12 months after enrollment.</td>
</tr>
<tr>
<td>- Use educational materials for participants</td>
<td>Care Manager</td>
<td>- At each visit</td>
</tr>
<tr>
<td>- Care manager estimates potential number of participants by searching the EMR.</td>
<td>Care manager</td>
<td>- Prior to April 1st, 2011 - Monthly</td>
</tr>
<tr>
<td>- Care manager &amp; consulting psychiatrist records data about outcome tracking.</td>
<td>Care Manager and consulting psychiatrist</td>
<td>- Weekly</td>
</tr>
<tr>
<td>- Care manager and consulting psychiatrist complete Medicaid Provider Portal registration</td>
<td>Care Manager and consulting psychiatrist</td>
<td>Prior to April 1st</td>
</tr>
</tbody>
</table>
## BUDGET

<table>
<thead>
<tr>
<th>EXPENSES</th>
<th>2011-2012</th>
<th>2012-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed costs (annual)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care manager (0.5 FTE) + benefits</td>
<td>$22,000</td>
<td>$25,000</td>
</tr>
<tr>
<td>Consulting Psychiatrist (0.2 FTE) + benefits</td>
<td>$15,000</td>
<td>$25,000 (0.2 FTE)</td>
</tr>
<tr>
<td>Technical Support (IT, phone, computer)</td>
<td>$2,000</td>
<td>$2,000</td>
</tr>
<tr>
<td>Printing</td>
<td>$1,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>Educational Materials</td>
<td>$100</td>
<td>$200</td>
</tr>
<tr>
<td>REVENUE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visit Reimbursement</td>
<td>variable-enhanced reimbursement for Medicaid</td>
<td></td>
</tr>
<tr>
<td>PHQ-9 Reimbursement</td>
<td>$8.00 x # of screens</td>
<td></td>
</tr>
<tr>
<td>SALARY SUPPORT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care Manager (NC Health Net)</td>
<td></td>
<td>$22,000</td>
</tr>
<tr>
<td>Consulting Psychiatrist (UNC Center for Excellence in Community Mental Health)</td>
<td></td>
<td>$15,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$3,100</td>
</tr>
</tbody>
</table>
Strategies for Sustainability

Anticipation of widespread funding reductions and changes in the program staff at the Carrboro Community Health Center will increase sustainability of the care manager and the consulting psychiatrist positions. Close monitoring of the program time commitments for staff and participants, in addition to overall costs/benefits, will result in greater opportunity to sustain grantor or health plan payer financial support.

Barriers to sustainability exist. For example, the care manager faces competing priorities within the workplace. In addition, the consulting psychiatrist salary support needs will increase for 2011-2012. These barriers lower the long-term sustainability. Physical resources remain sustainable for the upcoming year. The participation of psychiatric resident physicians may help with building sustainability through participation in program development efforts.

Vision

Stakeholders must share a common vision in order for the program to continue to be sustainable. Stakeholders share an overall goal of improving the health of the Carrboro Community Health Center population with the primary program goal of providing high quality and cost-effective depression care for adults with poorly managed diabetes.

Results Orientation

The outcomes previously outlined highlight the recognized markers for effectiveness and speak to the interests of various stakeholders. These outcomes inform the evaluation strategy to improve the ongoing program. Ongoing monitoring allows future modification of the intervention and improvements in care.

Strategic Financing

At present, the Piedmont Health Collaborative Care program needs more secure funding for the 2012-2013 year. Clarification of the cost and benefits of the program to the participant and clinic will allow for adjustment in funding sources.
Clarification with the clinic billing and coding specialists will help provide accurate estimation of the cost of program activities. Monitoring of Medicaid client outcomes presents an opportunity to collaborate with CCNC. Grant funding also remains a potential source of support.

**Broad-based Community Support**

The program receives support from Piedmont Health Services, the UNC Center of Excellence for Community Mental Health, the UNC Department of Psychiatry, the AccessCare network of CCNC, OPC-LME, and El Futuro, Inc. Each supporter values the primary goal of the program and has a potential interface with program participants.

**Adaptability to Changing Conditions**

Finally, because the clinic serves a disadvantaged, often immigrant population, the volume of eligible participants may ebb and flow. Proactive follow-up of current participants and monitoring for potentially new participants will present an ongoing logistical task. Fidelity to outcomes monitoring and intervention design will make evaluation efforts more likely to have their intended effectiveness.
EVALUATION PLAN

Evaluation Rationale

Evaluation plays several within the program, organization, and community. Within the bounds of the program, the outcomes will be measured in order to gauge the effectiveness of the program intervention and highlight areas for improving the program. Identification of areas in need of improvement will strengthen communication between the program staff, clinicians, and administrators in order to build accountability and promote efficient implementation of the program. Furthermore, the goals of continuing program improvement and program dissemination will motivate program staff to conduct an evaluation for the purpose of strengthening implementation and program outcomes.

The Piedmont Health Collaborative Care program community and organizational contexts reinforce the need for a program evaluation. First, the program goals and interventions are consistent with Piedmont Health organizational goals for reduction of the number of individuals with a hemoglobin A1c greater than 9 and the improvement of the mental health care provided within their clinics. Second, the Latino community possesses an interest in the evaluation because it will shed light about the effectiveness of the program intervention within a community health center that cares for underserved Latinos.

Evaluation will strengthen understanding of the sustainability needs of the program. For example, evaluation will highlight the need for additional funding and support to improve the sustainability of the program during a time of scarce resources that is magnified in a community health center. Moreover, the diverse administrative, participant, and provider concerns will be more clearly articulated in the evaluation process, promote stakeholder buy-in, and therefore promote sustainability.

I will serve as an evaluator and facilitator of the evaluative efforts of those involved in the program. This role will involve bringing evaluation questions to the team for ongoing feedback, facilitating communication about perceived problems, and anticipating sustainability needs.
Limited funding prevents employment of an external program evaluator. As a program staff member and part of the planning team, I will bring historical knowledge about the formation of the program and the numerous strengths and weakness to the current structure of the team.

Internal and external evaluations provide unique strengths to the development and improvement of the program. For example, the involvement of organizations such as the UNC Center for Excellence in Community Mental Health and Community Care of North Carolina will bring an external collective evaluation knowledge and experience to the evaluation. In addition, an external evaluator without institutional or organizational ties may bring a less biased perspective about the program dynamics than an internal evaluator. On the other hand, the historical knowledge and understanding of program development, planning, and implementation, possessed by the internal evaluator will require time for an external evaluator to develop. Both types of evaluators will need an understanding of the program rationale, literature base, and unique clinic structure, such as Federally Qualified Health Center regulations. Finally, an evaluator needs to possess sensitivity to the competing and overlapping interdisciplinary and institutional interests in order to promote a shared constructive dialogue among stakeholders.

Ideally, the clinic providers, care managers, office managers, consulting psychiatrist, corporate managers, policy makers, and participants will be involved in the evaluation. The administrators and providers will most likely want to know how the program improved outcomes and whether or not the magnitude of improvements require a manageable amount of time, funding, and effort. Office managers will likely prioritize whether the program coincides with the existing flow of the clinic or if the program creates disruption for staff or participants. Policy-makers will likely value whether the program health outcomes, program costs, and potential savings are merit dissemination. Participants will most likely value whether or not the program improves their health at a manageable financial and time cost. As the program grows, the local mental health providers could also become involved in providing feedback about referral from the program to the public mental health system.
Finally, Several challenges for useful program evaluation exist. For example, the numerous competing priorities faced by stakeholders may result in insufficient time for a meaningful evaluation product.
Evaluation Study Design

The evaluation design is quasi-experimental and performs prospective and longitudinal comparisons between two groups. The participant group will be compared to the eligible participants who choose not to enroll. Depression severity, hemoglobin A1c, quality of life scores, and total health care costs are unbounded outcomes and will be gathered before and after the intervention.

There are several factors that limit using a quasi-experimental design for the evaluation. First, because the search for eligible patients in the EMR will only occur prior to the program, patients who establish care with the clinic after the program starts will be excluded. This will limit comparison of the participant’s hemoglobin A1c values measured after the program to the values of all of the patients with a hemoglobin A1c greater than 9 that are followed by the pilot provider. Second, participant variables, such as improved compliance with medication schedules, improved diet, and improved medical illness, will be potential confounders to consider when interpreting changes in hemoglobin A1c levels that will be measured after the program. Third, a lack of access to Medicare claims will limit reporting of health costs and saving for individuals with Medicare. Finally, selection bias will also be a concern since the eligible unenrolled group actually receives depression screening and comes to the attention of the provider. An alternative comparison group could be individuals with a hemoglobin A1c greater than 9 and seen by another provider within the clinic who will not implement systematic depression screening.

Implementation Evaluation. Fidelity to the program model will face challenges such as competing priorities within the clinic and the need for efficient delivery of care under financial and time constraints. For example, the program calls for weekly clinical supervision between the care manager, consulting psychiatrist, and primary care provider (PCP). Program staff will prioritize this collaboration as a regularly scheduled activity.
The program evaluation topics for discussion during weekly meetings will be ongoing logistical, staff, and funding issues. In addition, conformity to the treatment algorithm must be monitored to increase the likelihood of achieving targeted outcome measures.

Chart reviews will be conducted to monitor the team's compliance with the treatment algorithm and the goals for a timely response to changes needed in the treatment plan. In addition, implementation evaluation will incorporate estimations of care manager and consulting psychiatrist time commitments to the program to promote development of accurate sustainability estimates. Finally, because the program staffing brings together individuals from diverse organizations, implementation evaluation potentially gauges provider, administrator, and participant buy-in.

Outcome Evaluation. Improvement or resolution of depressive symptoms represents the primary program outcome. Additional outcome measures will include hemoglobin A1c level, quality of life, and health care costs. Program staff will track depression severity, hemoglobin A1c, and medical costs using existing health information technology within the Piedmont Health Services and CCNC data systems. The current Piedmont Health electronic medical record allows for inclusion of the PHQ-9 to measure depression severity and quality of life measure into an automated system that can be queried in the future for evaluation purposes.
Evaluation Methods

The Piedmont Health Collaborative Care program evaluation will use both qualitative and quantitative methods.

Qualitative methods will include observation of interactions between the care manager and the participant by the consulting psychiatrist. Individual interviews of program staff will be conducted on an ongoing basis to solicit feedback about how the program implementation can be improved. The care manager and the consulting psychiatrist will track the time spent in the planning process and in weekly reviews of the clinical record. Open-ended interviews will take place on an ongoing basis between the care manager, consulting psychiatrist, and PCP to address participant care and program logistics issues. The care manager and the consulting psychiatrist will discuss challenges facing the program on a weekly basis. The PCP and care manager will meet multiple times a week to discuss clinical care and program logistics. The program team will meet monthly.

Quantitative methods will be used in the evaluation process as well. An implementation fidelity tool will be used to monitor fulfillment of his or her implementation responsibilities and barriers to executing these responsibilities. Clinical data systems from North Carolina Medicaid and the Piedmont Health system will be used to document the intervention, monitor health care service use, and health care costs. Documentation of the primary intervention outcomes and the dates of participant contact with the care manager or the consulting psychiatrist will occur in a Microsoft Excel spreadsheet. Spreadsheets for active and eligible participants will be kept separate to monitor the effectiveness of screening effort.

Additional methods may be utilized as well. For example, an online anonymous survey represents an available tool for confidential feedback about program progress from the program
staff. Web-based video and telephone conferencing are technologies that could improve the efficiency of program staff communication and ensure that ongoing evaluation actually occurs.

Finally, the inclusion of stakeholder and administrative dialogue may prove challenging and secondary to time constraints, but will be key to expanding the program and ensuring sustainability.
## Logic Model

<table>
<thead>
<tr>
<th>Resources</th>
<th>Activities</th>
<th>Outputs</th>
<th>Short &amp; Long-term Outcomes</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Care manager</td>
<td>-Intervention training for care manager</td>
<td>-Staff completes intervention training.</td>
<td><strong>Short term:</strong></td>
<td>-Reduced depression</td>
</tr>
<tr>
<td>-Psychiatrist</td>
<td>-Care manager and psychiatrist meet to plan program</td>
<td>-Weekly care manager/psychiatrist meeting to review participant progress</td>
<td>-Reduced depression (lower PHQ-9 score)</td>
<td>-Improved Diabetes care</td>
</tr>
<tr>
<td>-Time available</td>
<td>-Care manager and psychiatrist develop complete needs assessment</td>
<td>-Weekly care manager/psychiatrist meeting to plan program</td>
<td>-Improved Diabetes care (lower Hemoglobin A1C)</td>
<td>-Improved quality of life</td>
</tr>
<tr>
<td>-Space for patient visits</td>
<td>-Care manager and psychiatrist generate questions for providers and administrators</td>
<td>-Monthly program planning team meeting (clinic leaders, Piedmont, UNC, CCNC)</td>
<td>-Decreased medical costs</td>
<td>-Improved integration of mental health and primary care</td>
</tr>
<tr>
<td>-Data tracking</td>
<td>-Care manager and psychiatrist meet with IT for medical record changes for intervention</td>
<td>-Initial PHQ-9 to qualified participants YEARLY</td>
<td><strong>Long term:</strong></td>
<td>Healthier participants</td>
</tr>
<tr>
<td>-Screening tool</td>
<td>-Care manager and psychiatrist meet with local mental health providers</td>
<td>-Face-to-face or telephone contact with participants WEEKLY and within 2 days of positive screen</td>
<td>-Improved care manager comfort with addressing depression</td>
<td></td>
</tr>
<tr>
<td>-Access to cost data</td>
<td>-Use the PHQ-9 depression screening tool</td>
<td>-Change treatment plan if improvement ≤ 50% reduction in PHQ-9 score</td>
<td>-Improved PCP comfort with treating depression</td>
<td></td>
</tr>
<tr>
<td>-Printing capabilities</td>
<td>-Use the QOL scale</td>
<td>-Care manager and consulting psychiatrist review cost data every month.</td>
<td>-Expand collaborative care model to other Piedmont Health Sites</td>
<td></td>
</tr>
<tr>
<td>-Relationship with local public mental health system</td>
<td>-Use educational materials for patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Cultural competency input</td>
<td>-Care Estimate potential number of participants by searching the EMR.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Consumer input</td>
<td>-Care manager records data about program participant outcome tracking.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Literature source</td>
<td>-Care manager and consulting psychiatrist complete Medicaid provider portal training to track cost data for participants with Medicaid.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Reimbursement method (fee-for-service)</td>
<td></td>
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</tr>
</tbody>
</table>
## Evaluation Planning Tables

### Short Term objectives:

**Short Term Objective 1:** By December 2011, 50% of participants will experience a 50% or greater reduction in the severity of depressive symptoms as measured by the PHQ-9.

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did 50% of participants experience a 50% or greater reduction in the severity of depression symptoms?</td>
<td>Project coordinator</td>
<td>Review of patient tracking information; pre and post PHQ-9.</td>
</tr>
<tr>
<td>Did primary care providers (PCP) experience greater support for depression care from the care manager and consulting psychiatrist?</td>
<td>Primary care providers (PCP)</td>
<td>Electronic survey Open-ended interview</td>
</tr>
<tr>
<td></td>
<td>Project coordinator</td>
<td></td>
</tr>
<tr>
<td>Did care managers experience greater confidence in educating patients and providing support for depression care?</td>
<td>Care managers</td>
<td>Electronic survey Open-ended interview</td>
</tr>
<tr>
<td></td>
<td>Project coordinator</td>
<td></td>
</tr>
<tr>
<td>Did participants feel the program involved affordable and accessible interventions?</td>
<td>Participants</td>
<td>Paper survey</td>
</tr>
<tr>
<td></td>
<td>Project coordinator</td>
<td></td>
</tr>
<tr>
<td>Did the care manager and consulting psychiatrist follow the depression treatment algorithm?</td>
<td>Project coordinator Care manager</td>
<td>Chart review</td>
</tr>
<tr>
<td></td>
<td>Consulting psychiatrist</td>
<td></td>
</tr>
<tr>
<td>In what ways can depression care be improved?</td>
<td>PCP</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td></td>
<td>Care managers Consulting Psychiatrist</td>
<td></td>
</tr>
<tr>
<td>Did the care manager feel training and support from the consulting psychiatrist was effective?</td>
<td>Care managers Consulting psychiatrist</td>
<td>Open-ended interview</td>
</tr>
</tbody>
</table>
**Short Term Objective 2:** By May 2012, 70% of participants will experience a one-point reduction in their hemoglobin A1c.

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did 70% of participants experience a one-point reduction in their hemoglobin A1c (hgb A1C) by May 2012?</td>
<td>Project coordinator</td>
<td>Review of patient tracking information; pre and post hgb A1c</td>
</tr>
<tr>
<td>Did participants receive referral for diabetes-supported care such as nutrition counseling, medication adherence, and foot care?</td>
<td>Project coordinator, Care manager, PCP</td>
<td>Chart review</td>
</tr>
<tr>
<td>Did participants receive education about the relationship between depression and diabetes?</td>
<td>Project coordinator, Care manager, PCP</td>
<td>Chart review</td>
</tr>
<tr>
<td>Did care managers feel confident in educating patients about diabetes and depression in addition to navigating referral for diabetes supports?</td>
<td>Care manager, Project coordinator</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>How can the diabetes management for participants be improved?</td>
<td>Care manager, Project coordinator, PCP, Participant</td>
<td>Open-ended interview</td>
</tr>
</tbody>
</table>
**Short Term Objective 3:** By May 2012, 70% of participants will experience a 0.5% decrease in total healthcare costs

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did 70% of participants experience a 0.5% decrease in total healthcare costs?</td>
<td>Project coordinator</td>
<td>Review of cost data</td>
</tr>
<tr>
<td>What kinds of health costs were decreased?</td>
<td>Project coordinator</td>
<td>Review of cost data</td>
</tr>
<tr>
<td>What kinds of costs were included or excluded for this estimate?</td>
<td>Project coordinator</td>
<td>Review of cost data</td>
</tr>
<tr>
<td>Did participants feel the program was costly?</td>
<td>Participants</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>Project coordinator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can we improve the cost effectiveness of the program?</td>
<td>Project coordinator</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>Piedmont corporate management</td>
<td></td>
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<tr>
<td>Site business offices participants</td>
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</tbody>
</table>

**Long Term Objectives:**

**Long Term Objective 1:** By December 2012, 80% of eligible participants within the entire clinic are screened for depression.

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did 80% of eligible participants within the clinic undergo screening for depression?</td>
<td>Project coordinator</td>
<td>Review of patient tracking information</td>
</tr>
<tr>
<td>Was sufficient time available to care managers for screening?</td>
<td>Project coordinator</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>Care manager</td>
<td></td>
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<tr>
<td>Did PCPs receive communication regarding screening results and participant progress in the program?</td>
<td>Care manager</td>
<td>Open-ended interview</td>
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<tr>
<td>Project coordinator</td>
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<tr>
<td>PCP</td>
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<tr>
<td>Did participants in maintenance phase receive a yearly screening?</td>
<td>Care manager</td>
<td>Review of patient tracking information</td>
</tr>
<tr>
<td>How can the fidelity of screening and communication of results be improved?</td>
<td>Care manager</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>Project coordinator</td>
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</tbody>
</table>
**Long Term Objective 2:** By May 2013, the care manager is able to sustain 50% time on program activities.

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the care manager able to sustain 50% time on program activities?</td>
<td>Care manager</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td></td>
<td>Piedmont corporate leadership</td>
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<tr>
<td>What other priorities compete for the care manager’s time?</td>
<td>Care manager</td>
<td>Open-ended interview</td>
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<tr>
<td></td>
<td>Piedmont corporate leadership</td>
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<td></td>
<td>Project coordinator</td>
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<tr>
<td>What are the sustainability needs of the care manager and consulting psychiatrist?</td>
<td>Care manager</td>
<td>Open-ended interview</td>
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<tr>
<td></td>
<td>Piedmont corporate leadership</td>
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<tr>
<td></td>
<td>Project coordinator</td>
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<tr>
<td>How can the time management and funding of the care manager position be improved?</td>
<td>Care manager</td>
<td>Open-ended interview</td>
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<tr>
<td></td>
<td>Piedmont Corporate leadership</td>
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<td>Project coordinator</td>
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</table>

**Long Term Objective 3:** By December 2013, the consulting psychiatrist is able to sustain 40% time on program activities.

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
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<tbody>
<tr>
<td>By December 2013, did the consulting psychiatrist sustain 40% time on program activities?</td>
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<tr>
<td>What other priorities compete for the consulting psychiatrist’s time?</td>
<td>Consulting psychiatrist</td>
<td>Open-ended interview</td>
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<td></td>
<td>Piedmont corporate leadership</td>
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<td>Center of Excellence leadership</td>
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<td></td>
<td>Project coordinator</td>
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<tr>
<td>How secure are the current sources of position funding?</td>
<td>Consulting psychiatrist</td>
<td>Open-ended interview</td>
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<td></td>
<td>Center of Excellence leadership</td>
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<td></td>
<td>Piedmont corporate leadership</td>
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<tr>
<td></td>
<td>Project coordinator</td>
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<tr>
<td>How can the time and funding of the consulting psychiatrist position be improved?</td>
<td>Consulting psychiatrist</td>
<td>Open-ended interview</td>
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<tr>
<td></td>
<td>Piedmont Corporate leadership</td>
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<td></td>
<td>Center of Excellence leadership</td>
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<td></td>
<td>Project coordinator</td>
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Dissemination Plan

Dissemination of the Piedmont Health Collaborative Care program evaluation will play several roles. First, the evaluation will inform stakeholders about the program. To effectively disseminate the evaluation, evaluators must carefully consider translation of evaluation methods and results into a meaningful language for stakeholders. The care manager and the consulting psychiatrist will serve as the project staff primarily responsible for presenting this information for site administration and for directing supervisors. Together, this group will develop the evaluation presentation format for various stakeholders. In addition, evaluation of pilot data could be incorporated into a grant proposal for project expansion.

The information conveyed in the disseminated evaluation will include several key items. First, progress toward the primary program outcomes; improvement in depression severity, reduction in hemoglobin A1c, improvement in quality of life, and reduction of medical costs; primary outcomes for program effectiveness. The audience for the dissemination will be the Piedmont Health Services leadership, the UNC Center for Excellence in Community Mental Health, and CCNC. These stakeholders will participate in ongoing program meetings and give direct feedback on implementation and opportunities for improvement.

Outcomes, logistical, staffing, and funding issues are the primary discussion points at these meetings. These issues will be presented in a Microsoft Word document format. Meeting minutes will be sent to stakeholders in order to clarify the major points, identify potential changes to the program, and outline issues for further discussion. We set a goal of monthly meetings in which interim reports occur. A yearly report will occur as well. These reports will allow the program staff to identify areas for improvement such as staff training, scheduling, and patient education and adherence.

Participants, local mental health providers, and Latino health advocate groups possess interest in the program evaluation. Participants will be given updates in document format on
their progress within the program.

Program staff will meet with local Latino mental health providers on a quarterly basis to solicit feedback. Furthermore, the program context builds upon existing collaborative depression care management in primary care literature and may be of interest to those interested in the intervention or those serving minority or immigrant populations. Additional opportunities for dissemination include presentation of materials at professional meetings, CCNC network meetings, and publication in peer-reviewed journals.
Discussion

The Piedmont Health Collaborative Care program aims to improve the depression care for individuals living with poorly controlled diabetes. The program tries to reduce the specific problems with disease severity, everyday life, and high health care costs faced by individuals with depression and diabetes (1).

The presence of mental health conditions worsens the effects of other illnesses (2,3,4). For individuals with diabetes, the addition of a mental illness leads much higher health care costs (2,3). Furthermore, individuals with diabetes and major depression, compared to those with diabetes alone, experience more symptoms; greater difficulty in work and home life; added problems with diet, exercise, and medication demands; higher hemoglobin A<sub>1c</sub> (HbA<sub>1c</sub>) levels; increased diabetes complications; and elevated rates of death (7-14).

Similarly, individuals with diabetes experience less benefit from treatments for depression when compared to individuals without diabetes. Finally, depressed individuals who develop diabetes suffer from more difficulty with daily life than individuals with depression alone (15-17).

The literature review highlights concerns raised by program planners and evaluators. First, the time and effort spent by participants and program team members in questionnaire completion must be considered along with other program activities. Lack of attention to the time and effort of program team members and participants could lead to disinterest and poor quality implementation of the program. Next, the limited descriptions in the literature about process outcomes provide minimal guidance for the Piedmont Health Collaborative Care program. The program is more likely to be successful if process outcomes are explicit and planned.

On the other hand, several program components described in the literature promote more successful programs. First, the incorporation of diabetes self-care programs within the
Piedmont Health Collaborative Care program can improve health outcomes such as Hgb A1c. Next, training for program team members promotes greater fidelity to the program implementation plan. Finally, affiliation with diverse community partners appears to enhance buy-in from participants and strengthen dissemination.

The Piedmont Health Collaborative Care program faces many challenges. These challenges include scarce funding for new health programs, increasing staff workloads, and shifting organizational priorities. These challenges potentially slow the program’s momentum for planning, implementation, and evaluation. Furthermore, these obstacles shift needed energy away from the program to other needs facing the program staff, providers, administrators, and participants. The information gained from the literature emphasizes the need to adapt the model programs to fit local needs. Keeping this concept in mind may reduce efforts to apply components of model programs in a manner that is financially and logistically unsustainable within the Piedmont Health Collaborative Care program context. However, these considerations must be balanced with the need to gather sufficient and accurate data to guide dissemination to other clinic sites, inform the decision-makers involved in the process, and seek future program funding. Finally, confronting these challenges by improving the health of individuals suffering from multiple illnesses, especially minorities in underserved areas, will bring health benefits to the entire community.

Acknowledgements
References


