Program Plan and Evaluation for the Bridge-to-Care Group Visit Program:
A Diabetes Education Program for Underserved Patients seen at the Student Health Action
Coalition (SHAC) Clinic at the University of North Carolina.

By

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I. INTRODUCTION

As one of the fastest growing diseases, type II diabetes is quickly becoming one of the most common chronic conditions in the United States. In North Carolina alone, the prevalence has doubled over the last fifteen years from 5% of North Carolina adults having diabetes in 1998 to 10.4% in 2013. Locally, Orange County has a lower prevalence than many other counties in the state of North Carolina with only 7.3% of adults having diabetes in 2011; however, the burden of suffering in Orange County is very disproportionate with most cases occurring in non-whites, those with less than a high school education, those with a household income less than $50,000 per year, and the uninsured. Thus, a significant need exists to target the populations in Orange County that have the most substantial burden of disease.

As one of the primary providers of outpatient charity care for the uninsured of Orange County, the Student Health Action Coalition (SHAC) student-run clinic at UNC sees many of the underserved patients disproportionately affected by this disease. In 2012, approximately 40% of the visits seen at SHAC were for chronic disease management, with diabetes being one of the most prevalent conditions treated. The demographics of the SHAC patient population align with those markedly affected by diabetes including mostly low income, poorly educated and primarily uninsured individuals. Currently, patients at SHAC with diabetes are seen for a single appointment where they receive medical therapy and minimal lifestyle counseling. However, this approach is not up-to-date with the best standard of care or the most effective ways of achieving disease control.

Evidenced-based practice has shown one of the most important components to any diabetes treatment plan is diabetes self-management education. The American Diabetes Association defines diabetes self-management education as “the ongoing process of facilitating
the knowledge, skill, and ability necessary for diabetes self-care." Self-management training aims to improve health outcomes and overall quality of life by teaching self-care behaviors, problem-solving skills and healthy and informed decision making. Comprehensive interventions promoting self-management skills and focusing on lifestyle changes have been shown to significantly reduce the rates of diabetes complications. Additionally, multiple trials have shown that lifestyle modifications which are one of the main focuses of self-management training have the greatest effect on blood glucose control.

The 2011 Orange County Community Health Assessment has identified diabetes self-management education as a vital method for reducing the disparities in diabetes prevalence in Orange County over the next few years. Despite seeing a significant number of individuals with diabetes each year, currently the SHAC clinic has no formalized education program or self-management training for patients. For these reasons, in the following I propose a plan to start diabetes self-management education at the SHAC clinic through a new program called Bridge-to-Care. The Bridge-to-Care program will seek to fulfill the unmet need for the underserved patient population seen at SHAC with a goal of improving disease-specific knowledge, lifestyle behaviors and overall disease control for individuals with type II diabetes.

The paper will begin with a systematic review of the literature to identify existing diabetes self-management education programs with components that could be successful in the SHAC clinic setting. The review includes an analysis of strategies that appear to be most effective in affecting outcomes as well as weaknesses that were taken into account when designing the Bridge-to-Care program. The second section of the paper contains the Bridge-to-Care program plan which includes the program context, theories, goals and objectives, implementation plan and a logic model. The third section of the paper focuses on the evaluation
plan including its rationale, design, methods and dissemination. The paper will conclude with a discussion of program significance.
II. SYSTEMATIC REVIEW

Research Question

The primary research question for the search strategy was: “In adults with diabetes, what are some current examples of the group visit education model delivered in a short-term setting (i.e. 6 months), and what can be learned from their development, implementation and evaluation?”

Search Strategy

After conducting a primary literature search to discover key terms, I identified the MeSH terms patient education and diabetes for inclusion in my search strategy. As no MeSH term exists for group visit education specifically, I also used “group education” to narrow the number of articles generated to a more manageable and applicable number. I searched PUBMED using the terms diabetes AND patient education AND "group education.” This yielded 101 articles, including one systematic review whose reference list was also reviewed for additional publications. I reviewed all titles and abstracts of articles obtained using this search strategy, and chose 5 articles based on the following inclusion criteria:

1. The article is in English
2. The program is designed for diabetes
3. The program is evaluated in some way
4. The program is designed for self-management education in a group setting outside of the medical appointment as opposed to didactic education
5. The intervention is broad with multi-disciplinary components
Summary of Programs

DESMOND Program

Program

The DESMOND program was designed for newly diagnosed type II diabetics seen in primary care practices in the United Kingdom, with a goal of using patient empowerment to improve biomedical, psychosocial, and lifestyle measures. The content for the program was constructed based on several different psychological theories of learning: Leventhal’s common sense theory, the dual process theory, and the social learning theory. By incorporating these theories into curriculum design, the program sought to understand how participants processed the idea of health and illness, while promoting both explicit and implicit learning through observation and modeling of individual behaviors.

Participants for the program were referred by 162 primary care practices within 4 weeks of diagnosis with type II diabetes. The program consisted of 6 hours of educational instruction delivered in either 1 day or 2 half-days by 2 health care professionals who received formal training for the program content. Learning was conducted in a self-elicited manner, with little didactic structure and focus on self-efficacy. Most of the curriculum was centered on lifestyle components that affect individual health including physical activity, nutrition, and cardiovascular risk factors. In addition, participants were encouraged to develop specific goals for behavioral change to work on after the program’s completion.

Evaluation

To assess the efficacy of the program, individuals enrolled in the study were randomized to either participate in the DESMOND curriculum or receive access to an equivalent number of hours of individual consultation with health care providers. 1109 patients were referred and
randomized for participation in the study and 824 gave consent for participation. Of these, 437 received the intervention and 387 were provided usual care in the control group. The groups were relatively comparable, with differences including a higher baseline HgbA1c (8.3% vs. 7.9%) and more participants on medication (17% vs. 12%) in the intervention group.

The study aimed to assess both initial short-term and long-term effects of participation, and thus, outcome measurements were taken at baseline and 4, 8 and 12 months after intervention initiation. Outcomes evaluated included biomedical measures (HgbA1c levels, blood pressure, weight, blood lipid levels) and lifestyle and psychosocial data (smoking status, physical activity, quality of life, beliefs about illness, depression, and emotional impact of diabetes). All statistical analyses were carried out on an intention to treat basis with regression models.

At 12 months after intervention delivery, participants of the DESMOND program showed several improvements when compared to the control group. The intervention group showed a greater average weight loss of 2.98 kg compared with 1.86 kg in the control group. Additionally, the intervention group had higher odds of not smoking, greater changes in illness belief scores from baseline indicating greater understanding of diabetes and its seriousness, an overall lower depression score, and a positive association between personal responsibility and weight loss that was not present in the control group. While HgbA1c levels had decreased more in the intervention group (-1.49%) than in the control group (-1.21%) at 12 months, the difference was not statistically significant. Other outcomes that were not significantly different between groups included blood pressure, blood lipid levels, physical activity and quality of life.
Overall, the study suggests the DESMOND program leads to greater improvements in some biomedical, psychosocial and lifestyle behaviors than traditional care. Strengths of the study include strong generalizability as the exclusion criteria were minimal and the program was designed for use in a primary care setting. Additionally, the study included a much larger number of participants than most other group education trials, increasing the power of the results obtained. Finally, the program provided a unique feature when compared to other group education curricula in that it was designed for newly diagnosed patients.

One weakness of the study is the incomparability of treatment groups at baseline, especially in regards to HgbA1c which served as one of the primary outcomes. The other major weakness lies in the study design as the curriculum was designed for delivery in one session, a time commitment that may not be feasible for some health care providers. The comparator group was also given access to many hours of intensive personal consultation, another situation that is not representative of most real-world patient-physician encounters.

**Diabetes X-PERT Programme**

**Program**

The Diabetes X-PERT Programme was designed for general medical practices in the United Kingdom with the goal of increasing self-management for individuals with type II diabetes and creating sustainable improvements in clinical, lifestyle, and psychosocial outcomes.\(^\text{11}\) The program was constructed based on theories of individual empowerment and discovery learning, seeking to help individuals use their innate abilities to gain mastery over disease control and equip themselves with problem-solving skills.\(^\text{12}\)

Participants for the program were recruited through practice registries of 16 general medical practices. The program included 6 educational sessions delivered once per week over
the course of 6 weeks. These sessions were conducted in a group setting by a diabetes educator trained in the curriculum. Each session lasted 2 hours with a total of 12 hours of education after completion of the entire program. Group sessions were held in accessible community venues and patients who missed a session received a telephone reminder before the next meeting. The instructors taught self-management skills through interactive methods with a diverse range of topics that included individual nutrition evaluation and portion control modeling, explanation of healthy nutrition choices through a supermarket tour, teaching of disease specific terminology, and reinforcement of key lessons through board games and quizzes. In addition, each education session ended with an individual assessment of barriers where participants set goals by completing a five-step empowerment model. This was all conducted using a resource manual that was given to patients for use during and after completion of the program.

**Evaluation**

To assess the efficacy of the program, a randomized controlled trial was conducted with a control group for comparison. A total of 314 individuals were enrolled in the study and randomized for treatment, with 157 participants in the X-PERT program and 157 in the control group. Individuals in the control group received individual appointments with a dietician, practice nurse and general practitioner. All outcomes were measured at baseline, 4 months and 14 months. The primary outcome identified prior to implementation was HgbA1c levels at 14 months; however other clinical, lifestyle and psychosocial measurements were also measured. At 14 months, the X-PERT program led to a reduction in the primary outcome, HgbA1c, of 0.6% which was both clinically and statistically significant when compared to the 0.1% increase in the control group. In addition, patients who participated in the X-PERT program showed significant improvement when compared with control patients for body weight, body mass index (BMI),
waist circumference and total cholesterol. Validated questionnaires used to assess lifestyle and psychosocial changes also showed that the program significantly improved diabetes knowledge, physical activity levels, foot care, fruit and vegetable intake, enjoyment of food, treatment satisfaction, and feelings of self-empowerment.

Overall this program was well-designed and implemented, and supports long-term improvements in disease control for patients with type II diabetes through group education. One major strength of the program is the incorporation of multiple theories in program design, including the utilization of an empowerment model which is unique when compared to other group education interventions. Additionally, the 14-month follow-up period is longer than that of other programs and supports long-term changes in significant biomedical and psychosocial outcomes well beyond the program delivery. Other strengths include the design for a primary care community with limited resources, delivery of the program in a community center setting and inclusion of individuals from multiple ethnic and socioeconomic backgrounds.

The major weakness of the study was the low participation rate from initial recruitment efforts (21.8%), which may represent a selection bias for individuals who are self-motivated. This was further supported by an average HgbA1c of 7.7% that indicated moderately well-controlled diabetes at baseline for all study participants. However, this does make the intervention unique as most other programs tend to focus on individuals with very poor disease control at baseline.
Diabetes Education for Black Women

Program

The program implemented and studied by D’Eramo et al. was designed for black women with type II diabetes seen in primary care practices in the United States, with a goal of improving glycemic control and increasing self-efficacy through diabetes self-management. The program was based on the framework of social learning theory and the trans-theoretical model of behavior change, emphasizing learning grounded in modifiable personal and environmental variables and evaluating an individual’s readiness to act with guidance through the stages of making individual behavioral changes.

Participants for the program were recruited from a primary care center in an urban community in New England through both provider referral and local advertisements. Participation was limited to black women aged 21-65 with exclusion criteria including insulin-requiring, non-treated psychiatric illness, BMI ≥ 37, presence of another serious illness or diabetes-related complication, and the inability to read and speak English. The program consisted of 11 sessions delivered over the course of 12 weeks. The first six education sessions were 2 hours each with a focus on diabetes self-management training that was culturally sensitive. This included identifying cultural barriers and beliefs that influence dietary choices and modifying social support systems to facilitate healthy behavioral decisions. Participants were also provided with materials to facilitate healthy lifestyle choices such as culturally-sensitive recipes and assisted in creating individual goals for lifestyle changes. The remaining five education sessions were 1 hour each and concentrated on coping skills techniques. These sessions were led by a clinical psychologist or psychiatric nurse practitioner and aimed to help
participants understand and manage stress through problem-solving strategies and communication techniques.

**Evaluation**

Individuals recruited for the study were randomized to participate in the intervention or control group. Control group participants had 10 weekly sessions of didactic, culturally neutral group diabetes education, with each session lasting 1-1.5 hours each. In addition to these treatments, all participants received primary care medical management every 3 months. 236 participants were identified for study inclusion, with 109 randomized after meeting exclusion criteria. Of these 109, 52 received the intervention and 57 were in the control group.

The study assessed both physiological (HgbA1c, blood pressure, lipid levels, weight) and psychosocial outcomes (anxiety scale, diabetes-related emotional distress, diabetes-specific social support, diabetes self-efficacy, diabetes knowledge, quality of life, health care provider support) at baseline and 3, 6, 9, 12, and 24 months after intervention initiation with laboratory tests and validated questionnaires. At baseline, the two study groups were comparable with a few exceptions including a higher HgbA1c in the control group (8.3% vs. 8.0%) and higher levels of somatic anxiety in the experimental group. Both study groups had dramatic declines in HgbA1c beginning at the 3-month time point (control: -0.93%, experimental: -0.70%) and extending until 12 months after study initiation (control: -0.88%, experimental: -0.82%). At 24 months, the decline in HgbA1c was maintained for the experimental group (-0.82%) but not for the control group (-0.30%). However, the difference between the two groups failed to reach statistical significance despite being clinically meaningful. In addition to this, participants in the intervention group had better physical quality-of-life and less diabetes-related emotional distress compared to participants in the control group.
This study suggests that culturally-sensitive, self-management education is effective in improving some psychosocial measures and possibly some biomedical outcomes when compared to didactic group education. The design of the program for an underserved population was one of its largest strengths as well as the culturally-sensitive approach taken with the creation of the curriculum. While this may limit the generalizability of actual materials used in the patient population, the theory of constructing an education program that is culturally-specific is unique in most other self-management education programs.

The major weakness of the study is the relatively small sample size which may have contributed to the inability to demonstrate statistically significant differences in HgbA1c levels in the control and intervention groups at 24 months. Additionally, the incomparability of the two study groups at baseline in regards to HgbA1c levels makes the decreases observed during the study more difficult to interpret and compare.

**IDEALL Project**

**Program**

The IDEALL project was designed for individuals with type II diabetes in a safety net health system called the Community Health Network of San Francisco. The goal of the program was to improve diabetes care for individuals in the health system while also improving a range of diabetes outcomes. The strategy for the program was deeply rooted in self-efficacy theory, promoting self-management skills for improved disease control.

Participants for the program were recruited from the health system type II diabetes registry. Patients were eligible if they had made one primary care visit within the last year and had a recent HgbA1c of ≥ 8.0%. The program consisted of monthly educational sessions
delivered in a group setting over the course of 9 months. These sessions were taught by a primary care physician and health educator and focused on personal empowerment and the belief that individuals have the ability to assess and solve their own problems. The beginning of each session included a time for self-reflection and barrier assessment and was followed by a group meeting that focused on individual empowerment and self-directed learning. Topics included exercise and relaxation, nutrition, medication monitoring, foot care, risk reduction and access to care. In addition to group sessions, participants were given homework assignments and developed action plans for tackling lifestyle goals beyond the intervention time period.

**Evaluation**

Individuals recruited for the study were randomized to participate in the group visit education or two separate control arms. Patients in the first arm received automated self-management telephone calls weekly over the 9-month study period. Through this system patients could leave responses that triggered recorded health education messages or a nurse follow-up phone call. Patients in the second arm received usual care with individual physician visits. 339 individuals enrolled in the study with 113 assigned to group visit care, 112 assigned to control arm 1 (telephone calls), and 114 assigned to control arm 2 (usual care).

The primary outcome for the study was improvement in self-management behaviors. Secondary outcomes measured included a patient assessment of the patient-centeredness of chronic disease care, diabetes self-efficacy, quality-of-life, HgbA1c levels, blood pressure and body mass index. All outcomes were measured at baseline and 12 months with laboratory tests or validated questionnaires. At 12 months, significant improvement in self-management behaviors was seen for individuals in the intervention group when compared to the control group who received usual care. This included increased physical activity, dietary changes and
increased frequency of disease-specific behaviors such as daily glucose checks. Additionally, the intervention group reported more patient-centered chronic disease care and a higher diabetes self-efficacy score than patients enrolled in the usual care group. For physiologic outcomes, HgbA1c and blood pressure improved substantially in the group care arm, but when compared to the two control groups the difference failed to reach statistical significance.

This study reaches conclusions about some unique measures that other group visit programs have not measured including the increased patient-centered nature of care provided by a group visit approach. Additionally, it targets an underrepresented, safety net population in primary care. One of the major weaknesses of the study was the participation rate. Of the patients assigned to the group visit intervention, only 69% attended at least one visit, with an average of 4.8 visits attended out of 9 for the entire study population. This study is unique in its population-based enrollment of participants which may produce a different study population than other programs who have targeted more self-motivated patients through advertisements. In addition, the study population was too small to detect a statistically significant difference in many of the outcome measures including physiologic data which limits the overall conclusions.

Joslin Clinic Program

Program

The Joslin Clinic program was designed for a diabetes clinic in the United States with the goal of helping patients with long-duration, poorly controlled type I or type II diabetes improve glycemic levels. The program was inspired by the successes of diabetes adherence and lifestyle interventions developed by behavioral scientists and psychologists. Specifically, the
program aimed to incorporate cognitive behavioral strategies through a structured behavioral intervention that included support for implementing self-care behaviors.

Participants for the program were recruited with advertisements in the clinic, locally and through mailings. Participation in the program was limited to individuals who had a diagnosis of diabetes for at least 2 years, were able to walk briskly, were on medical treatment for at least 1 year, were free of severe complications, and had a HgbA1c higher than 7.5%. The program consisted of 5 education sessions delivered over the course of 6 weeks in a group setting. These sessions were led by teams of diabetes nurses and dieticians who were also certified diabetes educators. Each education session lasted 2 hours for a total of 10 hours of education for the entire program. These sessions incorporated activities that focused on behavioral interventions including self-care goal setting, barrier assessment, and group review of glucose, nutrition and physical activity logs to identify strategies for improvement. In addition to the activities during sessions, participants were also assigned homework to prepare for the next meeting which often focused on assessment of individual behavioral choices such as dietary and exercise patterns.

**Evaluation**

A randomized controlled trial with two control groups was used to help assess the efficacy of the program. Individuals in the first control group received group education with similar core principles as the intervention program; however, this material was delivered in a didactic setting with no incorporation of cognitive behavioral strategies or individualized goal-setting activities. The second control group received unlimited access to individual appointments with a diabetes nurse or dietician for 6 months. A total of 222 individuals participated in the study and were randomized for treatment, with 74 individuals in the
behavioral intervention group, 75 individuals in the first control group (didactic group education), and 73 individuals in the second control group (access to individual consultations).

The primary outcome measured was HgbA1c levels. This was evaluated at baseline and 3, 6 and 12 months in the intervention group and first control group. In the second control group, this was measured at baseline and 5, 8 and 14 months. At the 3 and 5 month measurements, all groups had a significant reduction in HgbA1c averages; however, the group receiving the intervention demonstrated more improvement with a 0.8% decrease compared to the 0.4% decrease observed in both control groups. Sub-analysis was also completed for diabetes type, with type II diabetics having a more significant decrease of 0.7% compared to the 0.3% decrease observed in type I diabetics. At increased follow-up intervals, the average HgbA1c values increased slightly for each group but were still significantly lower than baseline at 14 months. Secondary outcomes measured included a validated assessment of diabetes self-care behaviors, mean 3-day pedometer readings, 24-hour diet recall, mean daily glucose checks, diabetes distress symptoms, emotion-based and controlled coping styles, self-efficacy, self-esteem, frustration with self-care, quality of life, cholesterol levels and body mass index. None of these secondary measures changed over time or differed significantly between different groups.

While overall this study suggests that all 3 treatment approaches may result in some improvement in glycemic index with short-term follow-up, group education based on behavioral strategies may lead to a larger improvement in disease control, especially in individuals with type II diabetes. The major strength of the study was the inclusion of two control groups as they allowed for individual comparisons of group education vs. access to individual consultations and a self-management approach vs. didactic instruction.
The main limitation of the study was the significant exclusion criteria used including: inability to walk briskly, presence of any severe complications, disease not dependent on medications, and the inability to read and speak English, among others. These exclusions reduce the generalizability of the study to other populations considerably. Additional weaknesses include different follow-up time periods for intervention and control groups and the volunteer-based recruitment strategy, as individuals in the study may represent a subset of the population more motivated to improve disease control.

**Conclusion**

All of the group education programs included in this review aimed to improve care for individuals with type II diabetes through similar approaches with a common focus on promoting self-management. While the programs were designed to deliver education across different time periods and at different intervals, there were many consistencies that allowed them to create measured improvements that ranged from physiologic outcomes to psychosocial measures. It is clear from this analysis that a successful program should incorporate theory into its design. There was some variability in the theoretical constructs used, but common themes of individual empowerment and social learning were identified as key components to success. Additionally, a focus on eliciting self-learning and encouraging individuals to identify their own barriers was a goal that most programs shared.

Some unique features of individual programs were also important for making them more successful than others. The culturally-sensitive approach taken by D’Eramo et al. was instrumental in improving many of the psychosocial outcomes associated with diabetes care. Another notable difference between programs was the target patient population which
demonstrated that patient motivation is clearly an important consideration in program achievement. Programs that relied on mainly volunteer-recruitment witnessed much larger improvements in outcome measures when compared to programs that took a more population-based recruitment strategy. Thus, finding a way to target individuals less motivated to participate in group visits may be a challenge that requires significant attention.
III. PROGRAM PLAN

Program Overview

Nationally, improving health literacy and increasing access to health information for individuals with chronic disease remains a priority as outlined in Healthy People 2020. In addition, Healthy People 2020 aims to increase personalized health information resources to help individuals manage their health. For diabetes specifically, the CDC’s Task Force on Community Preventive Services has put forth a recommendation that community gathering places be used as a setting to deliver diabetes self-management education. However, access to these educational opportunities is currently low, with 57.4% of individuals with diabetes reporting attendance at an educational class in 2010.

State organizations have taken these recommendations and initiated programs that aim to improve chronic disease education and health literacy. The NC Division of Public Health has committed to increasing access to diabetes education in all areas of the state through support of the American Diabetes Association. Under this initiative, 51 health departments have adopted a community education program for patients with diabetes.

On a local level, Orange County identified several key priorities in improving the health of individuals through the 2011 Orange County Community Health Assessment. Qualitative focus groups identified significant barriers to accessing accurate health information, specifically for underserved populations. Recommendations from the assessment include offering education classes to the community and ensuring health information is culturally appropriate for different patient populations. A current program that aims to address these goals is the Orange County Diabetes Self-Education management program. However, the resources of this program are limited and require patient financial support and provider referral.
The Bridge-to-Care group education program proposed will align with these national, state and local level goals, promoting increased health literacy for individuals with diabetes in the underserved population seen at the Student Health Action Coalition (SHAC) clinic by providing self-management education to promote lifestyle changes. The aim of this project is to further the goals outlined above, increasing access to these resources for individuals without financial means to afford such care, which are necessary under most of the current programs.

Findings from other community education groups support the effectiveness of this intervention in improving disease control and empowering individuals to adopt a healthier lifestyle. Using a comprehensive health education approach for diabetes including community sessions on patient-specific disease management, healthy diet and nutrition, and insurance options, a program will be designed and implemented over the next year.

Program Context

Although significant infrastructure currently exists in the form of an established clinic and patient population to support this project, there will undoubtedly be barriers to implementation that need to be considered. I have outlined potential obstacles to program implementation in an effort to anticipate problems and systematically address them in the design of the Bridge-to-Care group visit education program.

Political Environment

The passage of the Affordable Care Act has increased access to health insurance which has caused some concern for the role of free clinics like SHAC who provide care for the uninsured. However, the state of North Carolina decided to limit Medicaid expansion under the
Affordable Care Act in 2012, meaning a significant portion of individuals will remain without insurance and will be in need of the care provided by free clinics like SHAC. While the Affordable Care Act may change some of the patient population seen at SHAC, I do not anticipate the sustainability of the clinic being threatened by these changes.\textsuperscript{19}

\textit{Consistency with Local, State and National Priorities}

Priorities set by Healthy People 2020, the North Carolina Division of Public Health and the Orange County Community Health Assessment focus on increasing healthy literacy and patient education in individuals with chronic disease such as diabetes.\textsuperscript{3,17,18} Additionally, programs already in place to promote such goals include the Living Healthy Program and the Orange County Diabetes Self-Education management program which offer community-based programs to promote education on disease management and healthy lifestyle changes.\textsuperscript{3,20} The goals of these policies and programs strongly align with the focus of the Bridge-to-Care group education program.

\textit{Acceptability to Providers, Stakeholders and Recipients}

Other local programs exist that provide similar services including the Orange County Diabetes Self-Education management program.\textsuperscript{3} Prior to implementation, I will investigate this program to ensure the current project will reach other individuals in the community with no duplication of services. Support from clinic staff including physicians and volunteers is strong as providing care for chronic conditions strongly aligns with the mission of SHAC and its health disciplines.

Patient participation may be limited as the SHAC clinic has traditionally experienced relatively high no-show rates. To counter this, individuals will be offered incentives for
attending such as free blood pressure cuffs, glucose monitors and meals prepared through nutrition education. In addition, to ensure enough individuals will attend the group education visits to make them sustainable, our organization will partner with the UNC Family Medicine Clinic to open the visits to patients outside of the SHAC clinic that may also benefit from the program.

**Possible Financial Resources**

This project is not anticipated to require significant financial support as most of the resources required will be in volunteer time. However, funding for glucometers and blood pressure cuffs to provide patients with during disease education has been secured under funding for the acute SHAC clinic. The exact amount of funding is to-be-determined; however, this will be decided in the near future.

**Sustainability**

The most significant barrier in sustainability will lie in patient recruitment as discussed above as well as volunteer support. To continue as a functioning program, a leader committed to overseeing the program will need to be recruited as well as members to create and teach a curriculum. The larger organization that this program will fall under relies completely on student recruitment from each of the health care schools including the schools of medicine, public health, social work, pharmacy, and nursing. The SHAC organization has been functioning for over 50 years without any significant issues in volunteer support or funding. I do not anticipate any change in funding that would limit the scope or terminate the services provided by SHAC. If volunteer support cannot be maintained from these schools, the
opportunity may be extended to other students or members of the community interested in chronic disease management.

**Program Theories**

The success of the SHAC group visit education program for patients with diabetes will depend on understanding the influences of behavior at an individual level and developing educational material and interventions to help modify lifestyle decisions. As understanding behavior at an individual level is vital to ensuring the success of our intervention, implementing a program based on theories with that concentration will be essential for a successful design and evaluation. Based on this focus, the health belief model, stages of change model, and social learning theory provide an excellent framework for designing a program to facilitate behavioral change.

**Health Belief Model**

The Health Belief Model aims to understand an individual’s perception of a health problem, the benefits of facing it, and factors that may influence a decision to do so. The theory identifies six main constructs that influence decisions about a health behavior including: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy. Each construct can be used to design an effective educational program for patients with diabetes. We must design a curriculum that communicates the presence of disease even though individuals may be asymptomatic (susceptibility), emphasizes the negative consequences of poor disease control (severity), provides evidence for the positive effects of taking medication and adopting healthy lifestyle behaviors (benefits) while also identifying and removing any obstacles to taking these actions (barriers). Informational handouts, healthy
recipes and workout programs might help individuals adopt some of these behaviors (cues to action). Using the group to share success stories and ideas for improvement might also help boost the confidence of individuals who feel unable to make changes on their own (self-efficacy). This model will be essential for developing the curriculum for participants.  

Stages of Change Model

In addition to developing an effective curriculum, the success of the group education visits depends on the attendance of individuals recruited from the medical clinic. The Stages of Change Model explains behavioral change as a continuous process and provides insight into where individuals may be on that continuum for tailoring of recruitment strategies. The stages of change include pre-contemplation, contemplation, preparation, action and maintenance. If many individuals in the clinic are in the pre-contemplation stage, it may be hard to motivate them to attend the group education visits and strategies may be centered around moving them into the contemplation stage through clinic visit counseling. On the other hand, if many individuals are ready to attempt lifestyle changes for healthier behaviors, recruitment to the clinic may not be a substantial issue and more efforts may be focused on developing a curriculum that supports their motivation.  

Social Learning Theory

Both of the previous theories consider individual behavior in isolation, but doing so ignores the surrounding environment that may play a role in individual choices. The social learning theory incorporates this idea by taking into account the influence of an individual’s social environment on their behaviors. It will be important to consider the concepts outlined in the social learning theory in designing a program to promote lifestyle changes for disease
control. The key concepts of the social learning theory include reciprocal determinism, behavioral capability, expectations, self-efficacy, observational learning and reinforcement. Using this theory, development of the program should focus on empowering individuals with information that will enable them to change their diet, exercise and modify other behavioral risk factors (behavioral capability) while also taking into account their surroundings which may include barriers such as limited access to healthy food, financial restrictions, and limited social support systems, among many others (reciprocal determinism). In addition, education on results from behavioral modifications should be concrete and realistic (expectations) to inspire a confidence in participants for commitment and success (self-efficacy). Finally, the program should be designed with positive reinforcements such as providing free blood pressure cuffs, free meals with cooking demonstrations and access to counseling for exercise plans (observational learning and reinforcement).  

**Goals and Objectives**

**Goal:** To improve disease-specific attitudes, lifestyle behaviors and overall disease control of individuals with type II diabetes seen at the SHAC clinic in Carrboro, NC.

**Short Term Objectives:**

1. By April 2014, develop a curriculum for Bridge-to-Care group education visits

   **Activities:** Meet with the program coordinator for group education visits at Piedmont Health Services to discuss program design, barriers and concerns.

   **Activities:** Meet with leaders in each health discipline (nursing, public health, social work, physical therapy, pharmacy) at SHAC to identify primary focus areas.

2. By June 2014, train 2 students from each UNC health professional school to serve as health educators for the group education program.
Activities: Use current SHAC leaders in each health discipline (nursing, public health, social work, physical therapy, pharmacy) to identify and recruit individuals who will serve as health educators via an emailed application and interview process.

Activities: Hold a 1-day training session for health educators about the curriculum and effective self-management teaching skills.

Activities: Hold practice educational sessions for health educators with other students serving as participants

3. By year 1, group education visits with at least 5 participants will be occurring on a monthly basis for each disease state.

Activities: Participants will be recruited from those seen at SHAC clinic visits. During this time, the percentage of individuals who attend from the total number of patients referred will be tracked. After 6 months, the number of individuals attending will be evaluated and other arenas may be incorporated for patient recruitment (UNC Family Medicine).

4. By year 1, all patients participating in group education visits will score at least 75% on a disease knowledge, self-efficacy and attitudes assessment.

Activities: All program participants will be given a validated disease knowledge test before and after participation in the group visit program. Health educators will gather and analyze this data throughout the first year and will adjust the curriculum and teaching styles to improve the disease knowledge of participants.

5. By year 1, all patients participating in group education visits will show improvement in their diet and physical activity after education.
Activities: All program participants will be given a validated physical activity and diet assessment before, during and after participation in the group visit program. Health educators will gather and analyze this data throughout the first year and will adjust the curriculum and teaching styles to improve the behavioral changes of participants.

Long Term Objectives:

1. By year 3, 50% of patients seen at SHAC with diabetes will participate in group visits

   Activities: During year 3, program leaders will conduct an assessment of all patients seen at SHAC to determine how many have the chronic conditions studied and how many are attending group education visits.

2. By year 5, 50% of patients participating in the SHAC Bridge-to-Care group visits will meet recommended guidelines for disease control with a Hemoglobin A1C less than 7.0% or a blood pressure less than 140/90.

   Activities: In coordination with the clinic component of the Bridge-to-Care program, blood pressure measurements and Hemoglobin A1C values will be measured on a regular basis clinically. Data will be collected for both of these measurements before, during and after group visit participation.

Program Implementation

Activities

The success of the Bridge-to-Care group visits program in meeting the outlined goals and objectives will depend upon the stepwise implementation of activities, acquisition and strategic allocation of resources and promotion of sustainability. The activities required for successful implementation will be based on the five broad categories: designing a disease education
curriculum, volunteer recruitment and training, participant recruitment, program delivery, and continuous data collection. A detailed timeline for implementation can be seen in Appendix B.

*Designing a disease education curriculum*

The first short-term goal that must be met to ensure a successful program is the design of a curriculum for disease education. This will be initiated by meeting with program directors and instructors from local chronic disease education and management classes to gain a sense of what is currently being offered in the community. This assessment will include a detailed analysis of two local programs, the Diabetes Self-Management Education program offered by the Orange and Chatham County Health Departments and the Living Healthy program offered by both UNC Family Medicine and Piedmont Health Services. Strengths of the programs, population demographics and needs being met, and challenges will all be assessed.

After conducting this local assessment of services, the two program directors will organize a meeting with key stakeholders from each health discipline involved in SHAC to identify focus areas and barriers for the SHAC population. This will include representatives from nursing, public health, social work, physical therapy, occupational therapy, and pharmacy. The two program directors will use the information gained from the study of current curriculums
and feedback from interested stakeholders at SHAC to design a basic curriculum for the Bridge-to-Care program. This will also involve each key stakeholder developing lesson materials for an aspect of the curriculum that is specific to their specialty.

Volunteer Recruitment and Training

In addition to the two co-leaders already involved with program design and implementation, the program will require trained health educators from each professional school that will lead each educational session. Initially a minimum of two will be recruited from each discipline; however, if more individuals desire to participate, this may be expanded. Recruitment will be conducted by adapting the common application already used for SHAC volunteer recruitment to meet the needs of this specific program.

After health educators are identified, a one-day training session will be held to educate them on their curriculum. This will be accomplished by holding a common education session to cover goals of the program as well as separate educational sessions led by stakeholders who developed the curriculum for each professional discipline. After the training session, a separate practice meeting will be organized prior to any formal teaching sessions to ensure health educators are well prepared to deliver the curriculum.

Participant Recruitment

Initial recruitment of patients will be through clinical visits at the SHAC clinic. This will include patients enrolled in the new SHAC bridge-to-care chronic disease clinic as well as patients seen in the acute SHAC clinic. Patients will be recruited by the medical student serving as their primary provider during their visit. They will be provided with a handout and given basic information about the curriculum. Information about the curriculum will be made available
to all involved parties at SHAC through email and flyer advertisement. Continuous assessment of the success of this recruitment strategy will be conducted as described below, and if necessary recruitment strategies may be expanded to target other members of the community outside of the SHAC clinic.

Program Delivery

Adequate participant recruitment is the key to program success, and as mentioned above, we hope that the personal relationships formed between medical students and clinic patients will help with this process. The timing of the group visits will be at most weekly and at least monthly for each chronic condition. This may vary depending on the needs of the patient population and the curriculum designed. Additionally, special care will be taken to promote culturally-sensitive education for the significant Spanish-speaking population seen at SHAC. This may take the form of separate group visits for Spanish speakers with Spanish speaking students leading those visits to address the language barrier and deliver lifestyle education materials that are culturally-specific. The topic for each group visit will vary with a goal of creating a comprehensive program for patients. These topics will include, but are not limited to, nutrition and exercise, proper medication administration and adherence, mental health and coping with chronic disease, and insurance options. The goal of the group visit curriculum is to support self-management. Thus, the group visits will focus on interactive learning that goes beyond pure didactic instruction. We will also offer incentives for patients to attend visits including cooking demonstrations with groceries for each participant to make the meal at home, blood pressure cuffs, pill boxes, portion control plates, notebooks, and pencils.
Continuous Data Collection

To evaluate the program and ensure it is successful, multiple types of data will be collected continuously from program initiation through program maintenance for many years in the future. To assess the success of patient recruitment, the percentage of individuals who attend from the total number of patients referred will be tracked. This will ensure that the short-term goal of having regular group visits with at least 5 participants as well as the long-term goal of 50% of patients with chronic disease seen at SHAC attending group visits are being met.

The effectiveness of the curriculum on patient knowledge and behavioral choices will be assessed by giving all program participants a validated disease knowledge test and a validated physical activity and diet assessment before, during and after participation in the group visit program. Health educators will gather and analyze this data throughout the first year and will adjust the curriculum and teaching styles to improve the disease knowledge and behavioral choices of participants as needed.

Finally, clinical markers will be measured to assess the effectiveness of the program on disease control. Blood pressure measurements and Hemoglobin A1C values will be measured on a regular basis clinically. Data will be collected for both of these measurements before, during and after group visit participation.

Resources

The Bridge-to-Care group visit program will be a low-budget endeavor largely due to the current SHAC infrastructure that exists for support including a site for program activities, the dependence on student and faculty volunteers for program coordination and implementation, and the few resources required for delivery and sustainability. Funding in the amount of $3,000 has
already been secured through a grant provided by the North Carolina Albert Schweitzer Fellows program and will be used in the following ways.

Blood pressure cuffs ($40/each), portion control plates ($5/each), groceries ($20/participant), notebooks and pencils ($5/participant) will all be purchased for use in class and as incentives for participation in the classes. All photocopies and facility use will be covered under the existing SHAC infrastructure.

Sustainability

The scope of the program and its ability to meet a need that is currently unmet in the SHAC patient population make a highly sustainable program for the future. Furthermore, the incorporation of the program into an already existing clinical structure and organization make its potential for sustainability even greater. The challenges to sustainability will lie in continued volunteer and patient recruitment. The program co-leaders will take an active role in promoting both of these, ensuring that other students are engaged in program design, invested in program success for future years, and participants are recruited from a wide range of avenues and incentivized to participate.

Logic Model (Table 1)

ASSUMPTIONS

- Inadequate disease control is partially due to lack of disease-specific knowledge and lifestyle choices\textsuperscript{22,23}
- Improved disease knowledge and lifestyle modifications result in better disease control\textsuperscript{24,25}
- Patients and students will be motivated to participate in group education
- Local, state and national priorities support efforts to increase self-management education\textsuperscript{3,16}
<table>
<thead>
<tr>
<th>INPUTS</th>
<th>ACTIVITIES</th>
<th>OUTPUTS</th>
<th>OUTCOMES</th>
<th>IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>People:</strong></td>
<td>Meet with Piedmont Health Services group education coordinator</td>
<td>Increased cooperation between health professional students at SHAC</td>
<td><strong>Volunteers</strong>&lt;br&gt;Short-term (1-3 years):</td>
<td>Reduced health inequities between uninsured and insured in local community</td>
</tr>
<tr>
<td>• Program Leaders</td>
<td></td>
<td></td>
<td>• Increased competency for counseling on diabetes</td>
<td></td>
</tr>
<tr>
<td>• Volunteer Health Educators from professional schools (nursing, public health, social work, physical therapy, pharmacy)</td>
<td></td>
<td></td>
<td>• Improved teaching skills</td>
<td></td>
</tr>
<tr>
<td>• Program Participants</td>
<td>Develop aims/primary focus areas with SHAC professional school leaders</td>
<td>Developed curriculum for diabetes lifestyle education</td>
<td>Long-term (3-5 years):</td>
<td>Program expanded to include behavioral counseling for other chronic conditions</td>
</tr>
<tr>
<td></td>
<td>Develop curriculum</td>
<td>Established training for 2 health educators from each UNC health professional school each year</td>
<td>• Increased number of student volunteers at SHAC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recruit health educators</td>
<td>Established opportunity for counseling practice</td>
<td></td>
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<tr>
<td></td>
<td>1-day training conference for educators</td>
<td>Established monthly group visits for each disease</td>
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<tr>
<td></td>
<td>Practice educational sessions</td>
<td>Identified patients for participation</td>
<td></td>
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<tr>
<td></td>
<td>Recruit patients from SHAC clinical visits</td>
<td>Better characterization of patient population seen at SHAC</td>
<td></td>
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<tr>
<td></td>
<td>Assess number of patients at SHAC with diabetes and group visit participation rate</td>
<td>Determined effective patient recruitment strategies</td>
<td></td>
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<tr>
<td></td>
<td>Measure disease knowledge, self-efficacy, attitudes, Hemoglobin A1c and blood pressure</td>
<td>Increased efficiency of clinical visits at SHAC</td>
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</tr>
<tr>
<td><strong>Organizational:</strong></td>
<td></td>
<td></td>
<td><strong>SHAC Patient Population</strong>&lt;br&gt;Short-term (1-3 years):</td>
<td></td>
</tr>
<tr>
<td>• Student Health Action Coalition (SHAC) Clinic</td>
<td></td>
<td></td>
<td>• Healthier behaviors</td>
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<tr>
<td>• UNC School of Medicine</td>
<td></td>
<td></td>
<td>• Increased disease self-management behaviors</td>
<td></td>
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<tr>
<td><strong>Financial:</strong></td>
<td></td>
<td></td>
<td>• Increased disease-specific knowledge/self-efficacy/attitudes</td>
<td></td>
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<tr>
<td>• Private funding for SHAC clinic</td>
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<td></td>
<td></td>
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<tr>
<td>• Grant funding for SHAC clinic</td>
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<tr>
<td><strong>Infrastructure:</strong></td>
<td></td>
<td></td>
<td>Long-term (3-5 years):</td>
<td></td>
</tr>
<tr>
<td>• Piedmont Health Services building</td>
<td></td>
<td></td>
<td>• Increased percentage of SHAC patients receiving education</td>
<td></td>
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<tr>
<td><strong>Materials:</strong></td>
<td></td>
<td></td>
<td>• Increased percentage of SHAC patients meeting guidelines for disease control</td>
<td></td>
</tr>
<tr>
<td>• Blood pressure cuffs</td>
<td></td>
<td></td>
<td>• Sustained source of glucometers for SHAC patients with diabetes</td>
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<tr>
<td>• Curriculum manuals</td>
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<tr>
<td>• Paper</td>
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<tr>
<td>• Pencils</td>
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<tr>
<td>• Food</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td><strong>SHAC Clinic</strong>&lt;br&gt;Short-term (1-3 years):</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Increased number of new patients seen in</td>
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<td>acute clinic with transfer of education to a different setting</td>
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<tr>
<td>Long-term (3-5 years):</td>
<td>Sustained health education program for diabetes education at SHAC</td>
<td></td>
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</tr>
</tbody>
</table>
IV. EVALUATION PLAN

Evaluation Rationale

Evaluation of the Bridge-to-Care group visit program will be important for several reasons. Most importantly, it will allow us to measure the success of the curriculum design and initial implementation of group visits during the formative stages. This will include ensuring the program is acceptable to both program participants and key stakeholders. It will also be vital for monitoring progress toward program goals during this time and throughout the sustainability period in the future. Key stakeholders will be particularly interested in the ways the program is successful in meeting its goals and the areas that may be targeted for improvement. Finally, it will provide important results for current grant funding and justify further grant funding in the future.26,27

Evaluator’s Role

The program evaluation should be overseen by both an internal and external evaluator, as both individuals provide perspectives that will be beneficial. The internal evaluator will have necessary practical knowledge about the inner workings of the SHAC clinic, including its unique structure and patient population. Because the success of the program is based upon significant collaboration between students of different health care disciplines, the extensive knowledge held by the internal evaluator of the organizational structure of SHAC and its leaders will be imperative for effective evaluation of the program design. Additionally, the internal evaluator will be more familiar with the characteristics of patients that will be served by the program, allowing them to address the unique challenges of recruiting and providing care for this population. Finally, because of the internal evaluator’s integration into the clinic structure, they
will be more successful in communicating with leaders and health educators. This unique position will allow the internal evaluator to be more effective in collecting feedback from key stakeholders and program participants.

The external evaluator will ideally be an individual familiar with the goals and structure of group visit education, but lacking any specific knowledge or involvement with the SHAC clinic. An evaluator with this level of expertise will be best equipped with the technical skills that align with the goals of the program and its evaluation, but will benefit from an unbiased perspective due to the lack of any personal relationships or investments within the group of key stakeholders. The technical expertise of the external evaluator will enhance the lack of previous experience the internal evaluator will have with this type of program, and as such will be best at troubleshooting potential problems. Additionally, while the internal evaluator may be more effective at collecting feedback from program participants and key stakeholders, the external evaluator will be more successful at communicating with these individuals about program changes for improvement. The team of both evaluators should draw on both of their strengths and promote a successful evaluation by making communication a primary goal. Other necessary characteristics for both individuals will include flexibility, accountability, and the ability to listen to and incorporate feedback from many different individuals. Finally, both the internal and external evaluator should be identified early on in program design and implementation so that they can work with the program co-leaders and key stakeholders to design a successful evaluation plan.\textsuperscript{26}
Stakeholders

The key stakeholders that should be involved in program evaluation include program participants, Bride-to-Care program co-leaders, and leaders from each health discipline at SHAC. Representatives from each of these groups should be recruited and actively involved in program evaluation throughout the entire evaluation process. Having key stakeholders from each of the health disciplines generate questions specific to their area of expertise will ensure that the evaluation of the curriculum is well-rounded and comprehensive. Additionally, program co-leaders will be able to formulate important questions about the evaluation of the overarching structure and organization. Finally, program participants will be best at addressing the program’s ability to meet the needs of the target population.

Challenges

As with any other program, there will unquestionably be challenges during the evaluation process. Given the large number of health care disciplines involved, there will be many different opinions about what is important to include the program’s curriculum. Because of this, there may be some resistance from the health care educators of each discipline as their contributions to the curriculum are critiqued. The target population also makes evaluation more difficult as it will likely be more challenging to involve them in an entire program including the collection of both pre and post-participation evaluation data. Because participants may not attend every education session, we will likely need to utilize other means of collecting data including follow-up surveys in the mail and over the telephone.
**Evaluation Design**

The aims for the evaluation of the Bridge-to-Care program are to determine how well it is meeting its outlined objectives and primary goal of improving disease-specific knowledge, lifestyle behaviors and overall disease control for individuals with type II diabetes. Evaluation should focus on both program implementation and outcomes which will require observational and quasi-experimental approaches.\(^{27,28}\)

The implementation evaluation will be based on an observational approach with evaluation methods including document review, open-ended interviews, open-ended surveys, and focus groups. This will be most appropriate for this component because it requires an in-depth examination of how well the program is executed and functioning, and will be the best way to assess adherence to process objectives.\(^{28}\)

The outcome evaluation will be a combination of both observational and quasi-experimental approaches. For the quasi-experimental approach, there will be no control group for comparison to those receiving group visit education. Instead, pre and post validated assessments will be used for each participant. These data will be collected in a way that each individual’s data can be analyzed at both time points, allowing for the measurement of change resulting from program participation. This will be most useful for measuring participant knowledge, attitudes, and behaviors, and should provide evidence for how well the program is meeting its overall goal. An observational evaluation will be necessary for some outcome assessments that lack baseline measurements. Similar to the observational approach used for program implementation, for this part of the outcome assessment open-ended interviews, document review, open-ended surveys and focus groups will be used.\(^{27,28}\)
**Evaluation Methods**

Assessment of the Bridge-to-Care program will be done with both qualitative and quantitative methods. The qualitative methods include open-ended interviews, open-ended surveys, focus groups, and diet and exercise diaries. The quantitative methods include document review for patient attendance and scheduling, document review for clinical indicators and a pre and post disease knowledge, attitudes, and behaviors assessment.\[^{28}\]

Program evaluators will administer open-ended surveys and conduct open-ended interviews and focus groups with program participants, SHAC leaders, and health care educators. These assessments will evaluate the success of the curriculum design process, effectiveness of health educator training, acceptability of the program to all stakeholders and any barriers to implementation. Additionally, these assessments will be used to collect overall experiences for all involved stakeholders and address areas for improvement.

Review of program documents will also be essential for both implementation and outcome evaluation. This will allow evaluators to assess many measures including the comprehensiveness of the curriculum, the number of trained health educators, the number of group visits scheduled, the attendance rate at group visits, the effectiveness of recruitment strategies, the ability of the program to affect clinical indicators and the reach of the program to the whole clinic. Finally, weekly diet and exercise diaries and a pre and post disease knowledge, attitudes, and behaviors assessment will be given to participants to evaluate the ability of the program to improve these measures.
**Evaluation Planning Tables**

**Short-Term Objective 1:** (Process Objective)

By April 2014, develop a curriculum for Bridge-to-Care group education visits.

<table>
<thead>
<tr>
<th>Evaluation Questions</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>By April 2014, was a curriculum for Bridge-to-Care group education visits developed?</td>
<td>Program Directors</td>
<td>Document review of curriculum</td>
</tr>
<tr>
<td>How were the designs and barriers to other group education programs taken into account with curriculum design?</td>
<td>Program Directors Local Program Coordinators</td>
<td>Document review of local curriculums; review of meeting notes; open-ended interviews</td>
</tr>
<tr>
<td>Did any health disciplines decline to participate in curriculum design? If so, why?</td>
<td>Program Directors SHAC Leaders</td>
<td>Open-ended interviews</td>
</tr>
<tr>
<td>Did the final curriculum incorporate ideas from each health discipline?</td>
<td>Program Directors SHAC Leaders</td>
<td>Document review of local curriculums; review of meeting notes; open-ended interviews</td>
</tr>
<tr>
<td>Was the final curriculum acceptable to the leaders of all health disciplines?</td>
<td>Program Directors SHAC Leaders</td>
<td>Open-ended interviews</td>
</tr>
</tbody>
</table>

**Short-Term Objective 2:** (Process Objective)

By June 2014, train 2 students from each UNC health professional school to serve as health educators for the group education program.

<table>
<thead>
<tr>
<th>Evaluation Questions</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>By June 2014, were 2 students from each UNC health professional school trained to be health educators?</td>
<td>Program Directors SHAC Leaders Health Educators</td>
<td>Document review</td>
</tr>
<tr>
<td>Was using leaders in each health discipline an effective recruitment strategy?</td>
<td>Program Directors SHAC Leaders Health Educators</td>
<td>Open-ended interviews</td>
</tr>
<tr>
<td>Was an emailed application and interview process an effective way of identifying</td>
<td>Program Directors SHAC Leaders</td>
<td>Open-ended interviews</td>
</tr>
</tbody>
</table>
leaders for this program?

| Did the training session prepare health educators to lead the classes?  Is there a way to improve the training? | Program Directors  
Health Educators | Formal peer assessment; open-ended interviews |

Short-Term Objective 3: (Process Objective)

By year 1, group education visits with at least 5 participants will be occurring on a monthly basis for each disease state.

<table>
<thead>
<tr>
<th>Evaluation Questions</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>By year 1, how often were group visits occurring for each disease state?</td>
<td>Program Directors</td>
<td>Document review: group visit schedule</td>
</tr>
<tr>
<td>By year 1, how many participants attended group visits for each disease state?</td>
<td>Program Directors</td>
<td>Document review: group visit attendance record</td>
</tr>
<tr>
<td>How and from where were the participants recruited?</td>
<td>Program Directors</td>
<td>Document review: referral records, open-ended interviews</td>
</tr>
<tr>
<td></td>
<td>Program Participants</td>
<td></td>
</tr>
<tr>
<td>Was outreach to other clinics outside of SHAC required? If so, how successful was this approach?</td>
<td>Program Directors</td>
<td>Document review: referral records, meeting notes</td>
</tr>
<tr>
<td>On average, how many visits did each participant attend?</td>
<td>Program Directors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Health Educators</td>
<td></td>
</tr>
<tr>
<td>What barriers did participants face in attending group visits? Can these be addressed to improve attendance?</td>
<td>Program Directors</td>
<td>Surveys, open-ended interviews, focus groups</td>
</tr>
<tr>
<td></td>
<td>Health Educators</td>
<td></td>
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<tr>
<td></td>
<td>Program Participants</td>
<td></td>
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<tr>
<td>Do group visit participants feel that attending the education sessions is important?</td>
<td>Program Directors</td>
<td>Surveys, open-ended interviews, focus groups</td>
</tr>
<tr>
<td></td>
<td>Health Educators</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program Participants</td>
<td></td>
</tr>
<tr>
<td>What measures can be taken to improve attendance at group visits?</td>
<td>Program Directors</td>
<td>Meeting notes, surveys, open-ended interviews, focus groups</td>
</tr>
<tr>
<td></td>
<td>SHAC Leaders</td>
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<tr>
<td></td>
<td>Health Educators</td>
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<td></td>
<td>Program Participants</td>
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</table>

Short-Term Objective 4: (Outcome Objective)
By year 1, all patients participating in group education visits will score at least 75% on a disease knowledge, self-efficacy and attitudes assessment.

<table>
<thead>
<tr>
<th>Evaluation Questions</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>By year 1, what percentage of patients participating in group education visits score at least 75% on a disease knowledge, self-efficacy and attitudes assessment?</td>
<td>Program Directors Health Educators Program Participants</td>
<td>Pre/Post validated assessment tool</td>
</tr>
<tr>
<td>Are educational materials appropriate to patients’ health literacy levels?</td>
<td>Program Directors Health Educators Program Participants</td>
<td>Validated health literacy assessment, surveys, open-ended interviews, focus groups</td>
</tr>
<tr>
<td>How can educational efforts be improved?</td>
<td>Program Directors SHAC Leaders Health Educators Program Participants</td>
<td>Open-ended interviews, surveys, focus groups</td>
</tr>
<tr>
<td>Is the curriculum addressing all of the measurements of the assessment? If not, how can this be improved?</td>
<td>Program Directors SHAC Leaders Health Educators Program Participants</td>
<td>Document review: curriculum, validated assessment tool</td>
</tr>
</tbody>
</table>

Short-Term Objective 5: (Outcome Objective)

By year 1, all patients participating in group education visits will show improvement in their diet and physical activity after education.

<table>
<thead>
<tr>
<th>Evaluation Questions</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>By year 1, what percentage of patients participating in group education visits show improvement in their diet and physical activity after education?</td>
<td>Program Directors Health Educators Program Participants</td>
<td>Validated assessment tool, diet and exercise diary</td>
</tr>
<tr>
<td>How can the program be improved to better promote changes in diet and physical activity?</td>
<td>Program Directors Health Educators Program Participants</td>
<td>Validated assessment tool, diet and exercise diary, survey, open-ended interview, focus groups</td>
</tr>
<tr>
<td>What barriers are participants facing in improving diet and physical activity? What changes can be made to</td>
<td>Program Directors Health Educators Program Participants</td>
<td>Surveys, open-ended interviews, focus groups</td>
</tr>
</tbody>
</table>
address these barriers?

Long-Term Objective 1: (Process Objective)

By year 3, 50% of patients seen at SHAC with diabetes will participate in group visits

<table>
<thead>
<tr>
<th>Evaluation Questions</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>By year 3, what percentage of patients seen at SHAC with diabetes participated in group visits?</td>
<td>Program Directors</td>
<td>Document review: SHAC patient log, group visit attendance record</td>
</tr>
<tr>
<td>What barriers did participants face in attending group visits? Can these be addressed to improve attendance?</td>
<td>Program Directors, Health Educators, Program Participants</td>
<td>Open-ended interviews, surveys, focus groups</td>
</tr>
<tr>
<td>Are all medical teams working with patients at SHAC aware of the group visit program? How can awareness be increased?</td>
<td>Program Directors, SHAC Leaders</td>
<td>Focus groups, surveys</td>
</tr>
</tbody>
</table>

Long-Term Objective 2: (Outcome Objective)

By year 5, 50% of patients participating in the SHAC Bridge-to-Care group visits will meet recommended guidelines for disease control with a Hemoglobin A1C less than 7.0% or a blood pressure less than 140/90 6 months after finishing the program.

<table>
<thead>
<tr>
<th>Evaluation Questions</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>By year 5, what percentage of patients that participated in group visits met recommended guidelines for disease control 6 months after finishing the program?</td>
<td>Program Directors</td>
<td>Document review: clinical indicators</td>
</tr>
</tbody>
</table>
The Bridge-to-Care group visits project is a novel idea for a student-run clinic. Because of this, one of the goals in evaluation of the project is to share results with others through presentations and publications of the evaluation data.\textsuperscript{27,28} Evaluation of the group visits themselves will offer minimal risk to patients as it will be based on interviews, focus groups and surveys. Research data will be collected through the form of pre and post intervention assessments and standard clinical indicators. Due to the intent of publication and collection of research data, acquiring Institutional Review Board (IRB) approval early in the evaluation process will ensure that data can be collected and shared in a timely manner.\textsuperscript{27}

Prior to participation, informed consent will be obtained from all patients and will include the risks and benefits of participation. One of the main risks to consider will be upholding confidentiality of the data collected. Program directors will be involved in data collection and interpretation and thus, measures will need to be taken to ensure patient data is confidential at all times. The IRB recommendations for this will be followed through de-identification of any collected data before entry into a database for analysis and maintained anonymity of any published results. All program staff and evaluators will also complete Human Subjects Training prior to any participation in data collection or analysis. Application for an expedited review will be completed as there is minimal risk to participants and collection of clinical data will not be done outside of routine clinical management.

**Dissemination**

The dissemination of evaluation results will be important for long-term support of the program and continued improvement. The first step to ensure optimal functioning of the
program is to provide regular evaluation results to key stakeholders and decision makers. Doing this on a routine basis will promote ongoing discussion about program process and improvement. This will be accomplished by presenting evaluation results in the form of PowerPoint presentations at stakeholder meetings held every few months throughout the initial implementation phase and at least twice yearly after initial implementation. In addition to this, bi-annual reports will be written for dissemination to all clinic staff.27

We will also provide information to individuals not directly involved with the program. Brief summaries in the form of oral reports will be shared quarterly at local meetings held for individuals involved in chronic disease group education programs. Final evaluation findings will also be written up for publication and submitted for presentation at national conferences so that results can be shared with other student-run clinics and interested academic parties. By disseminating this information widely we hope to deliver guidelines for other student-run clinics to implement a group visit program and identify our successes, failures and barriers for future improvement.27,28
V. DISCUSSION

The increasing prevalence of diabetes and diabetes-related health complications is an escalating problem, especially in underserved populations which share a disproportionate burden of the disease and its ill effects. In any patient population, teaching self-management skills and healthy lifestyle behaviors are both critical components to ensuring adequate disease control. In the underserved and uninsured population, this becomes particularly salient and challenging as there is often lack of access to services.

Self-management training and lifestyle counseling have the greatest potential for improving disease control and preventing negative health outcomes, yet presently most of the patients seen at SHAC are primarily treated with medications, with little attention being given to individual counseling and no formal approach to disease education. The Bridge-to-Care Group Visit program seeks to fill this unmet need with a primary goal of improving disease-specific knowledge, lifestyle behaviors and overall disease control for individuals with type II diabetes. This will be accomplished through interdisciplinary-led group visit education sessions which aim to equip participants with lifelong skills that will have a significant impact on their ability to effectively manage their disease in the present and future.

The literature review of similar programs identified five diabetes self-management group education programs that showed some promise for creating measured improvements ranging from physiologic outcomes to psychosocial measures. While the programs were all different in their scope and design, the Bridge-to-Care initiative attempts to combine many of their strengths while also featuring approaches that will be best suited for the unique patient population it will serve.
Because programs that incorporated theory into their design had more successful outcomes, the foundation of the Bridge-to-Care program was heavily based on theoretical constructs that will strongly facilitate behavioral change including the health belief model, the stages of change model, and the social learning theory. This will undoubtedly be one of its strengths. Programs that were less successful in promoting change targeted populations that were more difficult to recruit and did not rely on volunteerism for participation. As Bridge-to-Care aims to target all underserved patients seen at SHAC, careful attention was given to improve on this weakness by designing a program that will involve continuity with patients and incentivize participation.

Because the Bridge-to-Care program is a unique endeavor for a free student-run clinic, a full evaluation will be important as it will offer the opportunity to advise others about what aspects of the program were successful, what can be improved upon, and how a similar program can be successfully implemented in other student-run clinics. The comprehensive evaluation plan outlined previously will meet this goal by looking at both short-term and long-term objectives and considering the interests of all key stakeholders. It will also aid in quality improvement and ensure the program is providing a service that is best meeting the needs of all participants. To this end, the evaluation will incorporate both quantitative and qualitative data, as both will be essential for assessing program outcomes and implementation.

Although the program plan and evaluation for Bridge-to-Care have been carefully constructed to promote success, this will unquestionably depend on several key factors. Most importantly, patient recruitment and participation will need to be maintained. The evaluation will be instrumental in continuously assessing this challenge and developing new ways to approach it. Finally, as the program is entirely student-initiated and managed, new leadership
will need to be recruited and special attention will need to be given to ensure the transition process does not disrupt the sustainability of the Bridge-to-Care program in the future.
VI. ACKNOWLEDGEMENTS

I would like to thank the following people, all of whom were vital to the success of the planning and implementation of the Bridge-to-Care program as well as the writing of this master’s thesis:

Laura Cone

Diane Calleson, PhD

Sherry Hay, MPA

Anthony Viera, MD/MPH

Anne Mounsey, MD
VII. REFERENCES


Table 1. Summary of Diabetes Group Education Programs

<table>
<thead>
<tr>
<th>Authors</th>
<th>Program and Goal</th>
<th>Study Population</th>
<th>Program Structure (Leaders; frequency; length)</th>
<th>Comparison Treatment</th>
<th>Evaluation (Outcomes measured; time measured)</th>
<th>Results</th>
<th>Strengths and Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davies et al.</td>
<td>DESMOND To measure whether an educational program based on self-management education produces sustained changes in health for individuals with newly diagnosed type II diabetes</td>
<td>824 adults with newly diagnosed type II diabetes seen in primary care in the United Kingdom Mean age = 59.0 years Mean disease duration = not measured Mean HgbA1c = 8.3% ± 2.2%</td>
<td>2 trained healthcare professional 1 day or 2 half-days (1 or 2 sessions) 6 hours total</td>
<td>Access to equivalent amount of individual counseling with provider</td>
<td>Physiological: Glycated HgbA1c, blood pressure, weight, blood lipid levels Lifestyle/Psychosocial: smoking status, physical activity, quality of life, beliefs about illness, depression, emotional impact of diabetes</td>
<td>Greater weight loss, lower smoking rate, lower depression score, improvements in illness beliefs with intervention</td>
<td>Strengths: large number of participants, strong generalizability Weaknesses: baseline differences in treatment groups, study design that may not represent real-world feasibility</td>
</tr>
<tr>
<td>Deakin et al.</td>
<td>X-PERT Program To assess the effectiveness of a group education program based on theories of empowerment and discovery learning on clinical, lifestyle and psychosocial outcomes.</td>
<td>314 adults in the United Kingdom with type-2 diabetes Mean age = 61.3 ± 9.7 years Mean disease duration = 6.7 ± 6.4 years Mean HgbA1c = 7.7% ± 1.6%</td>
<td>Diabetes research dietician Every week for 1.5 months (6 sessions) 2 hours each (12 hours total)</td>
<td>Individual medical appointments</td>
<td>Primary outcome:HgbA1c Secondary outcomes: increase or decrease in diabetes medication use, body weight, body mass index (BMI), waist circumference, total cholesterol, self-empowerment, diabetes knowledge, physical activity levels, foot care, fruit and vegetable intake, enjoyment of food and treatment satisfaction.</td>
<td>At 14 months: Improved glycemic control, reduced total cholesterol level, body weight, BMI and waist circumference, reduced requirement for diabetes medication, increased consumption of fruit and vegetables, enjoyment of food, knowledge of diabetes, self-empowerment, self-management skills and treatment satisfaction</td>
<td>Strengths: long-term follow-up, theory-driven, primary care community, diverse patient population Weaknesses: potential selection bias for self-motivation, baseline HgbA1c 7.7%</td>
</tr>
<tr>
<td>Authors</td>
<td>Program and Goal</td>
<td>Study Population</td>
<td>Program Structure (Leaders; frequency; length)</td>
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<td>Strengths and Weaknesses</td>
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<tr>
<td>D'Eramo et al.</td>
<td>To evaluate the effectiveness of a culturally relevant, nurse-led diabetes self-management group education with coping skills training for black women with type II diabetes seen in primary care</td>
<td>109 black women with type II diabetes in primary care Mean age = 48.4 ± 9.0 years Mean disease duration = not measured Mean HgbA1c: Control = 8.3% ± 2.2% Intervention = 8.0% ± 2.1%</td>
<td>Clinical psychologist, psychiatric nurse practitioner 11 sessions over 12 weeks First 6 sessions were 2 hours each, last 5 sessions were 1 hours each (17 hours total)</td>
<td>10 weekly sessions of didactic, culturally neutral group diabetes education (1-1.5 hours each) followed by question and answer sessions</td>
<td>Physiological: HgbA1c, blood pressure, lipid levels, weight Psychosocial: Anxiety, diabetes-related emotional distress, diabetes-specific social support, diabetes self-efficacy, diabetes knowledge, quality of life, health care provider support Baseline, 3 months, 6 months, 9 months, 12 months, 24 months</td>
<td>Physiological: Declines in HgbA1c sustained longer in intervention group but not statistically significant. Psychosocial: Significant improvement in physical quality-of-life and less diabetes-related emotional distress</td>
<td>Strengths: culturally-sensitive design for underserved population Weaknesses: non-significant physiological outcomes secondary to small sample size</td>
</tr>
<tr>
<td>Schilling er et al.</td>
<td>IDEALL (Improving Diabetes Efforts Across Language and Literacy) To assess the effectiveness of the IDEALL model to improve diabetes care and outcomes when compared to usual care</td>
<td>339 adults with poorly-controlled type 2 diabetes seen in primary care in the United States Mean age = 56.1 ± 12.0 years Mean disease duration = 9.5 ± 7.4 years Mean HgbA1c = 9.5% ± 2.0%</td>
<td>Primary care physician and health educator Every month for 9 months (9 sessions) 1.5 hours each (13.5 hours total)</td>
<td>1. weekly automated telephone self-management calls 2. usual care</td>
<td>Primary outcome: change in self-management behavior Secondary outcomes: patient-centeredness of chronic disease care, diabetes self-efficacy, quality-of-life, HgbA1c, blood pressure, BMI Baseline, 12 months</td>
<td>Improvements with intervention in patient-centeredness of chronic disease care and self-management behavior when compared to usual care.</td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>Program and Goal</td>
<td>Study Population</td>
<td>Program Structure (Leaders; frequency; length)</td>
<td>Comparison Treatment</td>
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<tr>
<td>Weinger et al.</td>
<td>Joslin Clinic Program &lt;br&gt;To test the efficacy of a behavioral diabetes intervention in improving glycemic control in patients with long-term, poorly controlled diabetes</td>
<td>222 adults with type I and type II diabetes in the United States &lt;br&gt;Mean age = 53 ± 12 years &lt;br&gt;Mean disease duration = 18 ± 12 years &lt;br&gt;Mean HgbA1c = 9.0% ± 1.1%</td>
<td>Certified diabetes educator &lt;br&gt;5 sessions over 1.5 months &lt;br&gt;2 hours each (10 hours each)</td>
<td>1. Curriculum-based, standard group education  &lt;br&gt;2. Unlimited access to individual diabetes nurse and dietician visits for 6 months</td>
<td>Primary outcome: HgbA1c &lt;br&gt;Secondary Outcomes: diabetes self-care behaviors, mean 3-day pedometer readings, 24-hour diet recall, mean daily glucose checks, diabetes distress symptoms, emotion-based and controlled coping styles, self-efficacy, self-esteem, frustration with self-care, quality of life</td>
<td>Improved HgbA1c levels compared to control groups (-0.8% vs. -0.4% vs -0.4%). &lt;br&gt;No difference in quality of life, glucose monitoring, and frequency of diabetes self-care.</td>
<td>Strengths: two control groups (didactic group education and individual consultation) &lt;br&gt;Weaknesses: significant exclusion criteria with limited generalizability, unequal follow-up times between groups, potential selection bias with volunteers recruited</td>
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</table>
## IX. Appendix B. Implementation Timeline

<table>
<thead>
<tr>
<th>Activity</th>
<th>Personnel</th>
<th>Timeline</th>
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</thead>
<tbody>
<tr>
<td>Meet with program directors and instructors from local chronic disease</td>
<td>Program co-leaders</td>
<td>Month 1</td>
</tr>
<tr>
<td>education and management classes</td>
<td>Local leaders</td>
<td></td>
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<tr>
<td>Access local programs</td>
<td>Program co-leaders</td>
<td>Month 1-4</td>
</tr>
<tr>
<td>Meet with key stakeholders from each health discipline involved in</td>
<td>Program co-leaders</td>
<td>Month 3</td>
</tr>
<tr>
<td>SHAC</td>
<td>SHAC leaders</td>
<td></td>
</tr>
<tr>
<td>Design a basic curriculum</td>
<td>Program co-leaders</td>
<td>Month 2-4</td>
</tr>
<tr>
<td>Obtain resources for program incentives</td>
<td>Program co-leaders</td>
<td>Month 4</td>
</tr>
<tr>
<td>Recruit Health Educators</td>
<td>Program co-leaders</td>
<td>Month 4</td>
</tr>
<tr>
<td>SHAC leaders</td>
<td>SHAC volunteers</td>
<td></td>
</tr>
<tr>
<td>Train Health Educators</td>
<td>Program co-leaders</td>
<td>Month 5</td>
</tr>
<tr>
<td>SHAC leaders</td>
<td>Health Educators</td>
<td></td>
</tr>
<tr>
<td>Hold Practice Education Sessions</td>
<td>Program co-leaders</td>
<td>Month 5</td>
</tr>
<tr>
<td>SHAC leaders</td>
<td>Health Educators</td>
<td></td>
</tr>
<tr>
<td>Advertise New Program to SHAC</td>
<td>Program co-leaders</td>
<td>Month 3-6</td>
</tr>
<tr>
<td>Recruit Patients</td>
<td>Program co-leaders</td>
<td>Month 5-ongoing</td>
</tr>
<tr>
<td>SHAC leaders</td>
<td>SHAC leaders</td>
<td></td>
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<tr>
<td>volunteers</td>
<td>Health Educators</td>
<td></td>
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<tr>
<td>Hold group visit sessions</td>
<td>Program co-leaders</td>
<td>Month 6-ongoing</td>
</tr>
<tr>
<td>Collect Data</td>
<td>Program co-leaders</td>
<td>Month 6-ongoing</td>
</tr>
<tr>
<td></td>
<td>Health Educators</td>
<td></td>
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