Program Plan and Evaluation for SHAC Bridge-to-Care Clinic: A Free Student-Run Clinic for Diabetes and Hypertension at the University of North Carolina, Chapel Hill

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ABSTRACT

The SHAC Bridge-to-Care Clinic is a free student-run clinic for patients with diabetes and hypertension at the University of North Carolina at Chapel Hill. The program provides continuity of care until patients are able to establish long-term care with a local primary care provider. The program plan for the Bridge-to-Care clinic outlines the goals and development of the clinic. The program evaluation will be used to ensure the program is successfully meeting its goals and to identify improvements in the program. The Bridge-to-Care clinic is a model for chronic disease management in a free student-run clinic.

INTRODUCTION

Diabetes and hypertension are some of the most common chronic diseases among the United States (US) population. As of 2013, 11.3% of adults over 20 years old had diabetes with projections of 1 in 3 adults having diabetes by 2050 if trends continue.\textsuperscript{1} Hypertension is even more prevalent than diabetes with 28% of the US adult population being hypertensive.\textsuperscript{2} Diabetes and hypertension can lead to multiple comorbidities including cardiovascular disease and ultimately, death. Both of these diseases require ongoing management by a primary care team to ensure secondary complications are prevented. However, because many patients are uninsured, they lack access to an affordable primary care physician and often forego care.

The student-run clinic “Student Health Action Coalition” (SHAC) is a free clinic established in 1968 at the University of North Carolina, Chapel Hill (UNC). It is the nation’s oldest student run clinic. Currently, the clinic operates one evening per week and provides mostly acute care to patients. Of those patients seen at SHAC, approximately 40% have either diabetes or hypertension.\textsuperscript{3} All patients with chronic diseases are referred to community primary
care providers. However, it takes approximately two to six months before a primary care provider outside of SHAC can see these patients because of the number of patients seeking care. These patients often do not receive any health care during the interim.

Based on this need of patients already seen at SHAC and the needs identified by the Orange County Health Department, the SHAC Bridge-to-Care clinic is proposed in this paper as a means to expand SHAC’s services by providing more continuity of care to patients with diabetes and hypertension. The overall goal of the program is to improve the health of adult patients with chronic diseases in Orange County, North Carolina. To reach this goal, a clinic will be established one evening a week for identified patients with diabetes and hypertension. The same medical student and pharmacy student volunteers will see patients for a year, allowing for continuity of care. It will be completely student-run with oversight from UNC clinical faculty. Education group visits will also be provided as part of the Bridge-to-Care program but will be discussed in another paper. The program will be evaluated throughout implementation to ensure success and sustainability.

This paper begins with a systematic review to identify existing literature on free clinics that provide care for patients with chronic diseases such as diabetes and hypertension. After review of these programs, I identified aspects that may be beneficial in the design of the Bridge-to-Care clinic program and developed a program plan, including program context, rationale, theories, and goals. I also included a program logic model, budget, and implementation plan. This paper also includes a plan to evaluate the program, including the rational, design and methods, and dissemination plan. Finally, this paper concludes with the potential strengths and weaknesses of the program outlined as well as Bridge-to-Care’s future implications.
SYSTEMATIC REVIEW

Research Question

For the literature review, my research question is “What are some current examples of management of chronic care in free clinics, particularly student-run clinics, and what can be learned from their success or failures?”

Search Strategy

Because of the nature of the very specific population the clinic will be targeting, I conducted a preliminary search in PubMed for “free clinic” OR “student run clinic”, yielding 207 results. I filtered articles to include only review articles and clinical trials and further filtered to include diabetes or hypertension. I reviewed article titles and abstracts for applicability and identified a total of three articles. I reviewed each of these three articles’ references, and one other article was identified. A similar search strategy in Web of Science yielded no other new, applicable results. A search in Google Scholar yielded one other article. I included articles that met the following criteria:

1. The article was in English
2. The article discussed a program or clinical trial
3. The program or trial was in a free clinic or student-run clinic
4. The program or trial included diabetes, hypertension, or transition to primary care physicians
Summary of Programs

The UCSD student-run free clinic project: Transdisciplinary health professional education. (Beck 2005)

Program

The University of California, San Diego’s (UCSD) Student-Run Free Clinic Project was established in 1996 as a small community project to provide clinical care for the homeless. Since then, it has evolved to become a large-scale program, providing a variety of services to a more diverse population. The project still runs on its founding mission of (1) providing healthcare for the underserved (2) providing medical teaching and training and (3) raising awareness.

At the time of publication of this article, the four clinics operated a total of four nights a week, with two clinic nights at a school, one downtown, and one in a more suburban beach area. They also had a “street homeless outreach team” actively recruiting homeless patients and providing basic education on population-specific health. Other health care providers besides medical professionals and students also played a large role in caring for patients. These providers include students and faculty from a local acupuncture school, pharmacy students and faculty, nurse practitioners, social workers, mental health providers, specialty medical care providers, and community dentists. Funding was provided by the federal government, many community and larger charitable organizations, the university, and many grants.

The target population of the program was the underserved, specifically those with no health insurance. They were particularly serving the “working poor,” those patients that essentially fall into a gap where they cannot afford health insurance but earn too much income to qualify for county medical services. The clinics’ population also included many homeless (36.2%) and undocumented patients. In 2004, the clinic saw 767 patients for a total of 2,699
visits. Of this population, 24.8% were employed, most were middle age, and 52.7% were Hispanic.

The medical clinic appears to have provided both acute and chronic care to patients with more focus on chronic care. The top two chronic diseases reported were hypertension and diabetes. The article specifically reports most patients seen at the clinic sites were followed for ongoing care. In fact, the clinic gave established patients priority over new patients. This allows for some continuity of care provided by the clinic. However, the patient was not guaranteed to see the same students or provider at each visit because students typically volunteered for only one month as a clinical elective.

The clinic had measures in place to ensure patients were taking advantage of all community programs available to them. They screened each patient and referred to government-sponsored programs or insurance if the patient qualified. This ensured patients seen in the clinic were only those who had no other options for care, maximizing the number of community members who could receive care. UCSD used case management services to help with this referral process and to address any other patient resource needs.

**Evaluation**

The major outcomes measured include quality of well being, disease-specific measurements consistent with standard of care, and student attitudes and career choices. The Quality of Wellbeing Scale (QWB-SA), a validated measurement tool, was used by the clinic to help determine a patient’s views on their individual quality of life and assess quality adjusted life years. Disease-specific measurements were also used to monitor patient health. In concordance with standard care, Hemoglobin A1c (HgbA1c) and blood pressure levels were
monitored for diabetes and hypertension, respectively. Neither QWB-SA scores nor disease-specific measures were reported in this article.

To address the goals of providing medical training and increasing awareness of underserved patient’s needs, the article assesses student attitudes to working with the underserved and homeless as well as long-term career choices. Although full data are not published, the article reports students who volunteered at the free clinic were more likely to have acquired more positive attitudes to working with the underserved and homeless than students who had not taken an elective to work in the clinic. This was assessed by a pre and post assessment questionnaire.

**Strengths/weaknesses**

The UCSD Student-Run Free Clinic Project has many strengths, particularly that it provides a variety of clinical services on many nights during the week to a diverse group of underserved patients. It also allows students to learn and appreciate care for this population. They have a strong continuity of care for established patients with chronic conditions such as diabetes and hypertension but lack continuity with providers given the transient volunteer base. This system allows for more thorough patient care by providing follow-up visits but does sacrifice the ability of the clinic to reach the greatest number of people in need because many patients have to be turned away. Another weakness of the program is its lack of clearly defined outcome measurements and evaluation. However, this article is limited in its description of outcomes likely because outcomes remain internal to clinic operations.
Patient transition from a free clinic to a medical home. (Bowen et al. 2013) 6

Program

The student-run clinic Einstein Community Health Outreach (ECHO) at the Albert Einstein College of Medicine in the Bronx, New York piloted a program in a trial to encourage patient transition from the student-run clinic to an Institute for Family Health (IFH) primary care site. The IFH is a federally qualified health center located in the community. The goal of the program was to increase continuity of care for patients. The authors do not describe the services provided by the student-run clinic ECHO or the IFH primary care clinic but rather focus on a particular intervention of limiting the number of visits allowed at the student-run clinic. They also do not provide any information on the patient population.

The program established an intervention group of 25 diabetic patients seen in ECHO between July 1, 2009 and June 30, 2011. This group was only allowed to be seen at ECHO for two visits. The control group was 25 diabetic patients seen between January 1, 2007 and December 31, 2008 and was allowed to be seen in the ECHO indefinitely. Both the program group and the control group received referrals to the IFH primary care clinic and reminders about appointments. The authors report the intervention and control group had similar characteristics but do not describe these patient characteristics.

Evaluation

In order to evaluate the program, a retrospective chart review of both groups was performed to assess visit gaps, time between patient visits to either clinic, as well as “linkage effectiveness.” Linkage effectiveness was defined as the proportion of patients who had an appointment in IFH primary care. Continuity of care was assessed by time between visits, “visit gaps.” Visit gaps greater than 90 days were considered to be detrimental to continuity.
The results of the program showed the two-visit limit at ECHO decreased both continuity and the number of patient visits. Compared to the control group, the program group had fewer patient visits (2.96 vs 4.44, p=0.1181) and worse patient continuity (73% vs 93% visit gaps <90 days, p=0.081), although neither was statistically significant. Of note, patients successfully referred to the IFH primary care clinic were typically older than those lost to follow-up (p=0.0068).

**Strengths/Weaknesses**

Some strengths of the trial include the fact that both groups are reportedly comparable and received the same process of referral. The trial has a lot of room for selection bias and confounding because there was no randomization or discussion of missing data and drop out rates. The very small sample size, often a limiting factor in trials performed in student-run clinics, can also lead to confounding, reducing the ability to apply it to other clinics. It may have been useful to ask patients if they were seeking health care outside of these two clinics as well. Overall, despite many study weaknesses, trends reported in this trial show that limiting visits in student-run clinics may not lead to success in patient referrals to more long-term primary care clinics.

**Starting a diabetes self-management program in a free clinic. (Soto 2007)**

**Program**

In 2003, the Open Door Health Center (ODHC) in Homestead, Florida received a grant from the Robert Wood Johnson Foundation to develop a Diabetes Management program for its uninsured patients. The center was tasked with overcoming the challenges of providing care with limited resources to patients in a free clinic. In order to do this, the program reviewed
diabetics’ charts and identified key factors in the clinic that had potential to change. Prior to this program, diabetic patients received an initial physical examination and monthly follow-ups with either a clinician or for medication pick-up. Patients had access to diagnostic tests, medications, and care provided by physicians, medical assistants, a pharmacist, a podiatrist, and health professional students.

The organization first decided to fund expansion of its staff by hiring a nutritionist and a part-time medical assistant/case manager. They then restructured their visits by having bimonthly appointments with either the physician, group appointments, or an appointment with the nutritionist. Patients continued to receive podiatry visits and ophthalmology referrals as well. Patient records were identified as diabetic and the clinic began using a template for diabetes-specific continuity of care notes used during these visits.

Group appointments/support groups were a key component of the ODHC’s program. This nontraditional approach allowed patients and their families to attend group visits run by students and practitioners where patients were provided a variety of services. The group visits began and ended with glucose monitoring, mild exercise, and medication distribution. However, the bulk of the visits used a Popular Education discussion approach for patients to share information and learn skills to manage their diabetes. Some group visits also included cooking classes or supermarket tours.

Peer educators were also a unique approach for diabetes management. ODHC trained five patients all from different cultures to serve as community health workers or peer educators. Peer educators served as support for their peers to provide diabetes education, acted as liaisons with the community, and worked as staff assistants. Peer educators were selected to mimic the
demographics of the community served, which is multiethnic and largely considered the “working poor.”

**Evaluation**

Reported outcomes measured by the program are clinical markers and patient attendance. The article also states case managers monitor initial and follow-up assessments of patient knowledge, perceptions, and support systems. However, these data are not published. The eight clinical markers reported for 67 patients over two years are standard measures for monitoring diabetes disease control. They include Hemoglobin A1c (HgbA1c), total cholesterol, triglycerides, low-density lipoprotein cholesterol (LDL), high-density lipoprotein cholesterol (HDL), systolic blood pressure (SBP), diastolic blood pressure (DBP), and body weight.

The study found statistically significant improvements before and after the program for total cholesterol, LDL, and body weight. The other markers all showed positive trends but were not statistically significant. The study also reported 1603 patients and 415 guests or family members attended the diabetes support groups over two years.

**Strengths/Weaknesses**

Because the clinic is open full-time, they are able to provide true continuity of care for patients with diabetes with no need to refer to another primary care clinic. However, there is no mention in this article of other community resources outside the ODHC clinic or if patients are assisted in accessing these resources. It is also unclear whether or not the program will be sustainable without the original grant funding or in a clinic only open one day per week.

The clinical markers used to evaluate the program do show promises of success in controlling diabetes but are still intermediate markers. Ideally, a longer-term randomized controlled study with a larger sample size could allow measurement of better end health
outcomes such as heart disease or mortality. However, this is not likely feasible in this setting because the population served is usually small and limited resources prohibit any large-scale clinical trials. Also, because many changes in the clinic were made at one point in time, it is unclear which changes had a positive effect and if all changes were necessary to receive a positive outcome. Overall, this comprehensive program appears to be effective in a free clinic open full time.

Adapting the chronic care model to treat chronic illness at a free medical clinic. (Stroebel 2005)

Program

The Salvation Army Free Clinic, an established free clinic in Rochester, Minnesota saw a need to move from a more acute illness model to having a systematic approach for treating patients with chronic diseases. In order to address this need, they used a chronic care model, providing comprehensive services for patients with either hypertension or diabetes. Volunteer physicians, nurses, diabetes educators, dietitians, and social workers ran the clinic, operating two nights per week.

The target population of the trial included 149 uninsured or underinsured patients with either hypertension or diabetes. Most patients visiting the clinic were uninsured although some had catastrophic care insurance that does not cover chronic disease management. Of the patients enrolled in the trial, 51 were also diagnosed with hyperlipidemia, another chronic disease. In total, 117 patients with hypertension and 91 with diabetes were included in the study. Of this population, the demographics include 71 Hispanic patients, 57 white patients, 11 African American patients, 76 females, and 73 males.
The program’s intervention strategy consisted of five different components: community intervention, an information system, delivery system design, decision support, and self-management support. First, community involvement remained strong throughout the intervention because the SAFC is a community based organization with both providers and patients coming from the outlying area. An information system was developed to identify patients with chronic diseases and was used to track their care.

A change in the delivery system was a key aspect of the program. Prior to the intervention, volunteer physicians and staff would see patients when the patient felt it was needed. This model leads to poor continuity because health providers change weekly and may not see the patient for more than one visit. To overcome this, the intervention had two staff nurses provide primary patient management using evidence-based medicine and algorithms. Physicians provided decision support by reviewing all medication changes by the nurses, providing telephone and email consultation, and holding clinic visits for acute issues or physician specific concerns.

Another key aspect of the intervention was encouragement of patient self-management. Patients were asked to establish self-management goals at each visit. Nurses followed-up with phone calls or during visits to monitor progress. Patients were also offered education provided by the American Diabetes Association and discussed with diabetes educators as well as other care providers.

Evaluation

For evaluation purposes, patients were assessed at enrollment and reassessed at a minimum of 100 days. Patients were then followed up to 22 months unless they were lost to follow-up. Disease-specific endpoints were used to evaluate the program. Success of the
program was defined by a one-stage reduction in blood pressure for hypertensive patients, a decrease by at least 1% of HgbA1c for diabetic patients, and a reduction of risk group in LDL cholesterol for patients with hyperlipidemia. If any of these three measures were met, the patient was considered to have reached a primary efficacy endpoint. Changes in mean arterial pressure, HgbA1c, and LDL cholesterol were also assessed.

The study found clinically significant improvement to be obtained for 79/149 patients (53%), based on an intention to treat analysis. This includes improvements in 64% of hypertensive patients, 53% of diabetic patients, and 58% of patients with hyperlipidemia. Of the 149 patients enrolled, 40 patients were lost to follow-up, mostly due to acquiring insurance or moving from the area. All changes in blood pressure, HgbA1c, and LDL were statistically significant and showed improvement in disease management.

**Strengths/Weaknesses**

Overall, this program had many strengths for a program implemented in a challenging environment. The program used a comprehensive approach to provide continuity of care with the resources available. The evaluation was performed fairly well with intent to treat analysis. However, the program did not have a control group for comparison. This leads to difficulties in assessing whether the success of the program would have been equal to no program. Because the program was implemented with multiple simultaneously occurring interventions, it is unclear which of the individual aspects of the intervention directly lead to success. The program also used intermediate clinical markers with no assessment of quality of life improvements. Despite these weaknesses of the study, the overall program appears to be successful in that it can provide continuity of care for a transient population with limited resources.
Conclusion

Overall, there are many trends seen in each of these programs outlined. These comparisons are outlined in Appendix A. Because of the nature of an uninsured population, challenges were similar among all of the programs. All populations were transient in nature, making programs often small in numbers and difficult to evaluate. Also, clinic resources, particularly time, were limited among all programs, making it difficult to implement large interventions. However, each program found unique ways to use their available resources to adapt and change to models that were more appropriate for chronic care.

Those that were particularly successful reached out to patients and the community to provide chronic care. They encouraged self-motivation, peer support, and frequent contact with medical personnel. They also found ways to provide continuity with providers despite a transient volunteer group. A couple of the programs that showed success in this particular area provided some form of care management to oversee patient involvement. Care management, coupled with an easy way to track patients through information databases, allows for more efficient and thorough care. Community involvement through care management also makes use of often untapped resources for patients. This model appears to be essential to continuity of care and overall better health outcomes for patients with chronic diseases.
Both hypertension and diabetes are identified as key topics in Healthy People 2020, each with multiple objectives for improving the health of people with these two diseases. In 2009, 28.2 percent of adults aged 18 years and older in the United States (US) and 30.5% of adult North Carolinians had high blood pressure/hypertension. Healthy People 2020 set a goal for reducing this number by 10% of the prevalence. For diabetes, 8 new cases per 1000 adults age 18-84 are diagnosed each year in the US. Each of these cases will need extensive health monitoring and education from providers. Healthy People 2020 set out many goals for improving many of the markers of diabetes control.

In order to help achieve all of the goals set out by Healthy People 2020, access to a primary care provider is necessary. In 2007, only 76.3 percents of the US population had a usual primary care provider. There were 23.7 primary care providers per 10,000 residents in Orange County in 2011, much greater than the North Carolina rate of 7.8/10,000. However, many of these providers do not see uninsured adults, leaving up to 18.9% of the Orange County population lacking access to affordable care. Although there are many state-wide programs in North Carolina targeting obesity and diabetes education, only more local programs provide services to increase access to primary care providers for chronic care.

Orange County’s largest providers for the uninsured population are Piedmont Health Services, a community health clinic located in Carrboro, NC, and the Orange County Health Department. Currently, 4% of the county population uses these clinics. There are many
barriers to using these services as defined by Healthy Carolinians. Most notably, many patients with limited English proficiency reported lack of available appointments at affordable health care centers such as these two.  

Another smaller scale organization providing care to the uninsured or underinsured is the University of North Carolina student-run clinic SHAC. Currently at the clinic, patients with chronic conditions such as diabetes and hypertension are eventually referred to primary care physicians for long-term care at local established clinics such as Piedmont Health Services. Approximately 40% of SHAC’s current visits include hypertension and diabetes care. However, due to few available appointments at these clinics, it takes approximately 2-6 months before patients can establish care with a primary care provider. During the interim, patients are not provided continuity of care from SHAC as the clinic only serves as more of an urgent or acute care clinic.

Because up to 12% of respondents to Orange County’s community health assessment reported difficulties in receiving care when needed in 2011, there is a definite need for more access to primary care to improve diabetes and hypertension morbidity and mortality. Orange County recognizes “Access to Health Care” as the number one health priority in Orange County and “chronic disease” as number four. Thus, I propose a comprehensive approach in planning a program to help alleviate some of this need by creating a new clinic called Bridge-to-Care to provide more continuity care to patients with the chronic diseases of diabetes and hypertension at SHAC.
Program Context

The Political Environment

Currently, 18.9% of Orange County’s population is uninsured. With full implementation of the Affordable Care Act (ACA), this number will hopefully decrease. However, because many states, including North Carolina, have chosen not to expand Medicaid eligibility, an estimated 4.8 million of the US population will remain in the “coverage gap,” not qualifying for Medicaid or Marketplace premium tax cuts. This population, coupled with undocumented immigrants, make up approximately more than 60% of the current uninsured population and will remain uninsured after implementation of the ACA.

Consistency with Local, State, and National Priorities

Because of the large number of patients who will remain uninsured under the ACA, free clinics such as the UNC student-run Student Health Action Coalition (SHAC) will be vital for ensuring access for this population, particularly in Orange County. In fact, Orange County’s 2011 Community Health Assessment listed “Access to Health Care” as its number one health priority in Orange County and “chronic disease” as number four. Not only would a chronic disease clinic at SHAC address both of these priorities, but it also aligns with more national and state goals for both chronic disease care and access to primary care providers as outlined in the US Healthy People 2020 and Health North Carolina 2020. Therefore, a Bridge-to-Care clinic focusing on improving both diabetes and hypertension care while helping patients access stable primary care directly addresses a great need in the Orange County community.
Acceptability to Providers and Recipients

One of the greatest challenges of adding an additional clinic to SHAC will be the approval of all parties involved in clinical care of patients. This includes student leaders and faculty advisors at SHAC, volunteers, and partnering organizations, including Piedmont Health Services. A chronic care program will need to merge as best as possible with the already established acute clinic at SHAC. It should also provide an additional service outside of SHAC’s current abilities. The program also relies on patients to be self-motivated for the clinic to function well. To ensure this, the diversity of the target population must be explored and culturally appropriate care is essential, particularly given the large Hispanic population at SHAC.

Possible Financial Resources

Currently, multiple grants and individual donors support the acute clinic at SHAC and its other programs. These include, but are not limited to, The Denver Foundation, North Carolina Association of Free Clinics, American Association Colleges of Pharmacy, University of North Carolina, and the American Pharmacists Association. SHAC has agreed to fund this project’s creation but long-term funding will need to be continuously assessed. Individuals from the community and businesses have been strong contributors in the past and will likely continue to be the main source of funding.

Technical Feasibility

Because of cost and access to technology, SHAC has limitations on the resources it can provide to patients. Many medications for diabetes and hypertension are available free of charge to patients but more advanced treatments may only be available for purchase by patients. The same is true for laboratory tests as well as other forms of imaging, etc. For these limitations, referrals will need to be made to the appropriate party as they are for the acute SHAC clinic.
Stakeholders and Other Factors

Another consideration is the importance of relationships with community partners for referrals. Currently, SHAC partners with Piedmont Health Services, Carolina Health Network, University of North Carolina Family Medicine, and other UNC specialty clinics for referrals. These partners will need to be informed of the project and the limitations it has, including only providing care for patients for a limited time period. It is essential that as space is available at these more established local clinics, SHAC patients will continue to be able to gain a primary care provider through these organizations.

Program Theory

Social science theories may be very beneficial in guiding program planning because they place the intervention in an overall context of what approach is best to reach the final goal. For the Bridge-to-Care clinic, the overarching goals are to improve patient access to care and in the process, improve patient health or potential for better health. In order to achieve these, both individual and community level theories must be considered.

Precaution Adoption Process Model (PAPM)

Because the Bridge-to-Care clinic will be providing care through patient-provider interactions, an individual-level model is appropriate. The PAPM model provides seven stages of behavior change, starting from lack of awareness and progressing to maintenance of a behavior. This model is ideal for this project because many patients at SHAC will be in the first two stages, (1) unaware of the issue and (2) unengaged by an issue, because they have had limited exposure to medical education or care. This is particularly true for diabetes and hypertension as these diseases are typically silent in nature and can lead to both lack of motivation and often patient non-compliance. As patients are seen in the clinic, each student
provider will need to assess at what stage the patient is and be prepared to help them to move
towards adopting positive health behaviors. Without patients’ commitment to their health, the
program will be ineffective.

**Community Organization**

Although considering individual intervention is essential, it is equally important to
recognize the program’s role in addressing the overarching community needs. The Community
Organization model is a systematic way of approaching this issue by focusing on identification
of problems, mobilization of resources, and developing strategies all for a common goal. With
key concepts like “relevance” to the community and “empowerment” and “participation” of the
population, the model allows the community to identify and solve its own matters. By
involving patients, leaders in the community, and other community members with interest in
improving health, this project has the greatest chance for success because the team can identify
potential roadblocks before they occur.

This model will be very applicable to the SHAC Bridge-to-Care clinic because it is
already in alignment with the community goals of improving access to care. It will allow leaders
in SHAC, the patient population, and other partnering organizations to identify common goals
and potential solutions to address both the patient needs and the needs of the SHAC organization.
It also goes further into defining SHAC’s role in the larger Orange County community and
identifying how the County’s health care needs may be addressed. Overall, by combing the
individual approach PAPM with the more population approach of Community Organization, it
will provide a more sustainable program in line with the needs of all parties involved.
Goals and Objectives

The overall goal of Bridge-to-Care is to improve the health of adult patients with chronic diseases in Orange County, North Carolina. To accomplish this goal, the clinic will target the underserved by providing continuity of care and educational services. The clinic will also encourage establishment of a primary care physician. The program will be designed to meet both short-term and long-term objectives outlined below. A logic model with these objectives can be seen in Appendix B.

Short-Term Objectives

1. **Objective:** By seven months, five medical student volunteers and five pharmacy student volunteers will have completed training for the clinic.
   
   **Activities:** Volunteers will be recruited via email and interviews and will commit for one year of service. Training will occur in the clinic by new volunteers shadowing during the pilot clinic. Each volunteer will attend at least one clinic night to be trained. Training will occur over one month.

2. **Objective:** By one year, 90% of patients seen in the SHAC Bridge-to-Care clinic will establish care at Piedmont Health Services (PHS) or another appropriate clinic in the community within six months after their initial visit at SHAC Bridge-to-Care clinic.
   
   **Activities:** Patients will be encouraged at every visit and by phone calls from the student overseeing the patient’s care, if necessary. Patients will be confirmed to have had a visit in a community clinic by verbal confirmation and chart review for PHS performed by the co-leaders of the clinic.

3. **Objective:** In 1.5 years, 50-60 patients will be enrolled in the Bridge-to-Care clinic at any point in time.
**Activities:** Patient recruitment will occur primarily by chart review. All stakeholders will be educated about the clinic and will be encouraged to refer new and established patients at SHAC to the Bridge-to-Care clinic. Patients will also be recruited from SHAC outreach health fairs.

4. **Objective:** In 1.5 years, there will be a statistically significant improvement in clinical markers for patients with diabetes or hypertension, measured according to the standard of care.

   **Activities:** Biomedical data collected will include Hemoglobin A1c, systolic and diastolic blood pressure, Low-density lipoprotein cholesterol (LDL), weight, body mass index (BMI), ophthalmology referral, microalbuminuria and the total number of these clinical makers obtained by the Bridge-to-Care clinic. Patient education will be provided through the Bridge-to-Care Group visits.

5. **Objective:** In 1.5 years, there will be statistically significant differences in patient reported quality of well-being before and after treatment by the Bridge-to-Care clinic.

   **Activities:** Patient well-being will be measured by the Quality of Well-Being Scale (QWB-SA) as validated and used by the University of California San Diego student-run clinic.  

**Long-Term Objectives**

1. **Objective:** By 3 years, the Bridge-to-Care clinic will have reduced the number of patients enrolled in the clinic that are lost to follow-up by 10%.

   **Activities:** The Bridge-to-Care clinic will keep a database of patients lost to follow-up, seen at SHAC acute care clinic, enrolled in Bridge-to-Care, and enrolled in a
primary care clinic. Student volunteers will maintain close contact with their patients and encourage attendance to visits and establishment of a primary care provider.

2. **Objective:** By 5 years, the percent of Orange County residents reporting difficulties in receiving care when in need will be reduced from 12% to 10%.  

   **Activities:** SHAC Bridge-to-Care will be publicized to the community via informational fliers and discussions provided at local primary care clinics. Patients will also be informed of any available community resources they may seek. Clinical measures will be monitored and assessed yearly.

3. **Objective:** By 5 years, student volunteers will receive educational credit for volunteering at Bridge-to-Care.

   **Activities:** UNC School of Medicine educational approval will be sought by developing a curriculum for student volunteers. It will be an elective credit for fourth year medical students and will provide a unique opportunity for continuity of care.

**Program Implementation**

**Activities:**

The Bridge-to-Care program will be implemented in a step-wise fashion to ensure the clinic maximizes both quality and efficiency. One of the major challenges of the clinic is its ability to merge smoothly with the already operating SHAC acute clinic on Wednesday nights. For both clinics to function most efficiently, logistics will need to be discussed and trialed.
Therefore, a demonstration project, or pilot clinic, is the best method of ensuring a smooth transition. Through this pilot, quality improvement methods such as Plan-Do-Study-Act cycles will be performed to maximize efficiency by reducing appointment times and increasing the number of patients that can be seen. Feedback from faculty advisors, clinic representatives, and patients will be vital to this pilot clinic and to Bridge-to-Care’s success. All of these goals and activities outlined are modeled in a timeline in Appendix C.

Following the pilot clinic, five upper-level medical students and five pharmacy students will be recruited and trained to work the clinic. They will be trained by (1) talking through a clinic appointment (2) shadowing the program leaders and (3) be observed by program leaders. Students will see patients in the clinic, acting as the primary physicians with oversight from attending UNC physicians who volunteer at SHAC. They will write prescriptions for medications, order labs, counsel and educate, and refer to specialty clinics when needed. In five years, these students will receive academic credit for a yearlong commitment to Bridge-to-Care clinic. Ultimately, the volunteers will act as advocates for their patients, encouraging establishment of a primary care physician through phone calls and patient visits to reach the goal of 90% of patients establishing outside care by one year.

Program leaders will continue to oversee clinic operations following the pilot clinic. Their tasks will include recruiting patients via phone calls and SHAC acute care referrals, recruiting and training volunteers, attending all clinics, collecting data and tracking patients, communicating with partnering organizations and stakeholders, and ultimately, developing a medical student curriculum. The final goals of these tasks are to have 50-60 patients enrolled in Bridge-to-Care clinic at any point in time while reducing the chronic disease burden of the patients seen in clinic and ultimately, the chronic disease burden in Orange County.
The program leaders will collect biomedical data as outlined previously according to the standard of care for the specific disease of interest. They will also collect data on the patient’s perceptions of their own health through quality of well-being measures. Program leaders will maintain a patient database of this information as well as the patient’s status of enrollment (enrolled, lost to follow-up, established primary care physician, etc.). The final goals of evaluation are to show statistically significant changes in biomedical and quality of well being data as well as reducing patients lost to follow-up by 10%.

Partnership with other key stakeholders will also be essential for success. This includes partnering with SHAC acute clinic leaders, pharmacy leaders, faculty advisors, and primary care clinics in the community. These partnerships will promote better patient care by first, recruiting patients into the Bridge-to-Care clinic to provide continuity of care, and later, establishing long-term chronic care management in a community primary care clinic.

**Budget:**

The budget set for Bridge-to-Care falls under the overarching SHAC organization. Expenses will include medications dispensed through the clinic, lab tests, immunizations other equipment, and supplies. All other typical clinic expenses, including overhead and incomes are not included because of in kind volunteers and building use. SHAC has agreed to cover all medications, labs, and clinic equipment used by Bridge-to-Care clinic. SHAC has already allocated $500 for the pilot program for purchase of Blood Pressure Cuffs for patient home use. SHAC has a number of grants and individual donors funding its current operations and currently has a grant of $3000 for medications, unknown budget for labs as these are covered in full by LabCorp, and unknown budget for other clinic equipment as these are covered in full by Piedmont Health Services. The pilot Bridge-to-Care clinic will assess the additional costs
incurred by the clinic with the addition of these chronic care patients. These averages will be used to set a budget for the next year and beyond. A tentative budget is provided in Appendix D.

**Sustainability:**

Bridge-to-Care clinic is promising in its ability to provide care and increase access for a number of patients in Orange County. At this time, I do not anticipate the time to accessing a primary care physician will shorten more than 1-2 months. Therefore, there will still be a need to provide care to patients during the interim time. The ongoing evaluation of clinic data will hopefully show an improvement in outcomes for these patients. SHAC acute clinic is already well established and supported by a number of grants and multiple donors. By increasing its scope of practice, I anticipate the program will continue to be sustained by grants and program leaders will seek out other grants specific for the Bridge-to-Care program.
EVALUATION PLAN

Rationale and Approach to Evaluation Outline

Evaluation Rationale

It is essential that the Bridge-to-Care clinic be initially and periodically evaluated to show success of the program and to make improvements. It is also critical to ensure ongoing funding of Bridge-to-Care for sustainability. Evaluation will be used to publish and disseminate results to other student-run free clinics so that if the program is successful, it can be implemented in other settings. The CDC recommends evaluation to establish the “what,” “how,” and “why it matters” for a program. This includes describing what the program’s effects are, how the program is implemented and if it is efficient, and why the program is important to public health.\(^{20}\)

Evaluator’s Role

For the evaluation of the Bridge-to-Care clinic, an internal evaluator is best suited to interpret whether the clinic has been successful through analysis of outcomes. An internal evaluator has unique insights into the program and can use the evaluation to make improvements that align with the program’s goals. They are also more likely to effectively make improvements because they will have buy-in from staff and other stakeholders. One concern with an internal evaluator is they are often too close to the program to recognize its shortcomings. To prevent this from influencing the evaluation, the evaluation should be highly participatory with all stakeholders involved in the assessment and should be focused on improvements.

To ensure an objective, productive evaluation, the evaluator should be chosen based on many qualities. Because stakeholders will be actively involved, the evaluator should be able to
listen, negotiate, and combine perspectives while respectfully working with the team, using conflict-resolution skills, if necessary.\textsuperscript{21} The evaluator should hold high ethical standards and be honest throughout the process, particularly in relaying the negative aspects of the program. They must also have knowledge of how to perform an evaluation and good communication to present results in a constructive manner.

\textbf{Stakeholders}

The primary stakeholders are the student leaders of Bridge-to-Care and the SHAC Coordinating Council. The council is particularly important because they will decide on funding for Bridge-to-Care. They should therefore have a vested interest in expressing what information they will need to determine continued funding for the program. Other stakeholders are the volunteers, coordinators, and faculty advisors from both the School of Pharmacy and the School of Medicine. Clinic operation, including availability of medications and lab services, is dependent on these volunteers’ time and support from their respective schools. Because these members are the front-line providers, their input in the evaluation is imperative for buy-in of improvement changes. Other stakeholders are community partners including Carolina Health Network, Piedmont Health Services, UNC Family Medicine, and other specialty clinics. These partners should hold a more peripheral role in the evaluation, only being involved in evaluation of the referral process.

\textbf{Potential Challenges}

There will likely be many challenges during the process of evaluation. First, the population the clinic serves may be difficult to follow for evaluation because of their transient nature. Because of this, it will be a challenge to obtain clinical markers and self-evaluation forms. It will also be difficult to evaluate clinical markers over a short period of time and with a
small sample size. In order to obtain the most complete data, communication must remain open with the community partners because patients may need to be followed as they are referred to primary care clinics. For clinic operation evaluation, data may be difficult to obtain because of the busy nature of the clinic. Therefore, all evaluation must be performed outside of clinic operations. Finally, because there are many parties involved in the program, there may be challenges with communication. It is therefore imperative that the evaluator facilitates open communication between stakeholders and promotes unity in the program operations.

**Plan Design and Methods**

**Plan Design**

Both implementation and outcome evaluations will be employed to ensure the program is successful in meeting its proposed goals. The implementation evaluation is based on the activities of the program, how they were performed, challenges faced, and potential improvements. The outcome evaluation ensures health outcomes of patients are being met and the program is creating change in patient care.\(^{22}\)

The best way to assess these key goals is through combining elements of a quasi-experimental study design with those of an observational study design. An observational study focuses on the implementation of the program and requires data collection on day-to-day operations. The quasi-experimental study focuses on outcome measures, particularly patient outcomes pre- and post-participation.\(^{23}\)

**Plan Methods**

In the evaluation, the evaluators will collect both qualitative and quantitative data. Qualitative data includes review of organizational records and open-ended interviews with both individuals and focus groups. Quantitative data includes medical record reviews for attendance
and clinical markers, pre- and post- quality of well being scores, and community health data review. A brief overview of the evaluation questions and method are provided in Tables 1-8.

To assess whether the volunteer base is trained to implement the program, organizational data will be reviewed specifically for the number of volunteers attending the training and if a designed curriculum was completed. The volunteers and potential volunteers will then be interviewed as individuals and as a group for feedback on any successes, challenges, and potential improvements to the training.

Quantitative methods will be used to evaluate the number of patients establishing care with a primary care provider, if 50-60 patients enrolled in the clinic at any point in time, and if there is a reduction in lost to follow-up rates. Program leaders and community partners will perform medical record reviews to count the number of patients enrolled in the Bridge-to-Care clinic, those established with a primary care team, and those lost to follow-up. Program leaders will also assess the number of times student volunteers were following up with patients outside of clinic. Patients and student volunteers will then be asked to provide individual feedback on difficulties in establishing care and what improvements could be made in the relationship with community partners. SHAC leaders, program leaders, and student volunteers will also participate in individual and focus-group interviews to assess challenges and improvements in the recruitment and retention processes.

Outcome measures will be assessed by medical record review of patient charts for clinical outcomes and a survey of patient reported quality of wellbeing. Limitations on reaching health outcomes or changes in reported quality of wellbeing will be assessed by conducting open-ended interviews with individual patients.
The Orange County Health Data will be used to assess long-term improvement in access to care in Orange County. This will include interviews with community partners and patients to determine any barriers to receiving care and any potential improvements.

Finally, a curriculum for student volunteers will be created and then evaluated mostly through review of quantitative data and the curriculum itself. This will include the number of students who complete the curriculum and if the curriculum has a clear design. Any potential improvement to the curriculum design will come from open-ended focus group interviews.

**Tables 1-8: Evaluation Tables**

1. Short-Term Objective: By seven months, five medical student volunteers and five pharmacy student volunteers will have completed training for the clinic.

<table>
<thead>
<tr>
<th>EVALUATION QUESTIONS</th>
<th>PARTICIPANT</th>
<th>EVALUATION METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 7 months, did five medical student volunteers and five pharmacy student volunteers complete training?</td>
<td>Program Leaders Student Volunteers</td>
<td>Organizational Records: Attendance Sheets</td>
</tr>
<tr>
<td>Did the program leaders design a training curriculum?</td>
<td>Program Leaders</td>
<td>Organizational Record</td>
</tr>
<tr>
<td>Was the program able to recruit enough volunteers for the year-long commitment? If not, why?</td>
<td>Student Volunteers</td>
<td>Organizational Record Open-Ended Interviews, Individual</td>
</tr>
<tr>
<td>Did the student volunteers feel confident to practice after one session?</td>
<td>Student Volunteers</td>
<td>Open-Ended Interviews, Individual</td>
</tr>
</tbody>
</table>
What went well with the training session?

Program Leaders
Student Volunteers
Open-Ended Interviews, Focus Group

What was challenging about the training session?

Program Leaders
Student Volunteers
Open-Ended Interviews, Focus Group

What improvements could be made to the recruitment process?

Program Leaders
Open-Ended Interviews, Focus Group

What improvements could be made to the training process?

Program Leaders
Student Volunteers
Open-Ended Interviews, Focus Group

2. Short-Term Objective: By one year, 90% of patients seen in the Bridge-to-Care clinic will establish care at Piedmont Health Services (PHS) or another appropriate clinic in the community within six months after their initial visit at the clinic.

<table>
<thead>
<tr>
<th>EVALUATION QUESTIONS</th>
<th>PARTICIPANT</th>
<th>EVALUATION METHOD</th>
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</thead>
<tbody>
<tr>
<td>After 1 year, did 90% of patients seen at Bridge-to-Care establish care with a primary care physician within 6mths of the initial visit?</td>
<td>Program Leaders Community Partners</td>
<td>Medical Record Review</td>
</tr>
<tr>
<td>Were any participants lost to follow-up or did participants refuse to establish a primary care provider?</td>
<td>Program Leaders Patients</td>
<td>Medical Record Review</td>
</tr>
<tr>
<td>What were the challenges in referring patients to a primary care physician?</td>
<td>Program Leaders Student Volunteers Patients</td>
<td>Open-Ended Interviews, Individual</td>
</tr>
<tr>
<td>What improvements could be made in partnering with community organizations?</td>
<td>Program Leaders Community Partners</td>
<td>Open-Ended Interviews, Individual</td>
</tr>
</tbody>
</table>
3. Short-Term Objective: In 1.5 years, 50-60 patients will be enrolled in the Bridge-to-Care clinic at any point in time.

<table>
<thead>
<tr>
<th>EVALUATION QUESTIONS</th>
<th>PARTICIPANT</th>
<th>EVALUATION METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 1.5 years, were 50-60 patients enrolled in Bridge-to-Care at any given point in time?</td>
<td>Program Leaders Patients</td>
<td>Medical Record Review</td>
</tr>
<tr>
<td>Were there any challenges in recruiting patients?</td>
<td>Program leaders Patients SHAC leaders</td>
<td>Open-Ended Interviews, Individual</td>
</tr>
<tr>
<td>What improvements could be made in recruiting patients?</td>
<td>Program Leaders Community Partners SHAC leaders</td>
<td>Open-Ended Interviews, Individual</td>
</tr>
</tbody>
</table>

4. Short-Term Objective: In 1.5 years, there will be a statistically significant improvement in clinical markers for patients with diabetes or hypertension, measured according to the standard of care.

<table>
<thead>
<tr>
<th>EVALUATION QUESTIONS</th>
<th>PARTICIPANT</th>
<th>EVALUATION METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 1.5 years, was there an improvement in clinical markers?</td>
<td>Program Leaders Patients</td>
<td>Medical Record Review</td>
</tr>
<tr>
<td>Were any participants lost to follow-up?</td>
<td>Program leaders Patients</td>
<td>Medical Record Review</td>
</tr>
<tr>
<td>What improvements could be made in improving these markers?</td>
<td>Program Leaders Patients</td>
<td>Open-Ended Interviews, Individual</td>
</tr>
</tbody>
</table>
5. Short-Term Objective: In 1.5 years, there will be statistically significant differences in patient reported quality of well-being before and after treatment by the Bridge-to-Care clinic.

<table>
<thead>
<tr>
<th>EVALUATION QUESTIONS</th>
<th>PARTICIPANT</th>
<th>EVALUATION METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 1.5 years, was there a statistically significant improvement in patient reported quality of well being?</td>
<td>Program Leaders Patients</td>
<td>Pre- and Post- QWB-Survey</td>
</tr>
<tr>
<td>What were the most important concerns for patients?</td>
<td>Program leaders Patients</td>
<td>Open-Ended Interviews, Individual</td>
</tr>
<tr>
<td>What changes do patients identify they would need to improve quality of well being?</td>
<td>Program Leaders Patients</td>
<td>Open-Ended Interviews, Individual</td>
</tr>
</tbody>
</table>

6. Long-Term Objective: By 3 years, the Bridge-to-Care clinic will have reduced the number of patients enrolled in the clinic that are lost to follow-up by 10%.

<table>
<thead>
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<th>EVALUATION QUESTIONS</th>
<th>PARTICIPANT</th>
<th>EVALUATION METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 3 years, was there a 10% decrease in number of patients lost to follow-up?</td>
<td>Program Leaders Patients</td>
<td>Medical Record Review</td>
</tr>
<tr>
<td>Were student volunteers trained to following up with patients via phone calls or mail?</td>
<td>Program Leaders Student Volunteers</td>
<td>Open-Ended Interviews, Individual</td>
</tr>
</tbody>
</table>
7. Long-Term Objective: By 5 years, the percent of Orange County residents reporting difficulties in receiving care when in need will be reduced from 12% to 10%.13

<table>
<thead>
<tr>
<th>EVALUATION QUESTIONS</th>
<th>PARTICIPANT</th>
<th>EVALUATION METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 5 years, was there improved access to care in Orange County (reported difficulties in receiving care reduced from 12 to 10%)?</td>
<td>Program Leaders Community Partners</td>
<td>Community Health Data</td>
</tr>
<tr>
<td>What were the barriers to receiving care?</td>
<td>Program Leaders Community Partners Patients</td>
<td>Open-Ended Interviews, Individual</td>
</tr>
<tr>
<td>What improvements could be made to improve access?</td>
<td>Program Leaders Community Partners</td>
<td>Open-Ended Interviews, Individual</td>
</tr>
</tbody>
</table>
8. Long-Term Objective: By 5 years, student volunteers will receive educational credit for volunteering at Bridge-to-Care.

<table>
<thead>
<tr>
<th>EVALUATION QUESTIONS</th>
<th>PARTICIPANT</th>
<th>EVALUATION METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 5 years, do student volunteers receive educational credit?</td>
<td>Program Leaders UNC School of Medicine</td>
<td>Organizational Record</td>
</tr>
<tr>
<td>Did program leaders partner with the School of Medicine?</td>
<td>Program leaders UNC School of Medicine</td>
<td>Organizational Record</td>
</tr>
<tr>
<td>Did the program directors develop a curriculum?</td>
<td>Program Leaders UNC School of Medicine</td>
<td>Organizational Record</td>
</tr>
<tr>
<td>Were enough students recruited to sustain the elective?</td>
<td>Program Leaders UNC School of Medicine</td>
<td>Organizational Record</td>
</tr>
<tr>
<td>What went well with the curriculum?</td>
<td>Student Volunteers Program Leaders UNC School of Medicine</td>
<td>Open-Ended Interviews, Focus Group</td>
</tr>
<tr>
<td>What was challenging about curriculum?</td>
<td>Student Volunteers Program Leaders UNC School of Medicine</td>
<td>Open-Ended Interviews, Focus Group</td>
</tr>
<tr>
<td>What improvements could be made to the curriculum?</td>
<td>Program Leaders UNC School of Medicine</td>
<td>Open-Ended Interviews, Focus Group</td>
</tr>
</tbody>
</table>

**Institutional Review Board Considerations**

To ensure ethical standards are upheld, SHAC Bridge-to-Care will need to seek approval by the University of North Carolina (UNC) Institutional Review Board (IRB) to perform any research and evaluation. The UNC IRB’s primary goal is “to protect the rights and welfare of the human subjects.” Because SHAC is a student-run organization at UNC, the university’s
IRB office is the best organization to oversee this task. All members of the evaluation team should be included on the IRB to ensure credit is given for authorship.

Typically, clinical operations with standard data collection recorded in a medical record are exempt from IRB approval. However, because the program evaluation will likely be published and presented, IRB approval is required. We will apply for an expedited review because there is only minimal risk to the patients. This risk only includes the risks of diagnosis and treatment consistent with the standard of care provided by physicians. Potential risks include blood draws, adverse medication side effects, medical mistakes, and breach of confidentiality. Also, there is minimal risk of psychological distress for patients completing the Quality of Wellbeing Survey. Patient data, including clinical markers, are also collected for clinic operations and internal quality improvement processes, both of which are non-research purposes.

Confidentiality of data will be maintained throughout collection and dissemination of the evaluation. Particularly sensitive data we will collect includes clinical markers and some patient demographics. Data will be maintained according to HIPAA standards, as is already occurring in SHAC’s established clinic. Data will be de-identified before the evaluation staff performs an analysis of the data.

All patients entering the Bridge-to-Care clinic will need to consent to the study. This will be performed both through written documentation and verbal confirmation at the first visit. The program leaders overseeing clinic operation will obtain consent. All consent forms will be available in both English and Spanish. A certified translator will also be used to obtain verbal consent, when necessary. Because many of the patients seen in the clinic have poor literacy, forms must be simplified and verbal consent must also be available.
One last consideration is the vulnerability of the population we are targeting. Patients will typically have a low income, be uninsured, and have one or more chronic illnesses. Because care will be provided free of charge, often with free medications, coercion may occur to participate in this study. However, this is the nature of the program and is unavoidable. Patients may still receive care in the acute SHAC clinic or in other local clinics, hospitals, etc for free or low cost. Overall, special care must be taken to ensure this vulnerable population is not harmed outside of the risk of receiving standard medical care and receive appropriate referrals to establish long-term care with primary care physicians.

**Dissemination Plan**

After an evaluation report is available, it is only useful if there is a means of disseminating it to the key stakeholders. These stakeholders should use the evaluation report to guide changes for improvement. The first step in ensuring the evaluation plan will be used is to involve the stakeholders in all stages of the evaluation process from the initial planning stages. This allows for each stakeholder to have a sense of ownership and responsibility with the evaluation plan. Each method of dissemination should be tailored toward the target audience. This should consider the timing, style, tone, message source, method, and format. Options for delivery include presentation, written reports, and individual meetings. All of these methods should include an opportunity for feedback from stakeholders.

Stakeholders of interest include all Bridge-to-Care volunteers, SHAC leadership, funding providers, and community partners, including UNC Family Medicine and Piedmont Health Services. During the evaluation process, bimonthly PowerPoint presentations will be given to all of those members directly involved in the program. SHAC leadership will also be updated at bimonthly meetings with the overarching council. Community partners and funding providers
will be provided a written report once per semester, including the budget. The Orange County Health Department will also be provided the evaluation report so they can plan other programs addressing access. Ultimately, if the program is successful, it will be published widely to allow for other student-run clinics to implement similar programs.

**DISCUSSION**

A clinic for chronic diseases in Orange County will address many of the community’s needs. First, it is our goal that this will improve access to care by serving as another outlet for patients with either diabetes and/or hypertension to receive care. Not only will patients have access to acute care, but also hopefully improve lifelong management of their chronic disease by eventually establishing a relationship with a primary care physician. By providing continuity of care with volunteer health care providers, the patient will likely benefit from shorter appointment times, better quality of care, and ultimately, better health outcomes. This clinic will also serve as a unique opportunity for students to form relationships with patients and manage their care over time.

From the systematic review, it is evident the most successful programs have a strong continuity between patients and providers and optimizes use of limited resources. In particular, community involvement ensures volunteers are available and the needs of the community are best met. These aspects must also be present throughout implementation of the Bridge-to-Care clinic.

One of the strengths of the Bridge-to-Care clinic is the shift in the type of care provided to patients. Chronic diseases such as diabetes and hypertension are becoming more widespread in the US population. Health care systems, including free clinics, must adapt to this need. Bridge-to-Care can play a small role in this shift by allowing for continuity of care of patients.
over time. The program is also designed to coordinate well within the existing SHAC structure. It should be easily incorporated as an addition to the services SHAC clinic currently provides.

Inevitably, the Bridge-to-Care clinic does have some potential weaknesses that may cause some difficulty in implementation of the program. First, the program is small in nature because of limited space and volunteer resources. Depending on the number of patients seeking care, some patients may still face interim time periods without health care. The evaluation plan allows the clinic to recognize any of these challenges and adapt accordingly. Another weakness of the program is its dependence on volunteers to provide care. Without a strong commitment from volunteers, the clinic will not be able to operate. Therefore, all volunteers must be screened for their potential commitment to the program before participation.

In the future, Bridge-to-Care should expand in both size and scope. After the initial pilot phase of the clinic, it will expand in the number of volunteers and patients involved. SHAC Bridge-to-Care should continuously be ready to adapt to the needs of the patients and address any changes in the amount of time it takes for patients to establish care with a primary care provider. In the future, patients with chronic diseases other than diabetes and hypertension should also be recruited for the clinic. These diseases include those typically managed in an outpatient setting such as thyroid disorders, mental health, etc. This ensures all patients in need of long-term care will have the option of free care through the clinic.

Overall, the Bridge-to-Care clinic is a unique program at the University of North Carolina, Chapel Hill. If successful, the program will have allowed for a great number of people in need to receive health care.
References


16. Buettgens M, Hall M. Who will be uninsured after health insurance reform?  


## Appendix A: Programs Overview

<table>
<thead>
<tr>
<th>Article (Authors)</th>
<th>Program Description</th>
<th>Setting</th>
<th>Population Characteristics</th>
<th>Evaluation</th>
<th>Outcome</th>
<th>Strengths and Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The UCSD student-run free clinic project: Transdisciplinary health professional education. (Beck 2005)</strong></td>
<td>Review article about a Student-Run Clinic in San Diego. Key goals of program: 1. provide healthcare for the underserved 2. medical teaching and training 3. raising awareness</td>
<td>Student-Run Clinic 3 sites in San Diego: 1 Urban 1 School 1 More suburban beach area</td>
<td>- “working poor” with no access to care at other facilities - 36.2% homeless - 52.7% Hispanic - large undocumented population - top diagnoses hypertension and diabetes</td>
<td>- Outcomes measured by Quality of Well Being scale (QWB-SA) - Clinical Endpoints: Blood pressure, HgbA1c - Student attitudes and career choices</td>
<td>- Free clinic students more likely in pre-post assessment to have acquired more positive attitudes to working with underserved and homeless - 767 patients seen in clinic for 2699 visits - No other outcomes published</td>
<td>++ Offers wide variety of services, including acupuncture, dental, interdisciplinary care, specialty care ++ Continuity of care is high, with established patients receiving priority over new patients -- Students typically only volunteer for one month at a time so patients may not have continuity of provider -- Many new patients are turned away</td>
</tr>
<tr>
<td><strong>Patient transition from a free clinic to a medical home. (Bowen et al. 2013)</strong></td>
<td>Einstein Community Health Outreach (ECHO) is an Student-run free clinic associated with Albert Einstein College of Medicine and the Institute for Family Health (IFH) Program designed to transfer patients from the student clinic to an IFH primary care site after 2 free clinic visits.</td>
<td>Federally Qualified Health Center Network in the Bronx, New York</td>
<td>Diabetic patients seen in clinic between July 2009 to June 2011</td>
<td>- Retrospective chart review of ECHO’s diabetic patients in the 2-visit program compared to control diabetes seen in clinic prior to program - visit gaps were measured as the time not seen in one of the clinics - visit gaps: &gt;90 days=”detrimental to continuity” &lt;91 days=”patient continuity” - linkage effectiveness = proportion of patients who had an appointment in primary care</td>
<td>- the program group did not have significantly different linkage effectiveness (p=0.3705) compared to controls - the program group had fewer patient visits (2.96 vs 4.44, p=.1181) and worse patient continuity (73% vs 93% p=0.081) compared to control - Overall, 2 visit limits may lead to less continuity and fewer patient visits</td>
<td>++ Both program group and control received referrals and visit reminders ++ program group and control reportedly similar -- No randomization -- Small sample size (n=50) -- No health outcomes were compared -- No follow-up with patients on whether they sought care elsewhere</td>
</tr>
<tr>
<td>Article (Authors)</td>
<td>Program Description</td>
<td>Setting</td>
<td>Population Characteristics</td>
<td>Evaluation</td>
<td>Outcome</td>
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<tr>
<td><strong>Starting a diabetes self-management program in a free clinic. (Soto 2007)</strong></td>
<td>Project goal was to develop and implement a system of care for people with type 2 diabetes.</td>
<td>Open Door Health Center, a free, full-time clinic in Homestead, Florida</td>
<td>- Multiethnic, working poor, uninsured - High rate of chronic illness</td>
<td>- 8 clinical markers used: - HgBA1c Total Cholesterol Triglycerides LDL, HDL Systolic Blood Pressure, Diastolic Blood pressure, Weight - Patient attendance</td>
<td>- Critical factors include reviewing and organizing records, efficient use of staff, education appropriate for population, patients become peer mentors, strong community partnerships - Significant improvement in total and LDL cholesterol, body weight. - HgBA1c, triglycerides, blood pressure, HDL cholesterol all more favorable but not significant - 1603 patients and 415 guests attended diabetes support groups in 2 years</td>
<td>++ Multifaceted approach for diabetes ++ Use of objective data for measuring success of the program -- Unclear if one technique led to improved outcomes or each technique in combination allowed for this improvement. -- Clinical markers are intermediate outcomes -- Small sample size</td>
</tr>
<tr>
<td><strong>Adapting the chronic care model to treat chronic illness at a free medical clinic. (Stroebel 2005)</strong></td>
<td>Project goal: change from an acute illness model to a planned care approach. Trialed for one year - RNs served as care managers and provide evidence-based clinical guidelines - Specialty consults by phone, email, or visits - Chronic disease registry - Culture and language-sensitive adaptations - Self-management goals</td>
<td>Salvation Army Free Clinic, operating 2 nights per week in Rochester, Minnesota</td>
<td>- 149 Uninsured or underinsured patients with hypertension or diabetes recruited - 117 with hypertension, 91 with diabetes, 51 with hyperlipidemia - 71 Hispanic, 57 white, 11 African American</td>
<td>- Disease specific endpoints: - one-stage reduction in blood pressure - decrease of at least 1% of HgbA1c - reduction in risk group in LDL cholesterol - change in mean arterial pressure, change in gBA1c and change in LDL</td>
<td>- 40/149 patients lost to followup - 79/109 patients had improvement in at least one chronic disease - 53% of enrolled patients showed improvement in endpoints - Changes in endpoints: - 12.7 drop in blood pressure, 1.24 drop in HgbA1c, 43.5 drop in LDL (all p&lt;0.001)</td>
<td>++ Intent to treat analysis ++ Good follow up of patients lost to follow up and patient tracking through the chronic disease registry -- Clinical markers are intermediate outcomes -- Small sample size -- No control group</td>
</tr>
</tbody>
</table>
## Appendix B: Logic Model

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Inputs</th>
<th>Activities</th>
<th>Outputs</th>
<th>Outcomes and Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Access to primary care for patients with chronic diseases improves health</td>
<td>- Stakeholders:</td>
<td>- Activities:</td>
<td>- Outputs:</td>
<td>- Outcomes and Impact:</td>
</tr>
<tr>
<td>- In 2011, 12% of residents of Orange County reported difficulty accessing care</td>
<td>- SHAC coordinators from each school</td>
<td>- Recruit and train medical and pharmacy volunteers</td>
<td>- Provide continuity for patients</td>
<td>Short term (0-3 years)</td>
</tr>
<tr>
<td>- There will be enough interest in the program to recruit enough patients and volunteers.</td>
<td>- Medical students, Pharmacy students, attending volunteers</td>
<td>- Partner with Bridge-to-Care Group Visits</td>
<td>- Patients and volunteers attend clinic</td>
<td>- Medical students and pharmacy students partner to provide appropriate care.</td>
</tr>
<tr>
<td>- Partnering community primary care clinics will continue to take referrals.</td>
<td>- Patients</td>
<td>- Develop a database of patients with diabetes and hypertension</td>
<td>- Provide student education</td>
<td>- Patients establish a primary care physician in the community.</td>
</tr>
<tr>
<td>- The time to establishment of a primary care provider will remain at a minimum of 2-6 months.</td>
<td>- Organizational:</td>
<td>- Patients called frequently by student doctor</td>
<td>- Improved data collection</td>
<td>- Number of patients enrolled is constant over time.</td>
</tr>
<tr>
<td></td>
<td>- SHAC acute clinic (triage, front/back, operations, lab, Get Covered Carolina, pharmacy)</td>
<td>- Recruit patients from chart review, referrals, outreach programs</td>
<td>- Patients are successfully referred to a community primary care clinic</td>
<td>- Improved disease control for patients represented by improvements in clinical markers.</td>
</tr>
<tr>
<td></td>
<td>- SHAC ophthalmology</td>
<td>- Educate key stakeholders on availability of clinic</td>
<td>- Improved communication with the community</td>
<td>- Improved patient reported quality of well-being, comparing before and after treatment in the clinic</td>
</tr>
<tr>
<td></td>
<td>- Bridge-to-Care Group Visits</td>
<td>- Promote clinic in community</td>
<td>- Curriculum developed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Partnering community clinics (UNC Family Medicine, Carolina Health Network)</td>
<td>- Develop a curriculum for medical students</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Infrastructure:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Piedmont Health Services</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>- Financial:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Grant funding from SHAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Materials:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Laboratory tests</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Paper/printing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Medications</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Long Term (3-5 years)

- Reduce number of patients lost to follow-up
- Increase access to care for residents of Orange County
- Provide education and educational credit for students volunteering at Bridge-to-Care
### Appendix C: Timeline of events:

<table>
<thead>
<tr>
<th>Start Date</th>
<th>Milestone</th>
<th>Completion Date (2014)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 29, 2014</td>
<td>Pilot clinic</td>
<td>May 28</td>
<td>Program leaders start pilot clinic, continuous PDSA cycles in clinic to improve efficiency.</td>
</tr>
<tr>
<td>Jan 27, 2014</td>
<td>Meet with Faculty Advisors</td>
<td>Jan 31</td>
<td>Program leaders update on current status, determine data collection for IRB</td>
</tr>
<tr>
<td>February 1, 2014</td>
<td>Institutional Review Board submittal</td>
<td>Submitted March 28</td>
<td>IRB includes data analysis for SHAC population and Bridge-to-Care population</td>
</tr>
<tr>
<td>March 1, 2014</td>
<td>Recruit two pharmacy students per clinic night for pilot</td>
<td>March 15</td>
<td>Non-continuity pharmacy students included</td>
</tr>
<tr>
<td>March 1, 2014</td>
<td>Develop budget for the clinic</td>
<td>March 15</td>
<td>Based on established SHAC clinic budget</td>
</tr>
<tr>
<td>March 15, 2014</td>
<td>Purchase Blood Pressure Cuffs</td>
<td>March 31</td>
<td>Pending inclusion in budget</td>
</tr>
<tr>
<td>March 24, 2014</td>
<td>Meet with Faculty Advisors</td>
<td>March 28</td>
<td>Update on current status and discuss challenges</td>
</tr>
<tr>
<td>March 24, 2014</td>
<td>Assess patient recruitment over past 2 months</td>
<td>March 28</td>
<td>Assess success to determine number of medical students to involve</td>
</tr>
<tr>
<td>March 28, 2014</td>
<td>Biomedical data collected, patient Quality of Well-Being score collected for patients</td>
<td>ongoing</td>
<td>Collected according to standard of care, QWB collected before and after treatment at Bridge-to-Care</td>
</tr>
<tr>
<td>April 1, 2014</td>
<td>Partner with Bridge-to-Care Group visits for pilot of this program</td>
<td>May 28</td>
<td>Patients recruited from clinic</td>
</tr>
<tr>
<td>Start Date</td>
<td>Milestone</td>
<td>Completion Date (2014)</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------------------------</td>
<td>------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>April 20, 2014</td>
<td>Meet with leaders from each health professional school</td>
<td>April 30</td>
<td>Determine numbers of volunteers needed for both the clinic and group visits</td>
</tr>
<tr>
<td>April 20, 2014</td>
<td>Develop application for Medical/Pharmacy Students</td>
<td>April 30</td>
<td></td>
</tr>
<tr>
<td>Sent April 30, 2014</td>
<td>Application for Medical and Pharmacy Students</td>
<td>Due May 14</td>
<td>Only upper-level pharmacy students will be recruited, if possible</td>
</tr>
<tr>
<td>May 14, 2014</td>
<td>Selection of five Medical and five Pharmacy Students</td>
<td>May 28</td>
<td>Selected by program leaders</td>
</tr>
<tr>
<td>May 26, 2014</td>
<td>Meet with Faculty Advisors</td>
<td>May 30</td>
<td>Update on current status and discuss challenges</td>
</tr>
<tr>
<td>June 1, 2014</td>
<td>Recruitment of patients for clinic</td>
<td>June 30</td>
<td>Performed by program leaders; goal of 50-60 patients enrolled at any point in time</td>
</tr>
<tr>
<td>June 4, 2014</td>
<td>Training of medical/pharmacy students</td>
<td>June 25</td>
<td>Performed by program leaders; students shadow in clinic</td>
</tr>
<tr>
<td>June 4, 2014</td>
<td>Schedules for medical/pharmacy students</td>
<td>June 25</td>
<td>Set by program leaders</td>
</tr>
<tr>
<td>July 2, 2014</td>
<td>Medical/Pharmacy students in clinic</td>
<td>ongoing</td>
<td>Reassess quarterly</td>
</tr>
<tr>
<td>August 20, 2014</td>
<td>Partnership with Bridge-to-Care Group visits</td>
<td>ongoing</td>
<td></td>
</tr>
<tr>
<td>January 1, 2015</td>
<td>Curriculum developed for student volunteers to receive educational credit</td>
<td>June 15, 2015</td>
<td>Partnering with faculty advisors to develop this curriculum</td>
</tr>
<tr>
<td>January 1, 2015</td>
<td>Apply for outside grant funding</td>
<td>June 15, 2015</td>
<td>Partner with acute SHAC to apply for grant funding</td>
</tr>
</tbody>
</table>
### Appendix D: Budget

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medications</td>
<td>cost pending*</td>
</tr>
<tr>
<td>Lab</td>
<td>In Kind, cost pending*</td>
</tr>
<tr>
<td>Immunizations</td>
<td>cost pending*</td>
</tr>
<tr>
<td>Clinic expenses: EKGs, pap smears, etc.</td>
<td>In Kind, cost pending*</td>
</tr>
<tr>
<td>Blood Pressure Cuffs</td>
<td>$50*8 cuffs=$400.00</td>
</tr>
<tr>
<td>Office Supplies</td>
<td>$10.00</td>
</tr>
<tr>
<td>Building Overhead</td>
<td>In Kind (PHS)</td>
</tr>
<tr>
<td>Personnel</td>
<td>In Kind (volunteers)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$500.00+</strong></td>
</tr>
</tbody>
</table>

*Average cost will be determined through pilot Bridge-to-Care clinic*