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Feasibility Study for an Off-Post, Primary Care Clinic
at Fort Campbell, Kentucky

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Abstract

Blanchfield Army Community Hospital is located on Fort Campbell, Kentucky. It is one of seven hospitals in the Southeast Regional Medical Command supporting soldiers living in the TRICARE North Region, which includes beneficiaries from 24 states. Over 90,679 beneficiaries currently live in the Fort Campbell catchment area and receive primary care at Blanchfield Army Community Hospital through the Red, White, Blue, Gold, and Young Eagle Clinics. The number of beneficiaries is rapidly increasing due to modularity changes and the deployment-related baby boom. In response to the increase in population, three options are being considered, by the command, to address the medical needs of the population. This paper is a feasibility study of one of the options, the development of an off-post, primary care clinic in Clarksville, Tennessee.

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Feasibility Study

Introduction

Blanchfield Army Community Hospital (BACH) is located on Fort Campbell, Kentucky, and provides support to over 90,679 military beneficiaries (Mary Arrington, Chief, Outcomes Management Division, Blanchfield Army Community Hospital, personal communication, February 24, 2005). The current facility was built in 1982 to replace an old World War II cantonment hospital. The majority of health care resources for Fort Campbell beneficiaries are located at BACH however; there are two on-post, primary care clinics for active duty soldiers. The LaPointe Health Clinic is a consolidated troop medical clinic consisting of six primary care clinics and one dental clinic. The Aviation Health Clinic supports soldiers assigned to Fort Campbell aviation units and is located near the airfield.

Fort Campbell is the home of the 101st Airborne Division (Air Assault), capable of deploying combat troops worldwide within 18 hours and providing long-term support of these troops in tactical environments (Kentucky Commission on Military Affairs, 2005). Fort Campbell is also a premier power-projection platform, i.e., soldiers, their supplies, and equipment are mobilized, deployed, redeployed, and demobilized from this Army installation (CHP 2 SEMI-FINAL BRAC REPORT, 2005). Soldiers from Fort Campbell are currently deployed and engaged in the Global War on Terrorism.

In addition to the division, there are six major tenant units on Fort Campbell including the 5th Special Forces Group (Airborne), 160th Special Operations Aviation Regiment, 716th Military Police Battalion, United States Army Medical Department Activity, Veterinary Command, and the United States Army Dental Activity (Fort Campbell Tenant Units, 2004). These and other units on Fort Campbell rely on BACH for health care services. The services most frequently utilized at Fort Campbell include primary care, obstetrics/gynecology, orthopedics, behavioral health, and maternal/infant services (BACH Business Plan, 2004).

The current eligible beneficiary population of 90,679 (Mary Arrington, Chief, Outcomes Management Division, Blanchfield Army Community Hospital, personal communication, February 24, 2005) continues to increase due to the changing force structure (Fort Campbell Modularity Input, 2004) and the deployment-related baby boom. The resulting increase in demand for health services at Fort Campbell directly impacts primary¹ and specialty care access, as well as delivery in both the in-patient and outpatient settings. Table 1 depicts the services currently available at BACH.

¹ The Institute of Medicine (JAMA, 1995) defines primary care as "the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community" (p. 192). The TRICARE beneficiary handbook says "[t]o the extent consistent with governing state rules and regulations, PCMs [Primary Care Managers] can include internal medicine physicians, family practitioners, pediatricians, general practitioners, obstetricians, gynecologists, physician assistants, nurse practitioners, or certified nurse midwives" (TRICARE Beneficiary Handbook, 2005, p. 40).

Table 1

Services Currently Available At BACH

Primary Care	
Internal Medicine	Pediatrics
Family Practice	
Other Services	
Allergy	Nutrition Therapy
Behavioral Health	Obstetrics
Cardiology	Occupational Therapy
Chiropractic Preventive Medicine	Ophthalmology
Community Health	Optometry
Dermatology	Oral Surgery
Educational & Developmental Intervention	Orthopedics
Environmental Health	Otolaryngology
Exceptional Family Member	Physical Therapy
Family Advocacy	Plastic Surgery
Gastroenterology	Podiatry
General Surgery	Preventive Medicine
Gynecology	Urology
Neurology	

Note: From Blanchfield Army Community Hospital Command Brief, 2005.

This graduate management project is a feasibility study of an off-post, primary care clinic as a viable alternative for meeting the increased demand for primary care services. The proposed off-post, primary care clinic is expected to attract family members residing off-post. These beneficiaries will no longer have to come onto Fort Campbell for primary care. By redirecting the new workload to an off-post, primary care clinic, BACH will have the capacity to care for all active duty beneficiaries on Fort Campbell. Additional benefits of this off-post, primary care clinic include more efficient distribution of ancillary workload, reduction in late arrivals for appointments, and elimination of an escalating parking problem. If selected as an alternative for further consideration, the model for this clinic would be heavily influenced by the structure of existing primary care clinics at BACH and at other parent organizations within the National Capitol Region that have separate primary care clinics.

Conditions That Prompted the Study

In fiscal year 2005, 9,000 additional beneficiaries are projected to arrive in the Fort Campbell catchment area² (Impact

² The TRICARE definition of a catchment area is a ". . . defined geographic area served by a hospital, clinic, or dental clinic and delineated on the basis of such factors as population distribution, natural geographic boundaries, and transportation accessibility. For the DoD Components, those geographic areas are determined by the Assistant Secretary of Defense (Health Affairs) and are defined by a set of 5-digit zip codes, usually within an

of Modularity Within the Southeast Regional Medical Command, 2004). Because on-post housing is very limited, these new arrivals will most assuredly reside off-post, either in Kentucky or Tennessee. Because additional beneficiaries cannot be supported within the current direct care structure, BACH's leadership is considering three alternatives to increase capacity. The first alternative is to send all additional workload to the private sector. The second alternative is to use excess space within BACH to build an additional clinic. The third alternative, and the one explored by this graduate management project, is to build an off-post, primary care clinic.

Two major reasons providing strong support for the development of an off-post, primary care clinic are the anticipated increase in demand for health care services and the requirement to meet TRICARE access standards. These require that primary care is available within 30 minutes and specialty care within 60 minutes of the enrollee's home (TRICARE Beneficiary Handbook, 2005).

Statement of the Problem

Throughout fiscal year 2005 Fort Campbell's active duty population will increase by 3,700 soldiers. The associated

approximate 40-mile radius of military inpatient treatment facilities" (Healthcare Glossary, 2005, p. 14).

active duty family member population will increase by 5,300. BACH must prepare to address the medical needs of the new population (Impact of Modularity Within the Southeast Regional Medical Command, 2004).

Literature Review

Economic theories, conceptual models regarding organizational change, examples of similar ventures, and a more thorough understanding of primary care support the development of an off-post, primary care clinic. These are now discussed in order.

Economic Theory

Economic theory provides support for an off-post, primary care clinic. Fort Campbell's health care facilities and personnel will not effectively or efficiently tolerate the anticipated increase in demand for health services. Supply and demand within the Military Health System (MHS) is skewed. Services are provided at no cost or at only a minimal cost. This is contrary to the perfect market, in which Adam Smith suggests that an invisible hand assists in achieving equilibrium (Henderson, 2002).

Henderson (2002) recognizes that health resources are limited and that the demand for health care may exceed the availability of services. In health-economic terms this concept is referred to as scarcity. Henderson (2002) states, "Resources

are scarce relative to unlimited human wants" (p. 57). From this statement, one can infer that increases in population will cause an increase in demand, a situation which has significant impact at Fort Campbell.

Military beneficiaries do not receive a significant incentive for remaining healthy or for low utilization of health resources. Because beneficiaries of the MHS do not have to absorb even a significant part of the cost of health care they may inadvertently utilize health resources more frequently. This phenomenon is referred to as "moral hazard" (Shi & Sing, 2001, p. 590) and results in an increased requirement for health services that must be predicted by the supplier, i.e., the MHS. Therefore, the organization must be creative in its approach to the provision of health care and services. It must find ways that are cost-effective, satisfying, and efficient to deliver services to eligible beneficiaries (Henderson, 2002).

The MHS is a niche market. Lawrence (2001) wrote about six essential requirements for the creation of a successful and profitable market niche. Even though the MHS is a non-profit organization, Lawrence's requirements apply. They are ensuring that the area of interest is or can be mastered, targeting and advertising to the population, becoming regarded as an expert, continually seeking knowledge, networking, and increasing effectiveness with strategic alliances (Lawrence, 2001, p. 23).

The concept of freestanding primary care clinics was discussed in a 1979 article in the *Journal of Ambulatory Care Management*. Although dated, the article clearly made points that are still relevant. The author, Marsha Gold, found literature to support the proposition that primary care delivered in freestanding clinics was less expensive than that delivered in hospital outpatient departments (1979). She (1979) discussed the effects of reimbursement, lack of control over costs, increasing amounts of technology, and the influence of case mix. All these issues remain concerns for health care providers and organizations today.

Gold (1979) also stated that there are mixed results when addressing economies of scale in medical practice; therefore, a larger practice does not necessarily result in lower costs. One might infer from this finding that expanding BACH to accommodate the increase in population might not be the best financial solution. However, Gold cautions against making decisions about hospital-based primary care solely on cost. She notes that other areas of concern include access, consumer preferences, provider needs, and quality of care (Gold, 1979).

Conceptual Models Regarding Organizational Change

A review of literature regarding organizational change identified conceptual models that support the development of an off-post, primary care clinic. Bazzoli, Dynans, Burns, and Yap

(2004) conducted a review of organizational change in health care. In their review, they highlight results from approximately 100 studies over the past 20 years. Their conceptual model of organizational change integrates multiple theories and builds upon existing research (Bazzoli et al., 2004). It incorporates Barnett and Carroll's content and process dimensions, Van De Ven and Poole's change process, and Armenakis and Bedeian's context and outcome of change theory (Bazzoli et al., 2004). While Barnett and Carroll alluded to context and outcome; these were not clearly defined in their initial model.

Bazzoli, Dynan, Burns, and Yap's (2004) resulting conceptual model has four main relational dimensions -- content of change, process of change, context, and outcome (Bazzoli et al., 2004). Content of change identifies the current state of the organization, ". . . the strategic orientation, organizational structure, and organizational-environmental fit" (Bazzoli et al., 2004, p. 252). The process of change identifies the actions taken during the actual change process. The third dimension, context of change, addresses the influences of the internal and external environments. Lastly, outcome of change is the criterion used in evaluating the success or failure of the change (Bazzoli et al., 2004).

Table 2 depicts the four dimensional, conceptual model of change. The model can be used to support the development of an

off-post, primary care clinic in Clarksville, Tennessee for Fort Campbell beneficiaries.

Table 2

The Four Dimensional Conceptual Model of Change

Concept	Theory
Content of Change	Current vs. desired state
Process of Change	How change occurs
Context	Internal & External influences
Outcome	Criteria used to evaluate success

Note: From "Two Decades of Organizational Change in Health Care: What Have We Learned," by Bazzoli et al., 2004, Medical Care Research and review, 61 (3), p.252.

Currently, BACH is able to provide services to eligible beneficiaries but anticipates an increase in demand. The desired state is that all beneficiaries receive timely and appropriate health care. For this to occur there needs to be a change.

Barnett and Carroll describe the process of change as the situation and requirements necessary for change to occur. Consideration must be given to how fast the change will occur, the activities required, internal adjustments, and obstacles, (Bazzoli et al., 2004).

The rate of the change at Fort Campbell is primarily affected by three factors. These factors are the restructuring of the Army and modularity requirements, funding availability, and organizational strategic planning needs. A key consideration is ensuring that neither BACH nor the Fort Campbell beneficiaries are negatively impacted by the proposed change.

The final component of Bazzoli, Dynan, Burns and Yap's (2004) model is the outcome. The concept of "outcome" describes the criteria used to evaluate success. The development of an off-post, primary care clinic will allow BACH to provide health care services to beneficiaries without impacting care to the active duty population. Success of the clinic might be measured by safety records, patient satisfaction, and financial impact. (Bazzoli et al., 2004).

Slater and Olson (2002) expand upon Michael Porter's Five Forces Model of Industry Competition (Ginter, Swayne & Duncan, 2002), which is a strategic approach for analyzing the external environment, and present a current perspective of industry and market analysis. They state, "... market analysis must consider the rate and unpredictability of change because these will influence profitability, strategy formulation, and strategy content" (Slater & Olson, 2002, p. 16). As part of the MHS, BACH must respond to significant demographic changes at Fort Campbell.

In 1995, Shortell, Gillies, and Devers wrote about impending changes to the health care system in America and termed its evaluation "reinventing the American hospital" (p. 131). They conceptualized a model focused on disease prevention and promotion of health and primary care, and they saw a shift to the outpatient setting (Shortell et al., 1995). Their list of recommendations for success included aligning the size of the delivery system with the community needs, and focusing the system on prevention, disease management, and health promotion (Shortell et al., 1995). Many of their predictions have come to pass. Since 1995, the business process for delivering health care has changed significantly. The idea of having a flexible system designed specifically to meet the needs of the patient population provides strong support for developing an off-post clinic for the beneficiaries of Fort Campbell.

Similar Ventures

While this paper is a focused discussion concerning one military treatment facility (MTF), the issue of expanding access to care also challenges other large health care networks such as that of the Department of Veterans Affairs. Borowsky, Nelson, Fortney, Hedeem, Bradley & Chapko (2002) discuss access issues there in a study regarding community-based outpatient clinics. The results of the study support community based outpatient clinics as a way to

improve access to primary care for veterans (Borowsky, et al., 2002). This study "... indicate[s] that in most dimensions of care . . . CBOCs [community based outpatient clinics] are performing at least as well as traditional VAMC [Veterans Administration Medical Center] clinics" (Borowsky et al., 2002, Discussion Section, Para. 3). Owning, operating, and staffing these primary care clinics is resource intensive but facilitates integration with the department's network (Borowski et al.). Other active military posts such as Fort Belvoir (Services Facilities, 2004) and Fort Hood (Darnall Army Community Hospital, 2005) have implemented off-post, primary care clinics.

The DeWitt Army Community Hospital at Fort Belvoir consists of a 46-bed hospital and four primary care clinics, two of which are community-based. These two clinics, located in Fairfax and Woodbridge, Virginia, assist their parent facility in providing primary care to 140,000 eligible beneficiaries located in Northern Virginia (Services Facilities, 2004) and can serve as a template for the design of the Fort Campbell off-post, primary care clinic.

Historically, the Department of Defense (DoD) has implemented programs resulting in the provision of health care benefits for beneficiaries at locations outside of the MTF. This began in 1956 with the Dependents Medical Care Act which "established a bylaw [sic] access to medical care" (Leahy &

Mouritsen, 1990, p. 17). The Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) followed in 1956 (Leahy & Mouritsen, 1990). The purpose of this program was to provide comprehensive health care benefits for active duty dependents and military retirees and their dependents until age 65 (Leahy & Mouritsen, 1990).

Before 1956, only active duty members were authorized treatment at DoD medical facilities. The hospital commander had the responsibility for determining whether active duty family members, and retirees and their family members could receive treatment (Leahy & Mouritsen, 1990). This fragmented methodology caused wide variation in eligibility and access (Military Compensation Background Papers, 2005).

Leahy & Mouritsen (1990) identified three major problems with the CHAMPUS program: costs greater than those anticipated, delays in payment resulting from the high number of claims, and an increased cost to beneficiaries. As an alternative to CHAMPUS, the Primary Medical Care for the Uniformed Services (PRIMUS) Program and Navy Care, called NAVCARE, were established in 1985. PRIMUS provided no-cost outpatient care for eligible beneficiaries (Leahy & Mouritsen, 1990). It had five goals: to "act as an extension of the DOD health care system; to improve access, convenience, and satisfaction for the beneficiary population; to reduce the over-utilization of military health

care facilities; to provide quality, cost-effective primary care; and to recapture CHAMPUS workload" (Leahy & Mouritsen, 1990, p. 18).

One problem with the PRIMUS program was that while it increased access, it did not reduce costs. Thus, the program did not receive support to expand as had been initially planned (Leahy & Mouritsen, 1990).

These programs changed over time and evolved, through Gateway to Care, (Dr. Karin Zucker, Professor, United States Army-Baylor Health Care Administration Program, personal communication, May 22, 2005) into the current DoD program for health care known as TRICARE and designed to improve cost, quality, and access to health services for military beneficiaries (Military Compensation Background Papers, 2005).

All these programs demonstrate DoD-wide efforts to improve the availability of health care for eligible beneficiaries of the armed services. The concept of developing an off-post, primary care clinic for beneficiaries at Fort Campbell is a smaller, local option for meeting the needs of an increasing population. The literature regarding CHAMPUS and PRIMUS programs reinforces the importance of having a solid business plan that demonstrates the benefits, financial and otherwise, for the parent facility and the beneficiaries and provides a realistic picture of the local health care market.

Primary Care Generally

In order to discuss an off-post, primary care clinic, it is essential to understand the components, or features, of primary care. The Department of Defense Population Health Improvement Plan and Guide (2001) lists "... seven desirable features of primary care" (p. 50). The first desirable feature is a therapeutic relationship. The second feature is continuity of care, which is described as "person-focused care over a period of time" (DoD TRICARE Management Activity, 2001, p. 51). The third feature is comprehensiveness (DoD TRICARE Management Activity, 2001). The fourth is the coordination of services. The fifth feature describes individual and family-centered strategies for delivering care in a variety of environments and is tied to the sixth, which addresses community-orientation and involvement through the identification of "unique opportunities, challenges, and resources" (DoD TRICARE Management Activity, 2001, p. 51) that affect the Army, BACH, and the local community (DoD TRICARE Management Activity, 2001). The seventh feature is accountability by both the providers and the beneficiaries (DoD TRICARE Management Activity, 2001).

These seven desirable features require consideration before the development of an off-post, primary care clinic for Fort Campbell beneficiaries can move forward. For example, continuity of care is a concern for military beneficiaries

because providers frequently deploy. Interacting with the same provider over time allows for a healthy provider-patient relationship which serves as a foundation for the other desirable features.

Research Methods and Procedures

Hypothesis

The hypothesis was that an off-post, primary care clinic is a cost-effective and favorable alternative for satisfying increasing demand for health services. The null hypothesis was that an off-post, primary care clinic is not a cost-effective or favorable alternative for satisfying the increased demand for health services.

Validity

This study employed a predictive perspective of criterion-related validity because it relied on beneficiaries maintaining historical usage patterns. Concurrent criterion-related validity was difficult to demonstrate because the off-post, primary care clinic does not yet exist. As such, usage and satisfaction data are unavailable.

Construct validity addresses both the theory and measurement tool employed (Cooper & Schindler, 2003). This study was influenced by characteristics without empirical validation. Beneficiary usage could not be determined exactly because there are many factors, not just location, that influence choice.

Ethical Considerations

Ethical risks regarding this research were minimized by looking at data without protected health information. Protected health information was omitted from data queries by the system operator. Analysis of the eligible population was conducted using zip codes to control for potential bias. Human subjects were not involved in any portion of this research.

Health Insurance Portability and Accountability Act

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) has a tremendous impact on health care in the United States. Title 1 of HIPAA "... protects health insurance coverage for workers and their families when they change or lose their jobs" (Centers for Medicare & Medicaid Services, 2005, HIPAA Health Insurance Reform, Para. 1). Title II of HIPAA covers administrative simplification requirements. This requires "... the Department of Health and Human Services to establish national standards for electronic health care transactions and national identifiers for providers, health plans, and employers. It also addresses the security and privacy of health data" (Centers for Medicare & Medicaid Services, 2005, HIPAA Administrative Simplification, Para. 1).

The intent of administrative simplification is to increase the efficiency and effectiveness of health systems by standardizing the transmission of health information (Centers

for Medicare & Medicaid Services, 2005). As noted above in the ethical discussion, all protected health information was removed by the Management Analysis and Reporting Tool (M2) operator, and all HIPAA provisions were adhered to during the research process.

Assumptions and Limitations of this Project

This study relies on the assumption that the eligible beneficiary population will embrace the idea of an off-post, primary care clinic. Some members of the target population may not want to leave the hospital to receive health care and may not select this option.

All data were drawn from the M2 data repository. The M2 is a corporate database managed by the (MHS). This data source is assumed to be valid and reliable. This is a reasonable assumption because the data repository is professionally maintained and monitored; the data are derived, in their raw form, from MHS hospitals. Those hospitals, in turn, pull their data, once processed, from M2 to make decisions. These hospitals communicate any data inconsistencies through a formal feedback process. This process is, in effect, built-in quality control. Agencies and organizations within the Department of Defense rely on the M2 to provide accurate data for research studies, operational decisions, and testimony before Congress.

The validity of beneficiary information utilized for this study was affected by several factors. The resident data are continuously monitored to ensure content validity; and new additions are closely scrutinized to maintain database integrity. The M2 utilizes enrollment information from the Defense Enrollment Eligibility Reporting System (DEERS). The validity of data contained in the DEERS relies on beneficiaries to update the database. Personnel may not initiate changes until they seek care, which may affect the quality of data available. Data may also be incorrect due to input-errors. These errors occur regarding patient registration information and coding. This study further assumes the population will remain at Fort Campbell and that utilization of primary care services will follow historical trends.

A limitation of the current study is the lack of a detailed market survey. Market analysis conducted within this graduate management project is, however, of sufficient detail to achieve the project's goals. A more detailed market survey is an area for follow-on evaluation of all alternatives currently being considered by the command.

Target Population

The target population was defined as eligible beneficiaries currently living off-post and using BACH. The M2 System served

as the data source because it maintained information regarding beneficiaries within the geographic catchment area.

Case Study Design

This is a descriptive, feasibility study with an emphasis on quantitative data regarding Fort Campbell beneficiaries. Active duty soldiers were not included in this data set because they will be treated on-post³.

Data analysis was conducted in three phases. In the first phase the composition of the catchment area population was analyzed. The population was grouped by age, gender, and beneficiary category. The population was further detailed by zip codes to identify high concentrations of beneficiaries. These clusters of patients defined the target population. Ultimately, proximity to the target population will probably be a major determinant of the location of a clinic, if one is built. Phase two of the analysis identified the services most frequently required by the target population. These data informed scope-of-service decisions, which are discussed later.

The third phase involved developing a staffing model, calculating facility costs, and comparing relative value unit (RVU) cost at the proposed off-post, primary care clinic to BACH. The results from phase three demonstrated that the off-

³ Under routine conditions, active duty soldiers are required to seek care at MTFs (AR 40-100, p. 66, para. 10-6).

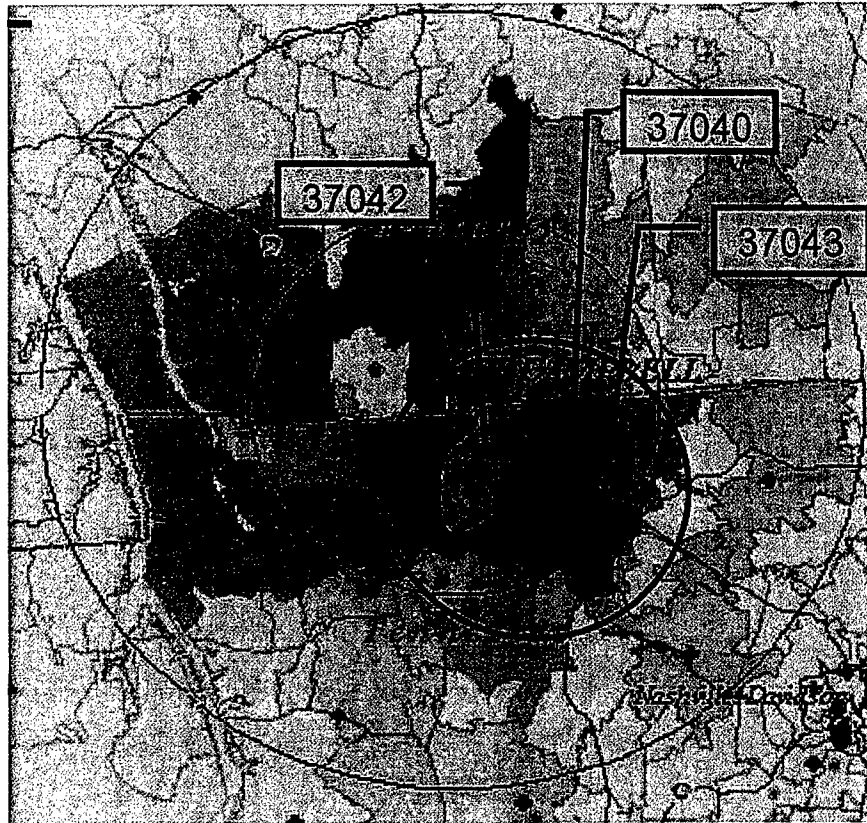
post, primary care clinic could satisfy the demand for a reasonable price.

Results

Results by Phase

Phase one involved the collection of data for every patient visit by a non-active duty beneficiary who lived off-post but not more than 40 miles from BACH. Data were grouped by zip code to determine those locations where residents relied most heavily on BACH for primary care. Zip codes 37040, 37042, and 37043 had the highest concentrations of beneficiaries. Figure 1 depicts the catchment area and shows the areas represented by those zip codes.

Figure 1. Catchment Area and Target Zip Codes



The beneficiaries from these three zip codes (37040, 37042, and 37043) were selected as the target population. Further research was done to determine age, gender, and beneficiary category (e.g., active duty family member, retirees, and retirees' family members). This population was found to include many young female beneficiaries of childbearing age; therefore, pediatric care should be a service incorporated in the off-post clinic.

In phase two, the target population was further researched by the amount of care demanded, by specialty, in fiscal year 2004. This very detailed review provided a clear understanding

of beneficiary demographics and care preferences. Table 3 shows a breakout of care delivered, in RVUs,⁴ in fiscal year 2004 to beneficiaries in the three targeted zip codes. All workload is reported in RVUs.

When RVUs were introduced they represented three components of physician-expense identified as physician work, practice expense, and professional liability (malpractice expense). The M2 system, in calculating RVUs, relies only on the physician work component. The practice expense is counted in the Ambulatory Patient Group weight, and malpractice is not an element of the calculation (Working Information Systems to Determine Optimal Management, 2003, p. 7).

Table 3

Workload in Three Target Zip Codes by RVUs

Zip Code	RVUs
37040	24,934.69
37042	127,098.71
37043	18,367.73
Total	170,401.13

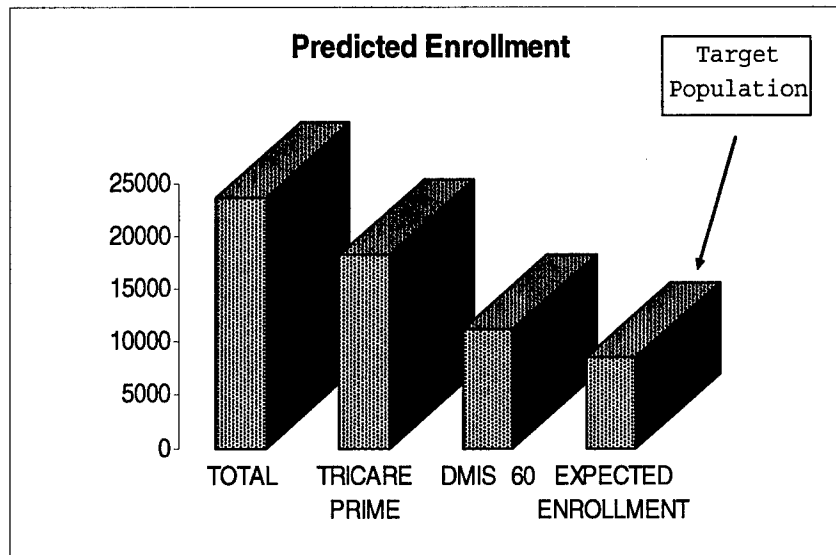
⁴ In 1992, Medicare introduced the RVU as part of the Resourced Based Relative Value System (RBRVS) in order to standardize physician payments (Working Information Systems to Determine Optimal Management, 2003).

The total number of RVUs for the three zip codes is 170,401.13. This prediction exceeds the workload at West Point, Fort Wainwright, Fort Rucker, and Fort Irwin; it approaches the actual workload at Fort Riley (LTC Gregory LaFrancois, Deputy Commander for Administration, Blanchfield Army Community Hospital, personal communication May 16, 2005). Therefore, the predicted workload clearly indicates sufficient demand for a stand-alone clinic.

The next stage in the research process was to determine the enrollment. A subset of the 23,765 Blanchfield-reliant beneficiaries living off-post in the three target zip codes is expected to enroll to the off-post, primary care clinic.

This subset was developed using a three-step process. In step one, only the TRICARE Prime enrollees in the three target zip codes were identified; this reduced the potential target population to 18,340 beneficiaries. In step two, the data set was further refined to include only those beneficiaries with a Defense Medical Identification System identification (DMIS ID) code of 60, which indicates that the patient is enrolled to BACH, as opposed to one of the other two health clinics on Fort Campbell. At this point, the potential number of enrollees was 11,265.

Figure 2. Predicted Enrollment



Step three involved considering the potential number of enrollees and predicting how many beneficiaries would choose to receive their care at an off-post, primary care clinic, if it were an option. Historically, 76% of eligible beneficiaries in the Fort Campbell catchment area enroll with the MTF (Mary Arrington, Chief, Outcomes Management Division, Blanchfield Army Community Hospital, personal communication, November 9, 2004). By applying this expected participation rate, it was estimated that 8,561 beneficiaries would utilize an off-post, primary care clinic. The population breakout is shown in Table 4.

Table 4

Predicted Population for Off-Post, Primary Care Clinic

Age Groups in Years	Female	Male
0-4	313	338
5-14	824	822
15-17	300	297
18-24	771	283
25-34	1059	181
35-44	1478	471
45-64	556	293
65+	292	283
TOTAL	5593	2968

Phase three evaluated the clinic's ability to satisfy demand for a reasonable cost. This phase was broken into three steps. In the first step, a staffing model was developed and the costs associated with staffing the off-post, primary care clinic were determined. In step two, the facility costs for the off-post, primary care clinic including rent, utilities, housekeeping, and maintenance were calculated. The third step compared the cost per RVU at the off-post, primary clinic to the cost at BACH.

Service Mix

As reflected in Table 5, the population demands primary care services above all else (42%). Consequently, the off-post, primary care clinic, as proposed, would not deliver specialty care; that care would continue to be delivered through BACH.

Table 5

Fiscal Year 2004 Service Mix

Service	Total RVU	%	Service	Total RVU	%
Primary Care	41,942	42	Cast Clinic	1,591	2
Ob/Gyn	14,845	15	Urology	1,375	1
Pediatrics	10,522	11	Occupational Therapy	1,339	1
Orthopedics	6,223	6	Cardiology	975	1
Allergy	6,086	6	Nutrition	908	1
Physical Therapy	3,833	4	Podiatry	627	1
Ear, Nose, Throat	2,164	2	Audiology	612	1
Ophthalmology	1,972	2	Gastroenterology	294	< 1%
General Surgery	1,929	2	Other	718	< 1%
Dermatology	1,844	2	Grand Total	99,799	100

The high utilization of primary care supports family practice services at the proposed clinic. However, high usage of obstetrical and gynecological services are also predicted. These services must either be provided at the clinic or through a

sharing agreement between the off-post, primary care clinic and BACH. Based on analysis of the population from the three target zip codes, female beneficiaries had the highest consumption of RVUs. This is shown in Figure 3.

Figure 3. Workload in RVUs by Zip Code

	0-4 YEARS	5-14 YEARS	15-17 YEARS	18-24 YEARS	25-34 YEARS	35-44 YEARS	45-64 YEARS	65+ YEARS	Total
37040									
Female	1,036.14	1,368.48	428.77	2,652.97	3,722.80	2,991.32	2,799.87	384.36	15,384.71
Male	1,122.68	1,495.41	392.00	738.71	1,723.83	1,975.63	1,805.73	295.99	9,549.98
37042									
Female	6,344.21	6,233.75	2,081.52	17,010.68	20,828.12	12,483.58	11,668.89	1,450.07	78,100.82
Male	7,502.68	8,010.28	1,892.69	6,718.86	9,773.95	6,561.51	7,390.80	1,147.12	48,997.89
37043									
Female	597.79	1,049.99	364.11	1,516.61	2,162.82	2,029.58	3,045.67	329.54	11,096.11
Male	686.37	794.90	374.23	753.62	1,041.15	1,027.79	2,046.07	547.49	7,271.62
Total	17,289.87	18,952.81	5,533.32	29,391.45	39,252.67	27,069.41	28,757.03	4,154.57	170,401.13

Figure 3 shows the workload broken out by zip codes and age groups. Females comprise 61% of this population, and this will influence the service mix.

As discussed previously, the location of the off-post, primary care clinic will be influenced by the area with the largest clusters of patients. Zip code 37042 is the most significant source of workload and should be considered as the site for the clinic.

Figure 4 is a comparison of the average enrollment at the BACH Blue Clinic and the potential enrollees to the off-post, primary care clinic. The target population most closely matched the Blue Clinic based on age, gender, and size.

Figure 4. Comparison of Female Population

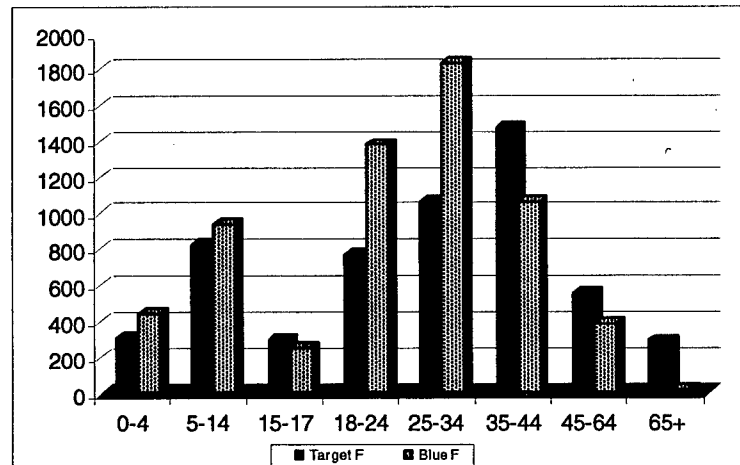


Figure four compares the predicted off-post female population to female beneficiaries enrolled to the BACH Blue Clinic. Although the predicted off-post population has fewer females in the 18-24 and 25-34 age groups, it is important to remember that these beneficiaries are of childbearing age. At BACH, once the beneficiary becomes pregnant, care is no longer delivered at the assigned primary care clinic but through the Obstetrics and Gynecology Clinic. Given that there are high numbers of female beneficiaries in the predicted off-post population it is important to strongly consider offering obstetrical and gynecological services at the off-post, primary care clinic. The number of female beneficiaries of child-bearing

age also supports the inclusion of pediatric services at the clinic.

Figure 5. Comparison of Male Population

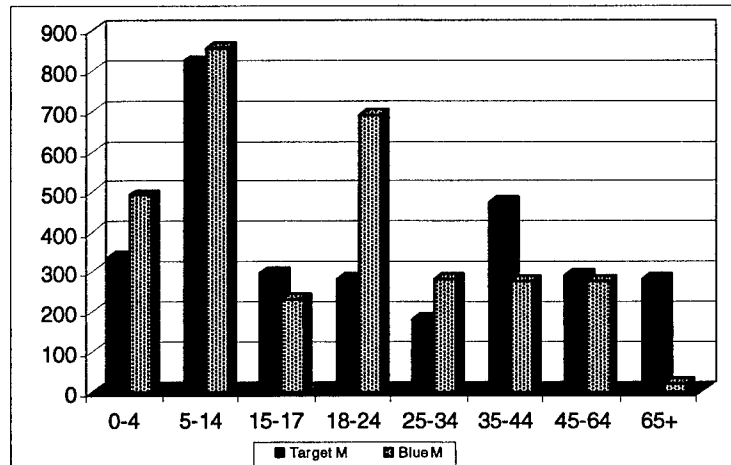


Figure five compares the predicted male off-post population to the enrolled male population at the BACH Blue Clinic. The predicted off-post target male population is very similar to the Blue Clinic in the 0-4 and 5-14 year age groups. This provides support for having pediatric services at the off-post, primary care clinic. The Blue Clinic has more enrollees in the 18-24 age group. This increase can be attributed to the active duty members assigned and enrolled to BACH. As previously stated, the off-post, primary care clinic would not include active duty members. In the 25-34 and 35-44 age groups, the total numbers of beneficiaries are slightly different but, if added together, the groups would have similar totals. Because these are males eligible for the workforce they may have similar health care requirements.

The TRICARE Plus program for BACH beneficiaries over 65 years of age is limited to 800 enrollees. This program is currently not accepting new enrollees because it is at maximum capacity (Mary Stockdale, Health Systems Specialist, Managed Care Division, Blanchfield Army Community Hospital, personal communication May 16, 2005). Consequently, beneficiaries over 65 years of age will not be enrolled at the off-post, primary care clinic. Because beneficiaries over 65 years will not be included in the enrollment, it will increase availability for beneficiaries in the other age groups.

Staffing

The distribution of personnel across the primary care spectrum will be influenced by the off-post population. Consideration should be given to services most frequently demanded by the population. These services include family practice, pediatrics, and obstetrics and gynecology. The BACH Blue Clinic can serve as a model for support personnel because of the similarity to the proposed off-post, primary care clinic.

The number of providers drives the clinic size. Current guidance states, "The number and mix of primary care providers must satisfy demand and ensure access to all necessary services. Ratios will vary among Regions⁵ based on enrollee demographics,

⁵ Beginning in 2004, the 12 TRICARE regions were reorganized into 3 regions; this was done to improve service for the beneficiaries (TRICARE Fact Sheets, 2005).

epidemiologic data and personnel resources. Adjustments should be made as appropriate" (DoD TRICARE Management Activity, 2001, p. 52). Fort Campbell is in the TRICARE North Region⁶. Table 6 depicts variables influencing provider to enrollee ratios, i.e., panel size, and highlights those most representative of the Fort Campbell health care market.

⁶"The DoD has partnered with Health Net Federal Services, Inc. (Health Net) to assist in operating the TRICARE program for more than 2.78 million beneficiaries in the TRICARE North Region. The North Region includes Connecticut, Delaware, the District of Columbia, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, Wisconsin, and portions of Tennessee (Ft. Campbell area), Iowa (Rock Island Arsenal area), and Missouri (St. Louis area)" (TRICARE Beneficiary Handbook, 2005, p. 2).

Table 6

Factors Affecting Primary Care Panel Size

Factors Affecting Primary Care Panel Size	Priority Factor for Planning
1. Administrative Duties	X
2. Enrollee Demographics	X
3. Enrollee Needs and Preferences	
4. Epidemiologic Data	
5. Medical Readiness	
6. Military-Unique Demands	X
7. Patient Case-Mix	X
8. Personnel Resources	
9. Predicted Personnel Needs	
10. Productivity Ratios	
11. Professional Competence	
12. Professional Practice Acts	
13. State Law	
14. Standards of Care	X
15. Support Staff Capabilities	
16. Team Composition	

Note: From Department of Defense Population Health Improvement Plan and Guide, DoD TRICARE Management Activity, 2001.

In the Department of Veterans Affairs system, the standard for primary care panel size is heavily influenced by an increased focus on improving quality, satisfaction, and efficiency (Mayo-Smith, & Dooley, 2004). These are shared goals among the military, Department of Veterans Affairs, and civilian communities. Consequently, it is essential to use a model that

addresses the factors influencing providers' availability to care for patients.

At BACH, the Automated Staffing Assessment Model (ASAM) is the standard that determines the number of patients enrolled to each provider. The ASAM model is population-based, meaning that the model considers the needs of the population when determining the number of providers.

In a 2000 *Family Practice Management* article entitled "How Many Staff Members Do You Need", author Crystal Reeves stated, "The most effective way to determine our staffing needs is to consult industry benchmarks, allowing adjustments for unique circumstances within your practice" (2004, p. 1). Two such models were used in this research.

In order to determine the number of providers required for the proposed off-post, primary care clinic, both the ASAM model and the BACH model were used. First, the ASAM model was compared to the actual enrollment model used at BACH, hereafter called the BACH model. The BACH model reflects actual staffing and is supported by TRICARE requirements that state "[t]he PCM [primary care manager] requirement is a ratio of one PCM to every 1,500 enrollees" (DoD TRICARE Management Activity, 2001, p. 53).

Table 7

ASAM and BACH Model Provider per Population Ratio

Service	ASAM Factor	BACH Model	Providers using ASAM	Providers using BACH
Family Practice	1:1,178	1:1,500	7.27	5.71
Pediatrics	1:1,178	1:1,500	7.27	5.71
Internal Medicine	1:1,178	1:1,200	7.27	7.13
Obstetrics	1:1,178	1:1,178	7.27	7.27

Obstetrics is considered primary care in some organizations, and specialty care in others. The definition of primary care manager is dependent upon state rules and regulations (TRICARE Beneficiary Handbook, 2005).

The ASAM standard for primary care is one provider per 1,178 enrollees (ASAM III, 2005). In the proposed model the assumption was made that obstetric care panel size would be similar to primary care. Although the number of beneficiaries per obstetric providers at BACH is based on the workload, not the population, an obstetric provider at BACH serves a panel of approximately 1,178 beneficiaries (Elizabeth Saez, Manpower Analyst, Blanchfield Army Community Hospital, personal communication, March 30, 2005). This number, consonant with ASAM and the BACH model, was accepted.

The fourth column in Table 7 depicts the number of providers required to care for the anticipated target population of 8,561 when the ASAM factor is used. The fifth column depicts the number when the BACH model is used, i.e., the ratio of providers to patients currently enrolled at BACH.

The BACH model results were utilized for predicting the requirements for the off-post, primary care clinic. This model is successful at BACH for the delivery of primary care, and, therefore, can be assumed to be appropriate for the off-post, primary care clinic. Use of the BACH factor would require 25.8 providers for the off-post, primary care clinic. That number can be further divided to show the recommended number of physicians, nurse practitioners, physician assistants, and nurse midwives. The breakout of personnel is shown in Table 8.

In order to develop a model and reduce error in the population estimates, recent workload experience was reviewed to gain perspective of the number of RVUs these beneficiaries would demand. Table 4 indicates that the target population would demand 14,845 RVUs for obstetrical/gynecological care. Dividing 14,845 by the number of RVUs a provider generally produces in a day (14,845 total RVUs demanded/15.4⁷) results in 964. From this, 964/260 (work days in one year) resulted in 4.28 providers

⁷ The 15.4 RVUs per provider i.e., full time equivalent, per day is the Army goal according to the 2004 Defense Health Program Performance Plan (Educating Your Stakeholders, 2004).

required for obstetrical/gynecological care. The same calculation for pediatrics, with a total RVU demand of 10,522, resulted in 2.63 providers. For primary care the total RVU demand of 41,942 resulted in a requirement for 10.36 family practice providers. These results are shown in Table 8.

Table 8

Provider Requirements Using Workload

Service	Total RVU	RVU/Provider/day	RVU/Provider/work year	Work Days	Providers
OB/GYN	14,845	15.4	963	260	4.28
Pediatrics	10,522	15.4	683	260	2.63
Primary Care	41,492	15.4	2694	260	10.36

This proposal suggests staffing an off-post, primary care clinic with contract personnel. Arguably, they could be contracted in less time than it would take to create General Schedule positions and then hire against those positions (Dr. Karin Zucker, Professor, United States Army-Baylor Health Care Administration Program, personal communication, May 21, 2005). These providers would be, or would become, members of the local community and would not be subject to deployment or field training, thus promoting continuity of care. The cost of these contract providers is shown in Table 9.

Table 9

Cost of Contract Providers in Dollars

Service	Cost in Dollars	Model	Actual	Division of Labor	Cost in Dollars
Family Practice		5.71	10.36		
Physician	186,953			4	747,812
Nurse Practitioner	87,627			3	262,881
Physician Assistant	87,791			3	263,373
Pediatrics		5.71	2.63		
Physician	176,545			1	176,545
Nurse Practitioner	87,627			1.5	131,441
Obstetrics		7.27	4.28		
Physician	281,528			2	563,056
Nurse Midwife	92,235			2	184,470
Admin & Support Staff					
Administrator	85,625			1	85,625
Nurse Manager	91,715			1	91,715
Registered Nurse	69,418			2	138,836
Licensed Practical Nurse	45,002			12	540,024
Medical Assistant	34,792			28	974,176
TOTAL					4,159,954

Note: From Salary.com, 2005

As noted in Reeves' article, previously referenced on page 35, *supra*, "Special circumstances within a practice may account

for staffing levels that are higher or lower than the benchmarks" (2002, p. 2). In this case, the assumption was made that there would be overlap among the providers. This means that family practice providers would see pediatric patients; therefore, fewer pediatric providers would be required. The family practice provider may also provide care for patients in the other primary care categories; thus, helping to absorb some of their staffing needs. At BACH, family practice physicians do not deliver babies; therefore, they would not assist with obstetric patients (Gregory T. LaFrancois, Deputy Commander for Administration, Blanchfield Army Community Hospital, personal communication, May 23, 2005). As discussed previously, beneficiaries over age 65 would not be enrolled to the off-post, primary care clinic. Additionally, BACH may be relied upon to see some of these beneficiaries to alleviate the need for 7.27 obstetric providers. BACH is the parent organization for two health clinics on Fort Campbell and ensures care is delivered to eligible beneficiaries. At BACH, obstetric demand is not uniform; beneficiaries from the off-post clinic may be referred to a network provider if capacity is exceeded (Gregory T. LaFrancois, Deputy Commander for Administration, Blanchfield Army Community Hospital, personal communication, May 23, 2005).

Logistics

The component of total expenses related directly to the facility, i.e., the physical plant, includes housekeeping, rent, utilities, and maintenance. These expenses vary greatly by location, and, of course, no location has been selected for the proposed clinic. As an example cost per square foot for outpatient clinical space in Clarksville, Tennessee, is shown in Table 10. This information was provided by the Corps of Engineers.

Table 10

Facility Expenses for Off-Post, Primary Care Clinic

Item	Cost in Dollars/SF	20,000 SF
Base Rent	24.25	485,000
Utilities	1.25	25,000
Insurance	0.15	3,000
Housekeeping	0.43	8,600
Medical Maintenance	0.50	10,000
Maintenance	1.56	31,200
Total		562,800

The clinic will be approximately 20,000 square feet. This square footage estimate comes from a preliminary program for

design completed at the United States Army Health Facility Planning Agency and is based on factors such as the type of services provided and number of beneficiaries served (Program for Design, 2004). There will be a one-time initial cost of \$400,000, \$20 dollars per square foot, to either retrofit or for the government pro-rata share of a build-to-suit structure (Major Chadwick Bowers, Chief, Logistics Division, Blanchfield Army Community Hospital, personal communication, May 24, 2005).

There would also be a one-time surcharge, estimated at 10,000 dollars, for negotiation of the contract for the building. This surcharge is the standard set by the Louisville Corps of Engineers and is 2.5% of the \$400,000 for leasehold improvements (Major Chadwick Bowers, Chief, Logistics Division, Blanchfield Army Community Hospital, personal communication, May 24, 2005). These costs are not included in the comparisons between BACH and the off-post, primary care clinic. The average logistical cost per RVU is $562,800/66,859$ (total RVUs from ob/gyn = 14,845 + pediatrics = 10,522 + primary care = 41,942) = \$8.41 per RVU.

Because this off-post, primary care clinic would run under the same governance and utilize the same policies, procedures, and supply chain as BACH, it is reasonable to assume supplies will remain at the same cost per RVU -- \$19.00 at BACH. This

cost will be applied to the supply cost for the clinic. Table 11 presents a cost comparison between the proposed clinic and BACH.

Table 11

Costs for the Off-Post, Primary Care Clinic

Topic	Cost in Dollars
Personnel	4,159,954
Supply	1,270,321
Facility	562,800
Total	5,993,075
RVU FY 2006	66,859
Off-Post Cost per RVU	89.64

From these cost comparisons it is evident that an off-post, primary care clinic would be a feasible option. The off-post, primary care clinic would cost \$14.92 more per RVU or 20% above the cost of delivering the care at BACH⁸. Staffing the off-post, primary care clinic with contract personnel increases the cost, but is an appropriate method for delivering care outside of the MTF because it allows for flexibility. It is possible that over time, these contract personnel could be converted to General

⁸ BACH cost per RVU is 74.72 (Jackie Ashby, Chief, Medical Expense Performance Reporting System Branch, Resource Management Division, Blanchfield Army Community Hospital, personal communication, April 12, 2005).

Schedule employees. If that were done, the savings, compared in 2005 dollars, would total \$233,679. Table 12 shows the cost of General Schedule employees.

Table 12

General Schedule Employee Cost

Service	Pay Grade	Annual Salary	Recruitment Bonus	Benefits	Total	#	Total
Family Practice							
Physician	GS-14/10	116,833	29,208	31,545	177,586	4	710,344
Nurse Practitioner	GS-11/10	64,019	14,703	17,304	96,026	3	288,078
Physician Assistant	GS-11/10	67,859	10,179	18,322	96,360	3	289,080
Pediatrics							
Physician	GS-14/10	116,833	29,208	31,545	177,586	1	177,586
Nurse Practitioner	GS-11/10	64,019	14,703	17,304	96,026	2	144,039
Obstetrics							
Physician	GS-15/10	128,469	32,117	34,687	195,273	2	390,546
Nurse Midwife	GS-11/10	64,019	14,703	17,304	96,026	2	192,052
Admin & Support Staff							
Administrator	GS-09/05	47,340		12,782	60,122	1	60,122
Nurse Manager	GS-11/5	57,280		15,466	72,746	1	72,746
Registered Nurse	GS-10/05	52,136		14,077	66,213	2	132,426
Licensed Practical Nurse	GS-05/05	31,247		8,437	39,684	12	476,208
Medical Assistant	GS-04/05	27,926		7,540	35,466	28	993,048
TOTAL							3,926,275

Source: Elizabeth Saez, Manpower Analyst, Blanchfield Army Community Hospital, personal communication, May 24, 2005).

This alternative has a significant challenge because there is a \$410,000.00 up-front cost for establishing the building. This adds to the amount of risk involved in the project, but does not preclude it from being a viable alternative.

Discussion

An off-post, primary care clinic will primarily attract female, family member beneficiaries between the ages of 18 and 34. Most likely, these women will bring their children to the clinic for care.

The family-centered care concept will serve as the foundation upon which the design of the clinic can be structured. This concept is a high priority for the BACH leadership as it focuses on enhancing the care-relationship by empowering patients, family, and care providers. Ideally, patients will have input into the design and construction of the clinic, ensuring their needs are met. Feedback from them will be used to improve processes at the clinic. Incorporating family-centered care into the planning phase of the clinic means having adequate space for family members in the examination rooms; offering evening and weekend hours for appointments, or at least surveying beneficiaries to see if they are needed and then acting on those survey results; and having a plan to monitor how well the clinic meets the needs of the beneficiaries.

The beneficiaries receiving care at the clinic will have access to the same resources available at BACH. They can utilize the appointment system at BACH to make their appointments and continue to have access to information and appointments through TRICARE Online. If referrals are required, they will be coordinated through the same case managers or personnel of the TRICARE service center.

On average, these beneficiaries will drive less than 20 miles to obtain primary health care services and will find that parking is readily available. A volunteer will greet and direct patients and their family members to the appropriate location. There will be volunteers available to watch children if they are not going to be with the beneficiary receiving care.

The flow of patients through the clinic will be similar to that at the Fairfax Clinic (see Appendix B). The logical design will assist providers in being efficient. Patients will be able to receive prescriptions at the clinic and will not have to travel on to Fort Campbell. They will be able to order refills through the automated system and pick them up on-site. The clinic will be centrally-located near shopping and grocery stores. The convenience associated with easier access, shorter driving distance, and proximity to other frequently-used services, will likely increase customer satisfaction. The services available at the off-post clinic will include family

practice, pediatrics, and obstetrics/gynecology. The providers on site will have appropriate ancillary staff to deliver safe and effective care for these beneficiaries. By applying historical usage patterns the off-post, primary care clinic will relieve BACH of a significant workload.

Recommendation and Conclusions

The purpose of this study was to determine the feasibility of an off-post, primary care clinic as an alternative to meet the increased demand for health service for beneficiaries in the Fort Campbell catchment area. This study supports that concept. As stated by a previous Baylor Administrative Resident from Fort Bragg,

In order to succeed in the future, the military health care system has to be competitive with the civilian health care system while maintaining a high level of quality. This involves an aggressive, efficient and effective approach to managing and providing for patient demand (Pacchiana, 1997, p. 61).

This statement is true in the health care model that we are currently utilizing and should guide decisions for the future.

At BACH, there is an embedded, cultural emphasis to focus on family and community-centered care. This perspective is supported by the command and the cohesive nature of the area's military families and communities.

Through an off-post, primary care clinic, BACH, the parent unit, will expand access and, thereby, encourage and promote prevention and wellness within the community (DoD TRICARE Management Activity, 2001). It will provide flexibility for BACH's long-term strategic planning efforts. As the needs of the population change, the services delivered at the clinic can be modified to meet requirements.

By leasing the clinic, BACH will be able to make adjustments, as needed, to meet mission requirements. Development of an off-post, primary care clinic will clearly demonstrate a strong, caring commitment.

Appendix A: Definition of Terms

ASAM	Automated Staffing Assessment Model
BACH	Blanchfield Army Community Hospital
CHAMPUS	Civilian health and Medical Program of the Uniformed Services
DEERS	Defense Enrollment Eligibility Reporting System
DoD	Department of Defense
DMIS	Defense Medical Identification System
HIPAA	Health Insurance Portability and Accountability Act of 1996
MHS	Military Health System
MTF	Military Treatment Facility
M2	Management Analysis and Reporting Tool
NAVCARE	Navy Care
PRIMUS	Primary Medical Care for the Uniformed Services
RBRVS	Resourced Based Relative Value System
RVU	Relative Value Unit

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