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A Joint Venture Analysis for a Combined Acute/Chronic Hemodialysis Clinic at Tripler Army Medical Center

A Graduate Management Project Submitted to:

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14. ABSTRACT
The objective of this study was to determine the cost effectiveness and strategic implications of expanding the existing dialysis clinic at Tripler Army Medical Center (TAMC) to allow Veterans Administration (VA) beneficiaries access for chronic dialysis care. The study analyzed the costs incurred by the VA during FY2002 at private dialysis facilities and at TAMC. The fixed, variable, direct and indirect costs were analyzed and used to produce cost projection models for an expanded acute/chronic dialysis facility. Step costs for additional staff were built into the models and pharmaceutical cost projections were estimated based on historical data. Strategically, the study indicated that it is in TAMCs best interest to focus on related diversification and expand to meet the chronic dialysis needs of the VAs beneficiaries. Financially, through this project, TAMC would be able to significantly reduce its dialysis treatment costs and provide a competitive price with the market while simultaneously exceeding the other island dialysis providers staffing ratios and skill sets. Based on the results of this study, it is recommended that a Joint Venture Acute/Chronic Hemodialysis Clinic staffed to support 28 chronic plus four acute/inpatient beneficiaries be initiated.

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ABSTRACT

The objective of this study was to determine the cost effectiveness and strategic implications of expanding the existing dialysis clinic at Tripler Army Medical Center (TAMC) to allow Veterans Administration (VA) beneficiaries access for chronic dialysis care. The study analyzed the costs incurred by the VA during FY2002 at private dialysis facilities and at TAMC. The fixed, variable, direct and indirect costs were analyzed and used to produce cost projection models for an expanded acute/chronic dialysis facility. Step costs for additional staff were built into the models and pharmaceutical cost projections were estimated based on historical data. Strategically, the study indicated that it is in TAMC's best interest to focus on related diversification and expand to meet the chronic dialysis needs of the VA's beneficiaries. Financially, through this project, TAMC would be able to significantly reduce its dialysis treatment costs and provide a competitive price with the market while simultaneously exceeding the other island dialysis provider's staffing ratios and skill sets. Based on the results of this study, it is recommended that a Joint Venture Acute/Chronic Hemodialysis Clinic staffed to support 28 chronic plus four acute/inpatient beneficiaries be initiated.

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Introduction

Overview of Tripler Army Medical Center

Tripler Army Medical Center (TAMC) is located on the island of Oahu, Hawaii and is the largest tertiary medical treatment facility in the Pacific Basin. An estimated 800,000 people are eligible to receive care at Tripler and its area of responsibility spans more than 52% of the earth's surface.

The medical center routinely provides inpatient and outpatient care to 59,000 active duty beneficiaries of all military services, 72,000 active duty family members, 13,000 retirees, 17,000 retiree family members, and 127,600 veterans. Tripler Army Medical Center also supports a referral population including 186,000 United States Army Pacific Command military and family members and 385,392 people from the Independent Pacific Island Nations.

Tripler Army Medical Center is a major medical teaching facility and provides graduate level training programs in medicine, general surgery, otolaryngology, orthopedic surgery, psychiatry, pediatrics, obstetrics and gynecology, radiology, pathology, urology, oral surgery, hospital administration, and anesthesiology nursing (Tippy, 2002).

The Spark M. Matsunaga Veteran's Administration Medical and Regional Office Center (VAMROC) Honolulu provides a broad range of primary medical care services and veteran's benefits, serving

an estimated 127,600 veterans throughout Hawaii and the Pacific Islands. The Honolulu VAMROC provides primary outpatient medical and mental healthcare through the Ambulatory Care Clinic on Oahu (Honolulu) and through five Community Based Outpatient Clinics (CBOCs) on the neighboring islands.

The Honolulu VAMROC, provides outpatient primary medical care, mental healthcare, dental care, specialized outpatient treatment through programs such as Substance Abuse, Day Treatment, Geriatric Evaluation and Management, and several medical specialty clinics staffed by Veterans Administration (VA) and University of Hawaii faculty physicians. The new VA Ambulatory Care Center, recently activated in May 2000, is located at TAMC as part of the VA-Department of Defense (DoD) Joint Venture. Since Hawaii is without a VA hospital, under the auspices of Public Law 97-174, VA/DoD Health Resources Sharing and Emergency Operations Act of 1982, TAMC serves as the inpatient medical facility for VA in Hawaii, American Samoa, and Guam (Tippy, 2002).

Conditions That Prompted the Study

In 1997, Americans spent $1.1 trillion on healthcare, consuming 13.5 % of the nation's gross national product (GNP). The healthcare sector consumed $1.3 trillion in 2000, estimated at 14 % of the GNP. As measured by percentage of the GNP, the resources devoted to healthcare in the United States have more

than tripled since 1950 (Gapenski, 2001). Each year, healthcare consumes a larger percentage of the GNP. With each additional dollar spent on healthcare, there is an opportunity cost with a potential corresponding reduction to other programs. Congress has incrementally allocated a larger percentage of its budget to healthcare and made cuts in other sectors to accommodate healthcare increases (Lee, 2000). The most common reasons cited for the escalating healthcare costs are the rapid advances in technology, an aging population, society's views of the value of life, third party payer systems, malpractice insurance, and operational and administrative inefficiencies (Gapenski, 2001). The United States legislative body has sought the means to curb its annual expenditures for healthcare for decades. One approach to cost savings was through DoD and VA resource Sharing.

Twenty years ago, Congress authorized the sharing of healthcare resources between the DoD and the VA. This was intended to allow more effective and efficient use of those healthcare facilities and healthcare dollars. All VA hospitals within fifty miles of a military treatment facility were required to produce multi-service agreements. Before the law passed very few DOD and VA facilities were involved in any form of resource sharing.

In 2002 the combined healthcare budgets of the DoD and the VA was nearly $40 billion. From a recent analysis of the DoD/VA

Healthcare Resource Sharing Program, there is congressional concern that over the past twenty years the DoD and VA have not taken sufficient steps to maximize efficiencies. Congress felt that the DoD and VA have neither maximized healthcare access nor improved the healthcare for each other's beneficiaries (HR2667, 2001). For these reasons, Congress recently revised the law. It was introduced to Congress as The DoD/VA Healthcare Resources and Performance Improvement Act of 2002, and it is intended to extensively revise title 38 United States Code (U.S.C.). Section 8111 by introducing new policies and guidelines to improve VA/DoD coordination and sharing. It will require a demonstration project. Congress will provide designated locations with millions of additional dollars, annually, to establish projects and healthcare services designed to demonstrate the advantages of an integrated health care system. Congress is expecting results and requires three demonstration sites for conducting the project. TAMC has been cited by Office of The Surgeon General, Army, as a preferred location to serve as one demonstration site.

TAMC has been working closely with the VAMROC for several years and has implemented a number of resource sharing programs. TAMC and VAMROC are continuously researching new opportunities to share resources and conserve federal healthcare dollars. Currently, TAMC has the mission to provide acute hemodialysis

treatments and nursing care to inpatients requiring dialysis. The workload for this mission averages three inpatients per day. In addition to these inpatient/acute dialysis patients, the TAMC hemodialysis section currently treats up to twelve eligible chronic dialysis patients from the VA on a space available basis. Each chronic dialysis patient requires treatment approximately three times a week. Each treatment lasts from three to five hours. The additional VA workload facilitates maintenance of skills for the TAMC personnel working in the hemodialysis section.

The VA on Oahu does not have a hemodialysis unit. The majority of its beneficiaries requiring chronic hemodialysis treatment must be referred to private providers on the island. There are currently two main providers of this service on the island of Oahu: Fresenius Medical Care North America and St. Francis Healthcare System of Hawaii. VAMROC estimated that they pay approximately $350 per patient treatment. This equates to more than one million federal healthcare dollars being paid to private organizations in Hawaii, annually. The TAMC Commander wanted to determine if the Federal Government could save healthcare dollars and benefit TAMC's patrons by expanding the dialysis facility to create a joint hemodialysis clinic capable of supporting both acute and a larger quantity of chronic case requirements.

Statement of the Problem

Tripler Army Medical Center and VAMROC need to determine if a joint dialysis clinic will save federal funds and improve the quality of care.

Literature Review

Kidney Failure

The number of Americans with kidney failure is growing by six percent a year and the United States is leading the world in the number of cases per million. The number of patients awaiting transplantation continues to grow disproportionately to available kidneys from cadaver transplants (Cooper, 1999). Nephrologists have noted that the numbers of End Stage Renal Disease (ESRD) patients have virtually doubled since the 1990's and with the ageing baby boomer population there will be ever increasing incidences of diabetes and hypertension, the two leading causes of kidney failure. Without transplantation, "hemodialysis is the only alternative for survival" (Cooper, 1999).

Dialysis

Properly functioning kidneys process about 200 quarts of blood per day and filter out about two quarts of waste product. The filtering occurs in millions of tiny units within the kidney called nephrons. Each nephron contains a glomerulus, a tiny

blood vessel that intertwines with the urine collecting tube called a tubule. A chemical exchange takes place at the tubule to remove waste and excess water from the blood. In addition to removing waste, the kidney releases several important hormones: erythropoietin (EPO), renin, and an active form of vitamin D. Erythropoietin stimulates bone marrow to produce red blood cells. Renin regulates blood pressure, and vitamin D helps maintain calcium essential for bones (NIH, 2002). Once the kidneys cease to function properly, dialysis may become necessary. Dialysis treatment removes excess water and waste from the body. Sometimes dialysis treatments are only needed temporarily until the kidney resumes normal function, but once loss of kidney function becomes permanent, a patient can either get a kidney transplant or require dialysis on a regular basis. Kidney transplants may come from related or non-related donors but, more importantly, the donor's kidney must be a close match to the recipient's or their body will reject the transplanted organ. It is estimated that only one donated kidney in 1,000 will match a recipient (NIH, 2002).

There are currently two types of dialysis. The first method is peritoneal dialysis, which uses a filtration process where the blood is cleaned within the body. The second method, hemodialysis, circulates the blood from the body through an artificial kidney machine, filters it, and then returns the

filtered blood to the body. The machine's filter is called a dialyzer, which is a large canister containing thousands of small fibers through which the blood is passed. "Dialysis fluid, the cleansing solution, is pumped around these fibers, allowing waste and extra fluids to pass from the blood into the solution. The membrane of the dialyzer retains the waste and water and returns the cleaned blood to the body" (NIDDK, 2002). Hemodialysis is the most common method used to treat advanced and permanent kidney failure and is the method utilized at TAMC.

Kidney failure is a significant concern in the Veteran's Health Administration population. The average age of a VA beneficiary is 61 and due to this, these patients are more likely to have several co-morbidities, including renal failure (Fed. Prac., 2003). Providing care for patients with renal failure and several co-morbidities is very expensive.

Iron Triangle of Healthcare

Access, quality and cost are often referred to as the Iron Triangle of Healthcare.

> Access to, costs of and expenditures for, and quality of care are often inextricably linked. Increasing access to care, as was done through the passage of Medicare and Medicaid legislation in 1965, inexorably leads to increases in utilization, and thus increases in the cost of and expenditures - both public and private – for care.

> Unprecedented expenditure increases prompt decision makers to look for ways to reduce them, such as instituting controls on utilization and constraining provider payments. Increases and decreases in utilization bring quality of care into focus. Too many or too few services can compromise the quality of care, and poor quality of care can ultimately result in higher expenditures to correct the problem. Achieving a satisfactory balance among these values remains a major challenge as the U.S. health services system continues to change. (Barton, 1999,p.8)

The Iron Triangle is no different for the DOD or the VA. Cost, quality, and access are a daily challenge that senior commanders and military healthcare executives must balance in order to achieve fiscal solvency, maximize patient outcomes, and ensure beneficiaries have the means to enter the appointment system to receive appropriate treatment in a timely manner.

Quality

"Mortality rates among U.S. hemodialysis patients are the highest in the industrialized world at 23% per year. Measures of dialysis dose correspond strongly with survival and are inadequate in one sixth of patients. Inadequate dialysis is also associated with increased hospitalizations and high inpatient costs. Previous analysis has identified three barriers to adequate hemodialysis. They are: dialysis under-prescription,

catheter use, and shortened treatment time" (Sehgal, et al., 2002). These same issues came to light through research of the dialysis facilities here in Oahu.

A study conducted by Sehgal et al., in 2002 in dialysis facilities in Ohio, found that many patients do not receive higher efficiency dialyzers either due to cost or because the facility's dialysis machines are technologically outdated and incompatible with the newest filters. In some cases, tight facility schedules did not allow increased treatment times, which results in inadequate dialysis. Lastly, either the patients or the physicians did not approve of fistulas or grafts, which are critical for long-term access to arteries. The study also noted that some Nephrologists were unaware of low prescriptions because they do not explicitly calculate prescribed Kt/V (Sehgal, et al., 2002). Kt/V is a function of the amount of urea removed multiplied by the time on dialysis, divided by the volume of urea distribution, or approximately the amount of water in the body. It is used to monitor the adequacy of the dialysis treatment. Low prescription can result in the patient's condition deteriorating and cause inpatient stays. One of the estimates in Sehgal's study estimated the potential saving of $1,880 annually for each dialysis patient by providing adequate outpatient dialysis and avoiding costly inpatient care (Sehgal, et al., 2002).

In another study conducted by Dr. P.J. Devereaux et al., it was discovered that there is a higher mortality rate associated with for-profit dialysis providers than non-profit/government providers. "Six of eight studies demonstrated a statistically significant risk of death in private for-profit dialysis facilities" (Devereaux et al., 2002, p7). The findings had a 95% confidence interval. This equated to a range of 1,200 to 4,000 patient deaths that could be avoided annually. Potential reasons for this higher mortality rate are staffing ratios, poorly trained nurses and technicians, re-using dialyzers, and shorter dialysis times.

In January of 2002, the Department of Health and Human Services, Office of the Inspector General (DHHS-OIG), produced a report on clinical performance measures for dialysis facilities. Lessons learned from the five largest dialysis corporations were the basis for the creation of clinical performance measures designed to hold facilities accountable for the quality of care. The DHHS-OIG's recommendations were to conduct educational forums that emphasize the importance of performance measures, examine the possibility of physician specific report cards, and to focus greater attention on the responsibilities of physicians (DHHS-OIG, 2002). In an effort to benchmark and improve standards, Center for Medicare and Medicaid Services (CMS) has implemented facility tracking measures and posted dialysis

facility data to its website that can be used to compare existing facilities by state. The quality indicators or measures identified by CMS are (1) the percent of patients at a facility with a Urea Reduction Ratio (URR) of 65 or greater (also known as the adequacy of hemodialysis), (2) the percent of patients treated with EPO with a hemocrit of 33 or greater, and (3) patient survival information (CMS, 2003). The CMS website contains information and provides comparisons between 13 dialysis facilities throughout the Hawaiian Islands. Although CMS identified 18 dialysis facilities, data were not listed for five facilities. Only one facility in Oahu demonstrated worse than expected outcomes. The remaining twelve demonstrated as expected results meaning that the facility fell within the acceptable range of performance by CMS criteria. No facility demonstrated better than expected results (CMS, 2003).

Staffing

ESRD patients are generally extremely sick patients with multiple co-morbidities. As stated earlier, two of the leading causes of kidney failure are diabetes and hypertension. Over years these conditions "lead to damaged blood vessels, heart disease, stroke, blindness, kidney disease, nerve problems, gum infections, and amputation" (CDC, 2002). This population will continue to increase with the aging of the baby boomer generation. Therefore, it is important that dialysis staffs have

the medical expertise and qualifications to manage their patients and acceptable staffing ratios be met. Currently, there is a great degree of variance in staffing for dialysis clinics throughout the United States. The island of Oahu also has disparity in the staffing standards of its various dialysis facilities.

Most facilities on Oahu utilize technicians to administer dialysis. Technicians, depending on where they work, receive initial training ranging from six weeks to three months. The ratio of technician to patients normally ranges between one to three but in some locations reaches one to five. Most facilities maintain one registered nurse for every four technicians. At different facilities, one registered nurse can be expected to supervise a range of 12 to 20 patients per shift. During the course of a normal workday, many of these facilities run two to three shifts (Cecil, A., personal communication, February 24, 2003).

The American Nephrology Nurse's Association (ANNA) is the largest professional nephrology group in the United States representing over 11,000 nurses working in this field. The ANNA has been attempting to work with congress to increase the quality of care for 300,000 plus ESRD patients throughout the country. The Association is concerned with the increased reliance on technicians in dialysis facilities due to Medicare

reimbursement rates being outpaced by inflation. The ANNA has noted increased patient ratios, increased use of technicians as a substitute for LPNs, and re-use of certain supplies such as filters (ANNA, 2000).

Several states are attempting to enact legislation to ensure adequate staffing ratios for kidney dialysis units. Connecticut, for instance, proposed legislation in January of 2003 requiring that no more than 50% of the dialysis staff be technicians and that technicians be supervised by an on site registered nurse (Senate Bill 553 File 198). Massachusetts established similar staffing requirements. Massachusetts' bill mandates that there must be no greater than a one to three, staff to patient ratio. It also requires a registered nurse be present and that if there are separate rooms, a direct care staff member is present at all times in each room (Circular Letter: DHCQ 01-08-415, 2001). Currently, no such legislation exists in Hawaii.

In one statement found during literature research, an Arizona dialysis patient submitted a letter to a senate committee testifying that she had witnessed a notable decline in the quality of the technicians and an increase in the ratio of patients to staff. In some cases she had been one of six patients receiving treatment from one technician. Vascular access is critical for dialysis patients and if a technician

repeatedly fails to insert the needle properly, it is painful, increases the risk of infection, and can destroy the access. She also stated that poorly trained, unsupervised technicians have, in the past, miscalculated target weights, used too much or too little heparin, utilized the incorrect dialyzer on patients, and disregarded universal antiseptic codes. Any of the above can result in hospitalization or fatalities (Smith, 2000). Dr. Jerome Tokars conducted a study on infection rates in 2002, which examined infection rates in hemodialysis patients. He concluded that better standardized monitoring and reporting systems must be established. He and his colleagues felt it was critical to establish benchmarks and relay performance back to the employees of the difference dialysis facilities (Tokars et al., 2002). The American Nephrology Nurses' Association has also expressed its concern on this infection issue. The ANNA feels that there needs to be improvements in teaching, care and prevention, in addition to well-trained staff with a proper staff to patient ratio (ANNA, 2002).

Access

Hawaii is currently facing a shortage of working nurses on the island of Oahu. Due to this shortage, TAMC has been forced to hire temporary contract nurses from the mainland for six to twelve month rotations in order to fill vacant positions. There is significant nursing turnover from the various hospitals on

the island, and while there are plenty of dialysis machines in private facilities on island, frequently there are not enough nurses to utilize the machines. During the past year the VA has had difficulties placing beneficiaries who require dialysis. In some instances, TAMC has agreed to accept these chronic patients in addition to performing its acute mission. At times, this stretched TAMC's small dialysis staff to the maximum.

Recently there was a full scale nursing strike on the Island of Oahu. Due to the fact that Hawaii already has a shortage of nurses working on Oahu, the strike severely impacted the operations of St. Francis Healthcare system, Queen's Medical Center and Kuakini Health system. St. Francis was forced to reduce the amount of dialysis time each patient received due to nursing staff shortages during the strike period. The strike affected approximately 1,000 kidney dialysis patients. Because of the decrease in dialysis time, patients were placed on an emergency diet limiting their fluid intake and foods with high potassium (Danninger, 2002). Incomplete dialysis over a period of time can have severe medical consequences.

Dialyzers

Dialyzers, as stated earlier, are the artificial kidneys used in the dialysis process. Every patient has his/her own dialyzer for each treatment provided, which are normally utilized one time and then disposed. However, many facilities

have adopted the practice of re-using dialyzers to reduce costs. Dialyzers can range from $20 to $40. If disposed of after each use, it will create an annual variable cost per patient of $2,880 to $5,760. Some facilities are re-using the dialyzers as many as thirty to fifty times. It is extremely important that the dialyzers be cleaned, sterilized, and catalogued to match the original user. The efficiency of re-used dialyzers can decrease as much as 20% before they must be discarded. This is a healthcare dilemma of efficiency vs. effectiveness. While some patients see this as detrimental to their treatment, others in the industry view this as cost avoidance. The National Kidney Foundation has even developed a Clinical Practice Guideline (CPG), which directs the suspension of reprocessed dialyzers if a patient's Kt/V falls below a certain level (National Kidney Foundation, 1997). One of the major dialysis providers in Hawaii is currently re-using dialyzers in their facilities. This practice will be discontinued once a new production facility is fully operational and more dialyzers are produced to meet current demand.

Cost

As stated earlier, U.S. healthcare expenditures continue to grow at a faster rate than the GNP. Money is a finite resource and there is significant pressure from the U.S. Congress to control expenditures. At the same time, Congress expects

increased quality of care and increased access to care. To successfully execute this, more efficient healthcare models must be designed. To identify the most efficient models, costs must first be clearly identified.

Cost Accounting

One of the primary reasons for cost accounting is to allow managers to better plan and control the operations of the organization. Planning allows managers to anticipate whether a new service is likely to make or lose money. By planning ahead, advantageous opportunities can be undertaken and problematic ones avoided (Finkler, 1999). Cost accounting is useful for managers in a number of areas, to include strategic planning and profitability analysis. Utilizing cost accounting in conjunction with strategic planning helps organizations ensure they are dedicating funds into the right capital investments. The primary goal of any cost analysis, such as that proposed by this study, is to analyze potential capital investment opportunities to decide whether or not these are viable projects in which to invest. Capital investments can be evaluated in a variety of ways. These are the financial returns (quantitative) and non-financial returns (qualitative)(Neumann, 1988). The TAMC-DOD/VA Joint Venture Hemodialysis Clinic proposal should be analyzed in both respects. In this venture, the collective sum of the financial savings recognized by the VA and DOD, the political

capital, and the quality of life and health status of VA beneficiaries must all be considered. The financial returns in this analysis will not only be represented by actual revenues to TAMC, but will also be accounted for as a reduction in the total dollar amount of claims paid on behalf of VAMROC beneficiaries to Non-DoD providers on the island of Oahu. Although this does not currently provide a direct financial incentive to Tripler Army Medical Center or the Department of Defense, the collective annual cost to the Federal government for dialysis in the state of Hawaii may decrease.

In order for TAMC to ensure that the venture is economically viable, a program budget or business plan should be developed. The program budget should consider expected revenues and expenses related to the program over a period of years (Finkler, 1999). This will allow TAMC to determine whether or not there will be a financial loss or gain. Program budgets combine all the elements of capital budgets and operational budgets, consider all revenues and expenses, and incorporate cash flow implications. Business plans consider all of the financial implications of proposed ventures to determine if they are financially feasible (Finkler, 1999).

The most widely utilized methods of evaluation for capital expenditures are the payback method, the accounting rate of return method, and a group of discounted cash flows methods.

The payback method calculates the amount of time required to recapture the amount invested. The advantage of this method is that it focuses on risk. The longer the amount of time to recapture the investment, the riskier the venture is considered. However, it fails to consider the timing of the cash flows and therefore does not recognize potential profitability. The accounting rate of return calculates the profitability of an investment by dividing the profits it earns by the amount of the investment. The higher the rate of the return the more valuable the investment is considered. The accounting rate of return method is better than the payback method because it considers the entire set of profits over the life of the investment. However, this method also fails to recognize the timing of the cash flows (Finkler, 1999). The discounted cash flows method converts future inflows and outflows of cash into their present value. Once future values are discounted, they can be compared to assess the financial performance or rate of return. The rate of return on an investment of plant and equipment, such as dialysis machines and structural changes to TAMC, is typically called the internal rate of return (Gapenski, 2001). The premise of discounted cash flows is that a dollar today is worth more than a dollar tomorrow. A discount rate must be determined in order to produce the calculations. The United States Army Medical Command (MEDCOM) utilizes a discount rate of 2.1% in its

business case analysis (BCA)(Circ. A-94, 1992). This rate will be applied in this venture capital analysis. Once all the future cash flows of the dialysis clinic venture are discounted to the present value, the calculated value of those cash streams is called the net present value (NPV). If the NPV is greater than zero, then the project will be considered financially viable. Military medical facilities are not supposed to make a profit. They should attempt to recover costs. In the terms of the VA/DOD Joint Venture Guidelines, negotiated rates should reflect the actual cost of producing the resources or services at the location at which the care is provided. They can be less than, but not exceed, the facility's Medical Expense Performance Reporting System (MEPRS) developed cost factors. The rates can be negotiated and do not have to follow interagency rates such as CMAC and, depending on local conditions, may be more or less than the interagency rate.

Tripler Army Medical Center already owns many of the machines required to perform the chronic and acute care dialysis mission. In the recent past, TAMC invested funds to upgrade the reverse osmosis units for the clinic. Reverse osmosis is a filtration process used to purify water by removing salts and impurities from regular tap water making it acceptable for dialysis use. Previously purchased equipment and expenditures are often referred to as sunk costs. A sunk cost is an outlay

that has already occurred and is irrevocably committed. Therefore, it should not have any effect on the decision to accept or reject a new project. Occasionally, projects appear to be unprofitable when these sunk costs are included. The reality of sunk costs is that whether or not the project is undertaken, the money has been spent and therefore should be irrelevant to the decision (Finkler, 1999). Accordingly, this study removed costs such as the reverse osmosis upgrade that were previously executed.

Strategic Benefits

There are several non-financial benefits, which must also be considered in the project. These benefits can be recognized through review of the strategic management process in healthcare organizations. The strategic management process occurs within the organization's context referred to as the organizational setting, or it's external environment. This setting is composed of the general environment and healthcare environment, which affect one another as well as the organization (Ginter, 1998). The general environment consists of government organizations, business organizations, educational institutions, religious institutions, research organizations, and the consumer. The healthcare environment consists of planning/regulatory organizations, primary providers, secondary providers, provider representatives and patients.

In analyzing the external environment, healthcare managers derive information on technological, social, regulatory, political, economic, and competition issues. This allows managers to visualize opportunities and threats to the organization. Opportunities and threats should influence the strategy adopted by the organization (Ginter, 1998).

Hawaii has one of the highest rates of diabetes in the United States, affecting as many as six percent of Hawaii's residents. Diabetes can lead to kidney disease and in a study on Kidney and Urologic Diseases Statistics for the United States it was found that of the 424,179 people with ESRD, 150,404 cases were attributed as caused by diabetes. Diabetes is a disease that prevents the body from utilizing sugars properly. Because of this, the sugars stay in the blood, act like a poison, and cause damage to the nephrons. As some nephrons become diseased from the poison, other nephrons will compensate. The other nephrons compensate so well that the symptoms of chronic renal failure are not diagnosed until 90-95% of the kidney function is lost (Columbia University, 2002). With Hawaii's aging population, and a higher rate of diabetes, the financial burden of ESRD is increasing. As stated earlier, there are only two options for people suffering from end stage renal disease. One is a kidney transplant. Because of the difficultly in finding compatible donors willing to accept the risks involved and the wait of 2-4

years for kidneys from cadaver donors, the majority of people with this disease are treated with hemodialysis.

Of the two main providers of dialysis on the island of Oahu, Fresenius is the larger and in 2000, Fresenius' Hawaiian region claimed $14 million in gross revenue. Fresenius jumped to the Top 250 companies in 2001, with a 52.1% gain to $21.3 million in gross sales (Trifonovitch, 2002). The reason for the increase in sales was Fresenius' patient volume increased by more than 10% over 2001. This equated to approximately two hundred patients. The company opened an additional 24-station facility in Kapolei in 2001. The facility had the capacity to provide treatments to 144 additional patients. Fresenius has seven of these facilities in Hawaii. Currently, Fresenius and St. Francis dialysis facilities are operating at maximum capacity and placement of new patients is difficult. Projections for increased demand and sales are expected to range from ten to 12% annually. As a result, the VA could find it increasingly difficult to ensure placement of its beneficiaries for renal dialysis treatments in the private facilities of Oahu.

In an internal assessment of TAMC, the facility is currently at maximum capacity based upon its staffing levels and hours of operation. As of this report date, the TAMC hemodialysis clinic is currently open for chronic treatments three days a week for two shifts. The Department of Medicine

stated that it capped chronic care to eight patients and averages two acute patients daily. However, in conducting the research it was discovered that the clinic actually sees approximately 12 full time chronic dialysis patients and 3 acute patients or inpatients. It must be prepared to perform dialysis for acute patients 24 hours a day. There is one Nephrologist on the TAMC staff and one Nephrologist on the VA staff that currently spends the majority of his available time conducting research with the University of Hawaii. He could be made available part time to assist the chronic mission.

The current congressional mandate is driving the DOD and the VA to aggressively pursue opportunities to reduce costs, recognize efficiencies, and share resources. Politicians have determined that "federal health resources provided by the people of the United States through tax receipts are by their nature scarce and thus should be effectively and efficiently used" (HR2667, 2001). By entering into a joint venture and expanding its dialysis capacity, Tripler Army Medical Center and VAMROC have the opportunity to achieve several non-financial rewards. A dialysis clinic expansion will allow patients access to high quality healthcare, meet congressional mandate, as well as increase cohesion between the two organizations and their beneficiaries.

Purpose

The purpose of this study is to analyze the joint venture proposal from a financial and strategic perspective in order to determine if TAMC should expand its current dialysis clinic to enroll more chronic VA beneficiaries. The costs to expand and equip TAMC's current dialysis clinic must be determined along with the associated costs to include operating and maintenance costs. A proper staffing model must also be developed. The financial implication must then be considered in conjunction with the strategic benefits of the joint venture project. My hypothesis is that the Federal Government will save health care dollars through a joint venture project. The Federal Government will not only benefit from the financial savings but TAMC and VAMROC will benefit from improved relations with stakeholders.

Methods and Procedures

Data Sources

Dialysis outpatient charges, Civilian Health and Medical Program for the Uniformed Services (CHAMPUS) Maximum Allowable Charges (CMAC) rates for FY 2002, and VA billing data were gathered through various sources. Outpatient charges for VA beneficiaries were obtained through the TAMC Joint Venture Office and confirmed through the VA Business Office at TAMC. VA provided the billing data of beneficiaries receiving

hemodialysis at private facilities on the island of Oahu. CMAC rates were obtained though a TRICARE website (www.tricare.osd.mil/cmac/CmacDetails.cfm). TRICARE is a managed health care program for active duty and retired members of the uniformed services, their families, and survivors. Current Procedural Terminology (CPT) codes were obtained in the published Ingenix CPT Expert 2003, 3rd edition. Healthcare Common Procedure Coding System (HCPCS) data were pulled from the Ingenix HCPCS level II Expert 2003, 14th edition.

The Tripler Army Medical Center's MEPRS provided the cost data for TAMC's Hemodialysis Clinic. MEPRS is a cost allocation and management system that accumulates and reports expenses, manpower, and workload performed by Department of Defense fixed military medical and dental treatment facilities. This system is the basis for establishing a uniform reporting methodology that provides consistent financial and operating performance data to managers responsible for healthcare delivery (GPRMC, 2002).

Tripler's hemodialysis workload was extracted from the Department of Medicine's 2002 Dialysis Annual Workload Spreadsheet. All data were confirmed through a manual log maintained in the dialysis clinic.

Drug cost data, related to dialysis treatments, was pulled from MEPRS and confirmed through TAMC's Department of Pharmacy.

Billing data was then verified through TAMC's Joint Venture Office and the VA Billing Office.

A TOWS (threats, opportunities, weaknesses, and strengths) Matrix (see Appendix A) was produced pertaining to the dialysis expansion to see if the proposal aligned well with the TAMC's mission, visions and values (Ginter, 2000).

Ethical Considerations

The use of VA patient data presented ethical consideration. The protection of patient information and privacy was critical. VA data was provided without names or any identifiable data sets. Each patient was given a numerical code to shield his or her identity.

Calculations

The VA's private dialysis facility billing data was placed into Microsoft Excel (Microsoft Corp, 2000). Current Procedural Terminology (CPT) codes, Healthcare Common Procedure Coding System (HCPCS) codes, billing data, and patient codes were extracted from the VA spreadsheet and placed into the appropriate cells. There was complete data for the cost analysis of 14 patients over the 12 months in 2002. The data was then manipulated by the software and cell formulas added to allow useful analysis. Comparisons of patient costs by month or year, by CPT, drug costs, and CMAC reimbursement rates were produced.

TAMC's Resource Management Division pulled the TAMC MEPRS data on the hemodialysis clinic for Fiscal Year (FY) 2002. During the validation of the MEPRS data, the space attributed to the dialysis clinic in 2002 was 4,400 square feet. The clinic was recently re-measured and found to be 2,000 square feet. All direct and indirect costs based on space were therefore multiplied by a ratio to correct the amount of cost allocated (see Appendix B).

Three cost models were then produced (see Appendix C). The first methodology used to determine relevant costs was derived from a Graduate Management Project completed by Captain Robert Durkee in 2000. All direct MEPRS costs were included for labor, materials, maintenance, and depreciation. Indirect costs that were supporting the operations of dialysis were also included. These included expenses such as utilities, housekeeping, direct support, and non-revenue generating departments (Information Management, Logistics, and Department of Medicine). High-level management, readiness training, and force development MEPRS costs were not included. These were costs not relevant to the project (Finkler, 94).

The second model produced was based on previous Joint Venture initiatives conducted between TAMC and VA. In this model all direct costs were allocated at 100%, and all other step down costs were allocated at 60%.

A third model was produced with full direct MEPRS costs and only those step costs in direct support of Dialysis. It established the marginal costs. “Marginal costs are often referred to as incremental or out of pocket expenses” (Finkler, 1999, p. 17). It did not allocate many of the hospital’s infrastructure step-down costs, which would continue to exist at the same level whether the project was accepted or rejected. Additionally, the model did not capture many of the costs needed to sustain the hospital infrastructure and was therefore disregarded because it would not financially support long-term operations. It did, however, establish a baseline cost for which any amount above the baseline would represent contribution margin to hospital operating costs.

The data was then dissected and all applicable costs were separated into fixed and variable costs. An annual depreciation schedule was produced for all dialysis clinic equipment utilizing a straight-line (time) depreciation method (see Appendix D). “Straight-line (time) depreciation method divides the cost of the asset less any estimated salvage value, by the number of years of its expected life, to arrive at the annual depreciation”(Stickney, 2000, p.420). The total annual depreciation was then added into fixed costs. A Microsoft Excel spreadsheet was then used to build a template and produce a 12-month cost analysis of FY 2002 (OCT 2001 through OCT 2002).

The cost analysis of the FY 2002 TAMC dialysis data was used to determine the variable costs per procedure and the fixed costs that would remain constant despite increased volume of chronic dialysis patients. Another Microsoft Excel spreadsheet was then built to project the fixed, variable, and increased step costs to support a larger volume of patients (see Appendix E). The current volume of VA patients on the island of Oahu appears to support a model of up to 32 patients based on a 6-day workweek running 2 shifts per day. This included an average volume of 3.26 inpatient/acute dialysis patients. The TAMC dialysis clinic currently owns eleven fully functional dialysis machines. By running two shifts per day with only eight machines, a volume of 32 patients could be easily treated running a 6-day workweek of two shifts per day. This would allow three machines to be down at any time for maintenance.

The Department of Nursing, in conjunction with Department of Medicine, produced estimates of the nursing staff requirements to support various patient volumes. The Chief of Nephrology and the VA Nephrologist also provided input to the staff model. For a patient volume of 32 to include the acute dialysis mission (6-day workweek with 2-shifts per day), they concluded that three to four Registered Nurses (RN) and six to seven Licensed Practical Nurses (LPN) would be required. The literature review and research found a model that supported

these estimates (Jeffery, 2001). Based on this, the cost model was built with three RNs and seven LPNs. Many private facilities substitute technicians for LPNs. These technicians can be trained to operate the machines in 6 weeks to 3 months and cost approximately $10-15,000 less than LPNs annually.

The step costs of the increased staff were applied to the model, along with the fixed and variable costs to determine the total costs for a 12-month period. An acute/inpatient dialysis cost model was produced for 3.26 patients (see Appendix F), and an outpatient chronic dialysis cost model was produced for 28.74 patients. In many instances, inpatients requiring dialysis require a nurse and portable dialysis unit to be transported to the patient's ward in the hospital. This results in a 1:1, RN to patient ratio, and is therefore more expensive to treat than chronic patients located in the dialysis clinic where they may be treated at a ratio of 3 patients to 1 LPN. Because of this, the total cost of the 3.26 acute and inpatients was removed from the total projected costs of 32 patients, a more accurate cost model was then produced for the remaining 28.74 chronic dialysis patients (see Appendix G). A final spreadsheet was then produced to compare projected costs of VA patients downtown to the projected costs of patients at TAMC using all three models (see Appendix H).

Reliability and Validity

"Validity is the extent to which a test measures what we actually wish it to measure" (Cooper & Schindler, 2001, p 210). In order to ensure there is validity in this study, the data will be obtained from MEPRS. MEPRS is a cost management system that accumulates and reports expenses, manpower, and workload performed by Department of Defense fixed military medical and dental treatment facilities. It is the basis for establishing a uniform reporting methodology that provides consistent financial and operating performance data to managers who are responsible for healthcare delivery (GPRMC, 2002). It is the consistent performance of MEPRS that ensures its reliability. " A measure is reliable to the degree that it supplies consistent results" (Cooper & Schindler, 2001, p. 215).

Additional Calculations

During the course of obtaining and validating the different cost data, several shortfalls were noted. The Nephrologist's cost was not stepped into the TAMC Hemodialysis Clinic. All of the Nephrologist's costs were allocated against Nephrology Services during FY 2002. To rectify this, the total cost of the current Nephrologist was divided into 48 weeks. This removed the thirty days of annual leave so that his total cost would be divided by available workweeks and this established a weekly salary and benefits cost. Through an interview with TAMC's

Nephrology Service Chief, MAJ DeNunzio, an hour per week per patient-time was established (MAJ Troy Denunzio, personal communication, 30 OCT 02). This was then applied as a variable cost per patient visit and included in the cost model. Additional time was added for end of month reporting. These costs were then added into the cost models as a variable cost (see Appendix I). There are two columns in Appendix I with figures. The column on the left is the average variable Nephrology cost per treatment with the joint venture. The column on the right is the average variable cost for the current operation. Increasing the number of patients reduces administrative time per patient and therefore reduces the variable cost per patient visit.

Department of Pathology costs were also missing from the MEPRS data. To adjust, Pathology costs were separately obtained and allocated against Department of Nephrology. Through the Chief of Nephrology, monthly, quarterly, and annual Lab test requirements were obtained. This data was used to obtain the costs to TAMC through the Department of Pathology and Patient Administration. These lab costs were calculated from CPT code CMAC rates, then applied to the dialysis cost model as a variable cost per patient visit (see Appendix J).

Results

Cost Analysis

Tripler Army Medical Center can reduce costs dramatically by expanding its patient volume to 28.74 chronic dialysis treatments equating to 4,484 annual treatments. This would be accomplished over a 6-day workweek with two shifts per day. The VA will save an estimated $250,000 in its first year of operating a Joint Venture Chronic Dialysis Clinic treating 28.74 VA beneficiaries needing chronic dialysis treatment.

There were so few dialysis treatment procedures being conducted at TAMC during FY 2002 (2381), that the cost was approximately $370 per patient visit (see Appendix C). Downtown costs at Fresenius and St. Francis were much cheaper, averaging $232 per treatment. In FY 2002, the combined costs of the 26 chronic patients from the VA exceeded $1.24 million for dialysis related treatments and pharmaceuticals (the study analyzed the actual costs of 14 VA patients using private dialysis facilities and 12 VA patients being treated at TAMC). Cost projections were then produced for the TAMC Joint Venture clinic. Through an expanded Joint Venture project, TAMC would be able to provide dedicated treatment to 28.74 VA beneficiaries for $1.01 million annually. As a direct result of allocating the overhead and base operating costs to more than double the number of treatments (4992) and maximizing the productivity of the dialysis staff by

increasing the access to the number of VA beneficiaries, the per-treatment cost at TAMC could be reduced to approximately $225 (See Figures 1 and 2).

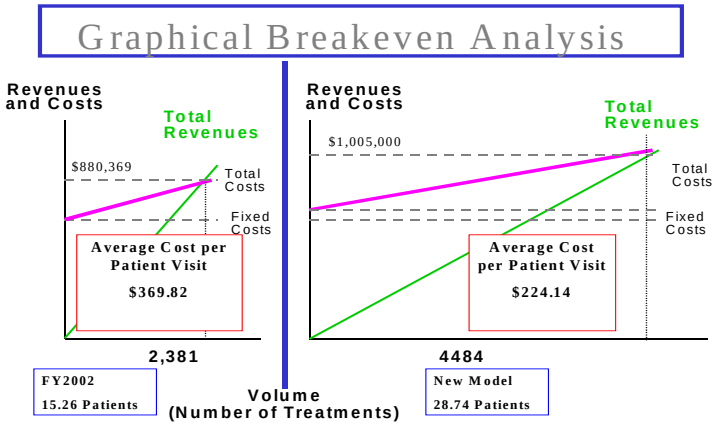

Figure 1. The figure above depicts the operating costs of the TAMC Dialysis Clinic for FY 2002 on the left. The average cost per treatment with drugs was $369.82. Under the new, expanded model, TAMC can reduce the cost per treatment to $225.

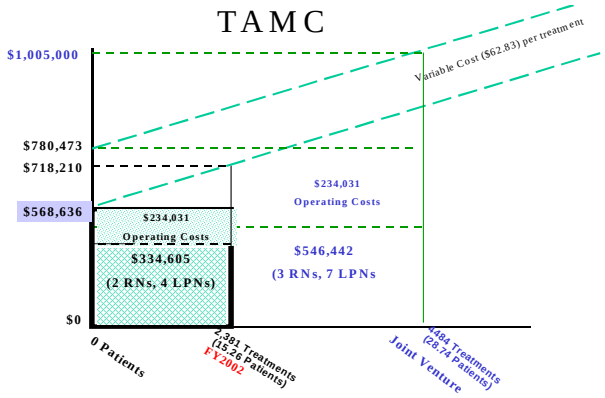

Figure 2. The x pattern depicts the base nursing staff cost that must be maintained in order to support TAMC's acute dialysis mission ($334,605). Above it the dot filled area depicts the fixed operating costs for the dialysis clinic in

FY2002 ($234,031). Combined, these costs are $568,636. TAMC will incur this combined cost annually, whether it treats one patient or 32. To the right of those filled blocks are the costs of the joint venture dialysis clinic. Increased staffing will cost $546,442. The fixed operating costs of $234,031 remain. The new total is $780,473. The diagonal line represents the variable cost of $62.83 per treatment. The expenses used to calculate variable costs are depicted in Appendix B. These include lab costs, the Nephrologist's time, pharmacy supplies, medical supplies, and miscellaneous supplies consumed by the dialysis clinic.

TAMC’s staffing model will continue to cost more than the local dialysis facilities due to the more expensive salaries of licensed practical nurses and the higher staff to patient ratio utilized at TAMC. However, through the study and dissection of the data, it was found that downtown dialysis facilities have a much higher use of EPO and other dialysis related pharmaceuticals (see Appendix H). In the aggregate, these higher variable costs make dialysis at TAMC less expensive than downtown dialysis facilities with the expanded 28.74 chronic patient clinic model.

EPO expenses and administrative handling charges from TAMC were placed into an excel spreadsheet to produce a per-unit cost. This was compared against the per-unit reimbursement costs

of what down town facilities were being reimbursed by the VA. The per-unit costs of TAMC and down town facilities were almost identical. However, the annual costs for FY 2002 were nearly double for the patients going to private dialysis facilities.

Previously cited literature indicated that inadequate dialysis treatments result in additional expenses of $1,800 annually per patient. This is sometimes referred to as the cost of quality (see Figure 3) (Finkler, 1999). This would equate to an additional expenditure to the VA of approximately $50,000 for 28 patients. Through analysis of the billing data set provided by VA, it was discovered that the fourteen VA patients utilizing downtown dialysis facilities averaged an additional $5,000 each in FY 2002 for other medical treatments and emergency room visits down town. There is the possibility that some of these costs may have been avoided.

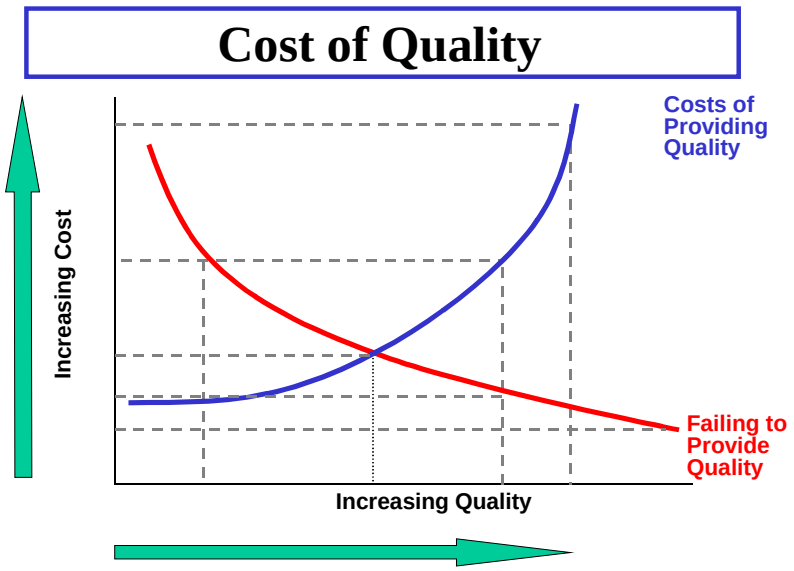

Figure 3 (Finkler, 1999, p.383). As quality increases (better trained staff, protocols, case management, quality assurance, and better staffing ratios), the cost of care is greater but there is a decline in the cost of poor quality. The patient is healthier, and therefore has fewer emergency room visits and inpatient stays. Their pharmaceutical costs are potentially reduced and therefore, in the aggregate, their total medical expenses may be reduced.

TAMC will also benefit from the expansion. Depreciation of the dialysis equipment has been incorporated into the cost model. It averages almost $60,000 per year (see Appendix D). Lab costs and Nephrology costs were also included into the current model. These expenses will be re-captured as a percentage of each dialysis treatment. In addition, many of the indirect costs associated with the dialysis clinic and allocated by MEPRS will be paid for through the revenues generated in the Joint Venture Hemodialysis Clinic. This equates to approximately $234,000 annually (see Figure 2 and Appendix E). The TAMC dialysis clinic will benefit from the increased staff and additional days of operation each week. The new staff's costs would be paid for through the additional workload and billing (see Figure 2 and Appendix E). This should equate to lower turnover rates, less on-call time, and higher morale of employees. With a larger pool of employees, there would be more flexibility in the work

scheduling and longer intervals between on-call duty. Due to the expanded days and hours of operation, many of the inpatients and acute dialysis patients may actually be treated during routine hours and result in cost savings to TAMC.

During the initial analysis, CMAC rates were built into the cost model and compared with VA payments to private facilities for FY 2002. The 90% CMAC rate reimbursement was approximately $100,000 less than FY 2002 disbursements from VA to downtown providers for 14 patients. One hundred percent CMAC reimbursement was $77,000 less. TAMC would lose approximately $150,000 to $200,000 annually if they accepted the CMAC rates while expanding to accept 28 VA patients. CMAC rate reimbursement will not be sufficient and will not allow both organizations to benefit (see Table 1). As discussed earlier, TAMC dialysis costs are greater than downtown facilities due to the more robust staffing ratios and use of LPNs instead of technicians. The cost savings to VA will be recognized in the aggregate through reduced drug prescription billing (see Appendix H).

Table 1.

CMAC Reimbursements compared to VA's FY 2002 Bills

VA Costs	Total Hemodialysis $323,699.75	CMAC RATE $ 246,485.37	90% CMAC $ 221,836.83
FY 2002 data 14 Patients		Difference $ 77,214.38	Difference $ (101,862.92)

Cost per Treatment	$ 148.21 Patient/visit	$ 112.86 Patient/visit	$ 101.57 Patient/visit
**	This does not include EPO or Drug Costs		

Strategic Impact

Expansion of the TAMC Dialysis Clinic aligns well with the strategic visions and values of both organizations. In September 2002, TAMC and VA senior staff members held an off-site strategic joint venture planning meeting. The final product produced from this meeting was that both entities agreed they should become a fully integrated federal academic healthcare system with one budget, Table of Distribution and Allowances (TDA)(personnel authorizations), information system, logistics system, ancillary support system, inpatient system, billing system, referral system, and should have an integrated committee structure. They desired to nurture a new culture with single unity of purpose. All redundant systems could be joined to reduce duplicate administrative costs and recognize efficiencies for federal healthcare dollars.

"Within the framework provided by the mission, vision, values, and objectives, the internal and external factors may be combined to develop and evaluate specific adaptive strategic

alternatives using a TOWS Matrix (threats, opportunities, weaknesses, and strengths)" (Ginter, 2000, p. 23). A TOWS matrix was produced for this study and was found to support related diversification from the Future Quadrant (see Appendix A). The future quadrant represents the best situation for the organization and allows TAMC to take advantage of its internal strengths (high quality of personnel, its excellent reputation, the quality of its equipment and technology), and the fact that this expansion can be done without incurring any capital investment. TAMC currently has a sufficient number of dialysis machines and the required space to treat up to 32 patients full time. By expanding and committing to the mission of chronic care, TAMC and the VA can benefit from maximizing production capacity and reap the benefits of economies of scale. All dialysis treatments at TAMC can be billed at approximately $100 less per treatment (see Appendix H). There is a current agreement between TAMC and VA that charges $350 per dialysis treatment plus the cost of EPO. The proposed Joint Venture estimates the costs to be $203 per treatment plus the costs of drugs and EPO. With these included, the bill is projected to total approximately $225 per treatment. The opportunities identified by the matrix are the recapture of Federal dollars from the private sector, Joint Venture recognition, and improved access for VA beneficiaries resulting in a stronger affiliation

between the organizations, and the potential congressional monetary rewards through demonstration project money. Congress is currently attempting to identify facilities that can lead the way in identifying money saving ventures that the DoD may replicate at other locations in the future.

Discussion

There was significant discussion between TAMC and the VA regarding the hiring of the additional nursing staff. The VA felt strongly about hiring the staff directly to work in the chronic dialysis facility in order to demonstrate their commitment to VA beneficiaries. They also wanted to ensure that the staff would always be dedicated to the patients and not subject to divert missions during high operational periods, military training exercises and/or military conflicts. Military medical facilities have many physicians, nurses, and staff that are on professional filler lists (PROFIS). These personnel are designated to fill specific positions of Corps and Division units that may be deployed to support a variety of operations. Once these PROFIS personnel are deployed, their positions may go unfilled for a period of months. A recent example of this was Operation Iraqi Freedom.

TAMC currently has a standing staff of two RNs and four LPNs assigned to the dialysis clinic. The clinic is located

within TAMC. TAMC's staff is therefore responsible for the daily operations, inspections, and liability of that facility. The Department of Nursing at TAMC believes that the additional staff should be hired by TAMC and that their costs should be included in the billable charges to VA. Should TAMC hire the additional staff, they would be civilian and not subject to any military operations or training distractions. VA's commitment to its beneficiaries will be demonstrated through coordination with TAMC to expand current capacity to accept and treat all Oahu VA eligible beneficiaries. VA could also demonstrate its commitment by dedicating more of their Nephrologist's time to the Chronic Dialysis Clinic.

Human resource management is critical to the success of any organization and "a fair and equitable compensation system may lead to higher levels of employee performance" (Fried and Johnson, 2002, p. 143). Should the VA hire the additional staff, it would create two separate compensation systems and benefits packages. It would also add an additional layer of administration, bureaucracy, and a separate performance appraisal format, both within the same clinic. This does not benefit either organization. Since there is already an established standing staff at TAMC, and since the acute dialysis mission must remain a high priority to TAMC, the management of the operations should remain in TAMC's control. With that in

mind, it would seem rational to encompass the entire expansion and staff acquisition through TAMC to maximize the benefit to both organizations.

What is paramount is that the two organizations are working together to collectively establish a facility where VA beneficiaries can receive a higher quality of care, that creates efficiencies, is accessible to veterans, and that will save hundreds of thousands of federal healthcare dollars annually. This is what Congress has mandated and this is what the Joint Venture Dialysis Project can achieve.

The two entities (TAMC and VA) had already agreed during their strategic planning session that they desire to nurture a culture with single unity of purpose in which all redundant systems would be joined to reduce duplicate administrative costs and recognize efficiencies for federal healthcare dollars. This project is an opportunity to capitalize on those goals.

Conclusion

TAMC and VA should open a Joint Venture Acute/Chronic Hemodialysis Clinic. Both organizations will gain from the cost savings and the beneficiaries will benefit from the access to quality care and robust staffing ratios. A Joint Venture agreement should be created stipulating a per treatment price of $203 with an annual review to encompass inflation of costs. The

agreement should also stipulate that the VA would be charged separately for the additional costs of EPO, other pharmaceuticals used during chronic treatments and that acute inpatient dialysis be billed based on diagnostic related group (DRG) rates. Inpatients that require chronic dialysis unrelated to their inpatient stay should continue to be billed separately for the dialysis treatment. The $203 rate per treatment exceeds the 90% CMAC rate, but through the reduced costs of pharmaceuticals and EPO, will result in an aggregate savings to VA.

The additional staff should be hired by TAMC in order to simplify management, ensure equitable pay and allowances, and to meet the intent of the strategic joint venture planning conducted by senior executives of TAMC and VA in September 2002. VA must sign a level of use agreement accepting financial responsibility for a designated level of use prior to hiring actions taking place. As the staff is hired and trained, TAMC must coordinate with VA to acquire the additional patients. VA must notify VA beneficiaries in advance to market the program and explain the improvements (quality, staffing, access) and at the established date set by TAMC, enroll the designated VA beneficiaries to receive their chronic dialysis treatments at TAMC.

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Figure Captions

Figure 1. TAMC Dialysis Clinic for FY 2002 vs cost projections for a Joint Venture Dialysis Clinic with 28 chronic patients. The Average cost per treatment with drugs was $369.82. Under the new, expanded model, TAMC can reduce the cost per treatment to $225.

Figure 2. Base nursing staff cost that must be maintained in order to support TAMC's acute dialysis mission ($334,605) plus the fixed operating costs for the dialysis clinic in FY2002 ($234,031). Comparison for the costs of the Joint Venture Dialysis clinic.

Figure 3. Cost of Quality. Depicts the relationship of costs as a result of quality measures built into the model (Finkler, 1999).

Appendix A

TOWS MATRIX

STRENGTHS

1 Quality of Personnel
2 Reputation of Care
3 Already Equipped
4 No need for Capital Investment
5 Tertiary Care Provider
6 Nephrologists on site

WEAKNESSES

1 More Expensive Care
2 Inefficient Models

OPPORTUNITIES

1 Chronic Dialysis Expansion
2 Recapture Federal $
3 Joint Venture Recognition
4 Congressional Selection as Pilot Site

THREATS

1 Fiscal Solvency
2 War / Resource shortages

FUTURE QUADRANT	INTERNAL FIX-IT QUADRANT
*********	
Related Diversification	Retrenchment
Vertical Integration	Enhancement
Market Development	Market Development
Product Development	Product Development
Penetration	Vertical Integration
**********	Related Diversification

EXTERNAL FIX-IT QUADRANT	SURVIVAL QUADRANT
Related Diversification	Unrelated Diversification
Unrelated Diversification	Divestiture
Market Development	Liquidation
Product Development	Harvesting
Enhancement	Retrenchment
Status Quo	

Appendix B

MERPS Costs for Hemodialysis FY 2002

Patients	**15.26**		**Patients**	**32**		
Annual Treatments	**156**	**(3 x a week) X 52 weeks**		**156**		
Total Treatments 2002	2381		New Model	4992		
			Option 1		Option 3	
Direct Costs	**MEPRS**		**Direct**			
Fixed	Direct	Civilian Personnel	$	125,867.00	$	125,867.00
	Direct	Military Personnel	$	170,547.00	$	170,547.00
		Sum		**$296,414.00**		**$296,414.00**
Variable	Direct	Other misc.	$	1,308.07	$	1,308.07
	Direct	Medical Supplies	$	75,313.00	$	75,313.00
	Direct	Other Supplies	$	18,311.84	$	18,311.84
	Direct	Pharmacy Supplies	$	13.68	$	13.68
		LAB Costs	$	39,725.60	$	39,725.60
		Nephrologist Time	$	14,902.34	$	14,902.34
		Sum	$	149,574.53	$	149,574.53
Per Treatment Variable Costs			**$**	**62.83**	**$**	**62.83**
Step Down Costs	**MEPRS**	**Description**	**All stepped**		**Filtered**	
	DAAA	Pharmacy	$	19,872.18		
0.449539222 Space Discrepancy	EDBA	Utilities	$	7,706.89	$	7,706.89
	EDCA	Maint. Real Property	$	5,221.18		
	EDKB	Base Ops Laundry	$	594.26		
	EHAA	Regular Laundry	$	1,575.45	$	1,575.45
	EEAA	Logistics	$	31,072.00		
	EFAA	Housekeeping	$	8,923.33	$	8,923.33
	EDAA	Facilities Mgmt	$	4,893.95		
	DGBA	Department of IMD	$	11,868.54		
	EBCD	Personnel Division	$	6,212.31		
	EBCB	Department of RM	$	3,117.71		
	EBDA	Department of Medicine	$	14,070.03		
	EGAA	Biomed Maint	$	40,681.02	$	40,681.02
		Depreciation of Equip	$	58,222.31	$	58,222.31
	Sum	Low	$	214,031.18	$	117,109.00
	**	High	$	234,031.18	$	137,109.00
		Impact per Procedure Costs				
		# of annual Procedures				
15.26 Patients	low	2381	$	89.91	$	49.19
	high	2381	$	98.31	$	57.60
32 Patients	low	4,992	$	42.87	$	23.46
	high	4,992	$	46.88	$	27.47
note:	**	Bio Med Maintenance annual contracts applicable to Dialysis Clinic				
result in the Higher Sum		$ 20,000				

Appendix C

3 Model Comparison Hemodialysis Costs

			Option 1	Option 2	Option 3

Joint Venture Dialysis Clinic

Patients	**15.26**		**Patients**		**32**
Annual Treatments	**156**	**(3 x a week) X 52 weeks**			**156**
Total Treatments 2002	2381		New Model	**60% Full Model**	4992
Direct Costs	**MEPRS**		**Direct**	**Direct**	**Direct**
Fixed	Direct	Civilian Personnel	$ 125,867.00	$ 125,867.00	$ 125,867.00
	Direct	Military Personnel	$ 170,547.00	$ 170,547.00	$ 170,547.00
		Sum	**$296,414.00**	**$ 296,414.00**	**$296,414.00**
Variable	Direct	Other misc.	$ 1,308.07	$ 1,308.07	$ 1,308.07
	Direct	Medical Supplies	$ 75,313.00	$ 75,313.00	$ 75,313.00
	Direct	Other Supplies	$ 18,311.84	$ 18,311.84	$ 18,311.84
	Direct	Pharmacy Supplies	$ 13.68	$ 13.68	$ 13.68
		Lab Costs	$ 39,725.60	$ 39,725.60	$ 39,725.60
		Nephrologist Time	$ 14,902.34	$ 14,902.34	$ 14,902.34
		Sum	$ 149,574.53	$ 149,574.53	$ 149,574.53
Per Treatment Variable Costs			**$ 62.83**	**$ 62.83**	**$ 62.83**
Step Down Costs	**MEPRS**	**Description**	**Some stepped**	**60 % Full**	**Filtered**
	DAAA	Pharmacy	$ 19,872.18	$ 19,872.18	
0.449539222	EDBA	Utilities	$ 7,706.89	$ 7,706.89	$ 7,706.89
Space	EDCA	Maint. Real Property	$ 5,221.18	$ 5,221.18	
Discrepancy	EDKB	Base Ops Laundry	$ 594.26	$ 594.26	
	EHAA	Regular Laundry	$ 1,575.45	$ 1,575.45	$ 1,575.45
	EEAA	Logistics	$ 31,072.00	$ 31,072.00	
	EFAA	Housekeeping	$ 8,923.33	$ 8,923.33	$ 8,923.33
	EDAA	Facilities Mgmt	$ 4,893.95	$ 4,893.95	
	DGBA	Department of IMD	$ 11,868.54	$ 11,868.54	
	EBCD	Personnel Division	$ 6,212.31	$ 6,212.31	
	EBCB	Department of RM	$ 3,117.71	$ 3,117.71	
	EBDA	Department of Medicine	$ 14,070.03	$ 14,070.03	
	EGAA	Biomed Maint	$ 40,681.02	$ 40,681.02	$ 40,681.02
Not Included Previously	EBAA	CMD		$ 3,226.27	
	EBAE	CSD		$1,192	
	EBBA	Special Staff		$ 7,208.15	
	EBBB	Quality Div.		$ 2,335.69	
	EBCC	Force Development		$ 1,082.23	
	EBCE	Hospital Treas		$ 760.88	
	EBFA	Ed & Training		$ 131.15	
	EBFC	CHE Training		$ 2,376.62	
	EBFE	Audio Visual		$ 851.59	
	EBFG	Staff Library		$ 1,219.72	
	EBFJ	DOHET		$ 1,192.49	
	EBFN	Nursing Courses		$ 2,374.71	
	EBGA	Disaster Planning		$ 16.28	
	EBGB	HSSA Disaster		$ 132.10	
	ELAA	TRICARE		$ 2,076.05	
	ELAB	Managed Care		$ 721.46	
	SUM		$ 155,808.86	$ 182,706.20	$ 58,886.69
	60%			$ 109,623.72	
	Plus	Depreciation of Equip	$ 58,222.31	$ 58,222.31	$ 58,222.31
		Low	$ 214,031.18	$ 167,846.03	$ 117,109.00
	Sum	High	$ 234,031.18	$ 187,846.03	$ 137,109.00
15.26 Patients	low	2381	$ 89.91	$ 70.51	$ 49.19
	high	2381	$ 98.31	$ 78.91	$ 57.60
32 Patients	low	4,992	$ 42.87	$ 33.62	$ 23.46
	high	4,992	**$ 46.88**	$ 37.63	**$ 27.47**
Note: Biomed Maintenance Contracts					
		$ 20,000	**Option 1**	**Option 2**	**Option 3**
Comparisons			**$ 46.88**	**$ 37.63**	**$ 27.47**

Appendix D
Dialysis Clinic Depreciation Straight Line Model

MMCN	Nomenclature___Generic	Life Expect.	Unit_Price	Depreciation per year Straight line	Date_In Service	Replacement
E4896	DEFIBRILLATOR/ECG MONITOR	8	$ 7,500.00	$ 937.50	9510	2003
A3235	ELECTROCARDIOGRAPH UNIT	8	$ 13,500.00	$ 1,687.50	9005	1998
C9734	MONITOR, VITAL SIGNS	8	$ 2,500.00	$ 312.50	8807	1996
E5045	MONITOR, VITAL SIGNS	7	$ 7,000.00	$ 1,000.00	9510	2002
E2416	PULSE OXIMETER	5	$ 3,282.23	$ 656.45	9312	1998
A9109	THERMOMETER, DIGITAL	5	$ 639.41	$ 127.88	9108	1996
A9110	THERMOMETER, DIGITAL	5	$ 639.41	$ 127.88	9108	1996
E4105	THERMOMETER, DIGITAL	5	$ 639.41	$ 127.88	9505	2000
E4111	THERMOMETER, DIGITAL	5	$ 639.41	$ 127.88	9505	2000
D1798	DIALYSIS MACHINE W/REVERSE OSMOSIS	5	$ 17,906.23	$ 3,581.25	0201	2007
D1799	DIALYSIS MACHINE W/REVERSE OSMOSIS	5	$ 17,906.23	$ 3,581.25	0201	2007
D1800	DIALYSIS MACHINE W/REVERSE OSMOSIS	5	$ 17,906.23	$ 3,581.25	0201	2007
D1801	DIALYSIS MACHINE W/REVERSE OSMOSIS	5	$ 17,906.23	$ 3,581.25	0201	2007
E4161	DIALYSIS MACHINE W/REVERSE OSMOSIS	5	$ 17,906.23	$ 3,581.25	9506	2000
E4163	DIALYSIS MACHINE W/REVERSE OSMOSIS	5	$ 17,906.23	$ 3,581.25	9506	2000
E4780	DIALYSIS MACHINE W/REVERSE OSMOSIS	5	$ 17,906.23	$ 3,581.25	9509	2000
E4781	DIALYSIS MACHINE W/REVERSE OSMOSIS	5	$ 17,906.23	$ 3,581.25	9509	2000
E4782	DIALYSIS MACHINE W/REVERSE OSMOSIS	5	$ 17,906.23	$ 3,581.25	9509	2000
E6109	DIALYSIS MACHINE W/REVERSE OSMOSIS	5	$ 17,906.23	$ 3,581.25	9603	2001
E6110	DIALYSIS MACHINE W/REVERSE OSMOSIS	5	$ 17,906.23	$ 3,581.25	9603	2001
A1697	PUMP, INFUSION	10	$ 2,356.00	$ 235.60	8906	1999
C8933	PUMP, INFUSION	10	$ 1,259.30	$ 125.93	8804	1998
E2155	SUCTION APPARATUS	10	$ 703.35	$ 70.34	9202	2002
E8096	PUMP, BLOOD MONITOR	8	$ 10,331.90	$ 1,291.49	9710	2005
D0759	SCANNER DIAGNOSTIC, BATTERY BACK-UP	8	$ 11,194.30	$ 1,399.29	0101	2009
E2264	CHAIR, DIALYSIS	10	$ 2,402.96	$ 240.30	9311	2003
E2265	CHAIR, DIALYSIS	10	$ 2,402.96	$ 240.30	9311	2003
E2266	CHAIR, DIALYSIS	10	$ 2,402.96	$ 240.30	9311	2003
E2268	CHAIR, DIALYSIS	10	$ 2,402.96	$ 240.30	9311	2003
C2392	STRETCHER, EMERGENCY	15	$ 4,168.90	$ 277.93	8508	2000
E0738	FUMEHOOD ASSY 120 VAC 49 X 89	10	$ 17,021.78	$ 1,702.18	9206	2002
A4722	REVERSE OSMOSIS WATER SYSTEM	8	$ 58,544.48	$ 7,318.06	9012	1998
H5810	SCALE PATIENT WEIGHING STAND-ON 350	5	$ 340.48	$ 68.10	0112	2006
A2231	SCALE PERSON WEIGHING W/ REMOVABLE	14	$ 1,911.33	$ 136.52	9009	2004
A2235	SCALE PERSON WEIGHING W/ REMOVABLE	14	$ 1,911.33	$ 136.52	9001	2004
	LEGEND	**Totals**	**$ 352,663.39**	**$ 58,222.31**		
$ 97,314.26	Good for at least 1 year			**Annually**		
$ 17,111.84	Needs replacement this FY					
$ 238,237.29	Should have been replaced					

Appendix E

Basic 32 Dialysis Patient Model

	Quantity	Cost	Value	Totals w/ 32 Option 1	Totals w/ 32 Option 2	Totals w/ 32 Option 3	Quantity 15.26	Value	Total w/ Option 2
Labor Costs									
RNs	**3**	$ 78,232.50	$ 234,697.50				2	$ 156,465.00	
LPNs	**7**	$ 44,535.00	$ 311,745.00				4	$ 178,140.00	
Total Labor				**$ 546,442.50**	**$ 546,442.50**	**$ 546,442.50**			**$ 334,605.00**
MEPRS Costs				**$ 234,031.18**	**$ 187,846.03**	**$ 137,109.00**			$ 234,031.18
Variable Costs									
32 **Patients**							15.26		
4,992 **Annual Treatments**							2,381		
$ 62.83 **Cost per Treatment**				**$ 313,655.63**	**$ 313,655.63**	**$ 313,655.63**	$ 62.83		**$ 149,574.53**
	Total costs for 32 Patients			**$ 1,094,129.31**	**$ 1,047,944.16**	**$ 997,207.13**	Total for 15.26 Patients		**$ 718,210.71**
	Annual Cost per Patient			**$ 34,191.54**	**$ 32,748.26**	**$ 31,162.72**			**$ 47,064.92**
	Cost per Procedure			**$ 219.18**	**$ 209.92**	**$ 199.76**			**$ 301.70**

Appendix F
Acute Care Dialysis Cost
TAMC

Acute Dialysis Treatments					
RN	GS-11	$ 78,233			
Weeks of work per year		48	less vacation		
cost per week		$ 1,630			
cost per hour		$ 41			
RN cost per Treatment		$ 204			
Acute Patients		3.26			
Hours per Treatment		5			
Weeks/Year		52			
Weekly Treatments		3			
Weekly cost per acute patient			$ 611.19		
Annual cost per acute patient			$ 31,781.95		
LABOR for 3.26 Acute Patients				$ 103,609.17	
Fixed Costs				$ 49,996.18	
Variable costs				$31,953.67	
Total Costs				**$ 185,559.01**	
Annual per patient				**$ 56,919.94**	
Monthly per patient				**$ 4,743.33**	
Cost per Procedure				**$ 364.87**	

Appendix G
Adjusted 32 Dialysis Patient Model

32 Patient Model	Quantity	Cost	Value	Option 1	60% Full Option 2	Reduced Step Option3
Labor Costs						
RNs	3	$ 78,232.50	$ 234,697.50			
LPNs	7	$ 44,535.00	$ 311,745.00			
Total Labor				**$ 546,442.50**	**$ 546,442.50**	**$ 546,442.50**
MEPRS Costs				$ 234,031.18	$ 187,846.03	$ 137,109.00
Total Fixed Costs				**$ 780,473.68**	**$ 734,288.53**	**$ 683,551.50**
Variable Costs						
Patients						
4,992	Annual Treatments					
$ 62.83	Cost per Treatment			$ 313,655.63	$ 313,655.63	$ 313,655.63
Total costs for 32 Patients				**$ 1,094,129.31**	**$ 1,047,944.16**	**$ 997,207.13**
Annual Cost per Patient				**$ 34,191.54**	**$ 32,748.26**	**$ 31,162.72**
Cost per Procedure				**$ 219.18**	**$ 209.92**	**$ 199.76**

Adjusted to remove Acute Patient costs from the model and then distribute the remaining costs against 28.74 Chronic Patients	Remove Acute Dialysis Case		Option 1	60% Full Option 2	Reduced Step Option3
		3.26 patients 508.56 annual Tmts	**28.74** Chronic patients 4483.44 annual Tmts		
Total Labor	minus	**$ 103,609.17**	$ 442,833.33	$ 442,833.33	$ 442,833.33
MEPRS Costs	minus	$ 49,996.18	$ 184,035.00	$ 137,849.86	$ 87,112.82
Total Fixed Costs			**626,868.33**	**580,683.19**	**529,946.16**
Variable Costs	minus	$31,953.67	**$ 281,701.96**	**$ 281,701.96**	**$ 281,701.96**
Total costs for 32 Patients		**$ 185,559.01**	**$ 908,570.30**	**862,385.15**	**811,648.12**
Annual Cost per Patient		$ 56,919.94	31,613.44	30,006.44	28,241.06
Cost per Procedure		$ 364.87	**$ 202.65**	**$ 192.35**	**$ 181.03**
	32.00	**Patients**			

Appendix H
VA vs. TAMC
Cost Comparison

	VA DOWNTOWN		TAMC			
	2002 DATA	VA Projected	2002 DATA	Model #1	60% Full /Model #2	Model #3
Patients	14	28.74	15.26	28.74	28.74	28.74
weeks	52	52	52	52	52	52
visits/week	3	3	3	3	3	3
Annual billing 2002	$ 331,587.84	$ 680,702.47	$ 829,219.13	$ 908,570.30	$ 862,385.15	811,648.12
Other Drug Costs/Year	$ 80,479.30	$ 165,212.51	$9,150	$ 17,232.03	$ 17,232.03	$ 17,232.03
Annual EPO	$ 94,969.98	$ 194,959.80	$ 42,000.00	$ 79,100.92	$ 79,100.92	$ 79,100.92
Average cost of Dialysis	$ 151.83	$ 151.83	$ 348.33	$ 202.65	$ 192.35	$ 181.03
Average cost of EPO/TMT	$ 43.48	$ 43.48	$ 17.64	$ 17.64	$ 17.64	$ 17.64
Cost per Treatment	$ 195.31	$ 195.31	$ 365.97	$ 220.29	$ 209.99	$ 198.68
Average other drug costs/tmt	$ 36.85	$ 36.85	$ 3.84	$ 3.84	$ 3.84	$ 3.84
Total Cost per VA tmt	**$ 232.16**	$ 232.16	$ 369.82	$ 224.14	**$ 213.84**	$ 202.52
	$ 507,037.12	$ 1,040,874.77	$ 880,368.77	$ 1,004,903.24	**$ 958,718.10**	$ 907,981.06
Lower Quality of Care costs	***Inpatient Care	$ 54,031.20		$ -	$ -	$ -
	Projected	**$1,094,905.97**		$ 1,004,903.24	**$ 958,718.10**	$ 907,981.06

TAMC Other Drug Costs FY2002	
Patient sample	12
Total Drug Costs	$7,195
Average variable cost per patient visit	**$ 3.84**

**

Projected Savings	Model #1	60% Full /Model #2	Model #3
1year	$ 90,002.73	$ 136,187.88	$ 186,924.91
5years	$ 450,013.67	$ 680,939.39	$ 934,624.56
10Years	$ 900,027.34	$ 1,361,878.77	$ 1,869,249.12

Appendix I
Nephrologist Costs
Hemodialysis Cost Study

Nephrologist Cost at TAMC						
32.00		**Number of Patients**				**15.26**
3		Visits a week				3
52		Weeks/Year				52
48		Work weeks	(4 week Vacation)			48
65		Hrs/week worked by Nephrologist				65
$ 150,000		Annual Salary				$ 150,000
3120	hrs	annual hours of work				3120
$ 48.08		Cost of Nephrologist per hour				$ 48.08
50	hrs	32 patients will consume this many hours of a Nephrologists time per month				
12.5	hrs	weekly time consumption				8.75
$ 600.96		weekly cost of Nephrologist				$ 420.67
$31,250.00		Nephrologist Cost for 52 Weeks				**$21,875.00**
$ 6.26		Variable cost per visit				**$ 9.19**

Appendix J

Pathology Costs Hemodialysis Cost Study

		Initiation of Dialysis Lab Tests				times/year	cost
CPT	**CPT**	**Lab Test**	**Cost**		Ind. Cost		
80061		**Lipid Panel**	$	28.19			
	83718	HDL Cholesterol		1	$ 14.56		
	82465	Cholesterol		1	$ 9.40		
	84478	Triglyceride		1	$ 10.24		
		LDL Cholesterol					
80076		**Hepatic Function Panel**	$	17.92			
	84460	Alanine Aminotransferase		1	$ 11.28		
	82040	Albumin		1	$ 8.82		
	84075	Alkaline Phosphatase		1	$ 10.34		
	84450	Aspartate Aminotrasferase		1	$ 10.81		
	82247	Bilirubin Total		1	$ 8.93		
	82248	Bilirubin Direct		1	$ 11.03		
	84155	Protein Total		1	$ 13.62		
85025		**CBC/Complete Blood Count**	$	13.83			
86706		**(HBsAb) Hepatitis B surface antibody**	$	23.49			
87340		**(HBsAg) Hepatitis B surface antibody**	$	21.14			
86803		**Hepatitis C AB Test (Anti-HCV)**	$	31.57			
83970		Parathyroid Hormone (PTH)	$	73.76			
82108		**Aluminum**	$	56.38			
86703		**HIV 1 & 2 single assay**	$	28.19			
Total			**$**	**304.47**		1	$ 304.47
		Monthly Lab Tests					
80069		**Hepatic Panel**	$	19.04			
	82947	Glucose			$ 9.40		
	82565	Creatine			$ 10.34		
	84520	Urea Nitrogen**(BUN) x1**	**$**	**9.63**	$ 9.63		
	84295	Sodium			$ 8.56		
	84132	Potassium			$ 9.40		
	82435	Chloride			$ 8.17		
	82374	Bicarbonate			$ 9.40		
	82310	Calcium			$ 10.62		
	82040	**Albumin**			**$ 8.82**		
	84100	Phosphorus			$ 9.40		
80162		**Digoxin**	$	25.60			
		Iron Panel	**$**	**78.52**			
	83540	Iron			$ 11.52		
	83550	Iron Binding Capacity			$ 15.55		

	84466	Transferrin		$ 24.67		
	82728	Ferritin		$ 26.78		
Total			**$ 132.79**		12	$ 1,593.48
		Quarterly Lab Tests				
87070		Aerobic Culture	$ 20.67			
83036		Hemoglobin A1C (HBA1C)	$ 20.67			
84520		**Recirculation Study**/Urea Nitrogen**(BUN) x 2**	$ 19.26	**$ 9.63**		
83970		Parathyroid Hormone (PTH)	$ 73.76			
82040		**Albumin**	**$ 8.82**			
Total			$ 143.18		4	$ 572.72
		Annual Lab Tests				
80061		**Lipid Panel**	$ 28.19			
86703		**HIV 1 & 2 single assay**	$ 28.19			
86706		**(HBsAb) Hepatitis B surface antibody**	$ 23.49			
87340		**(HBsAg) Hepatitis B surface antibody**	$ 21.14			
86803		**Hepatitis C AB Test (Anti-HCV)**	$ 31.57			
Total			$ 132.58		1	$ 132.58
Total Annual Lab Costs per patient						**$ 2,603.25**

***costs derived from CMAC rate reimbursement by CPT code

Appendix K
Net Present Value

2.10%	Rate	Period				
		1	2	3	4	5
Revenues						
	Chronic Patients	$ 1,004,903.24	$ 1,026,006.21	$ 1,047,552.34	$ 1,069,550.94	$ 1,092,011.51
	Acute Patients	$ 196,486.13	$ 200,612.34	$ 204,825.20	$ 209,126.53	$ 213,518.18
Total Revenue		$ 1,201,389.37	$ 1,226,618.54	$ 1,252,377.53	$ 1,278,677.46	$ 1,305,529.69
Expenses						
	Staff	$ 546,442.50	$ 557,917.79	$ 569,634.07	$ 581,596.38	$ 593,809.91
	MEPRS	$ 234,031.18	$ 238,945.83	$ 243,963.69	$ 249,086.93	$ 254,317.76
	Variable Costs	$ 313,655.63	$ 320,242.40	$ 326,967.49	$ 333,833.81	$ 340,844.32
	Epogen	$ 88,073.39	$ 89,922.94	$ 91,811.32	$ 93,739.36	$ 95,707.88
	Drugs	$ 19,186.67	$ 19,589.59	$ 20,000.97	$ 20,420.99	$ 20,849.83
Total Expenses		$ 1,201,389.37	$ 1,226,618.54	$ 1,252,377.53	$ 1,278,677.46	$ 1,305,529.69
Balance		$ -	$ -	$ -	$ -	$ -
PV		$0.00	$0.00	$0.00	$0.00	$0.00
NPV	$0.00					