Running head: INTERNAL MEDICINE CLINIC OPTIMIZATION

Graduate Management Project

Optimizing The Internal Medicine Clinic at Evans Army Community Hospital

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14. ABSTRACT
Although the Department of Defense (DoD) has established access to care standards for military health care organizations and their treatment facilities, many facilities may face challenges in meeting these standards. In fiscal year (FY) 2002, the Internal Medicine (IM) clinic at Evans Army Community Hospital, Fort Carson, Colorado, failed to meet access to care standards for routine appointments, and was only marginally successful in meeting standards for urgent appointments. Because of the inextricable link with optimization and access to care, this study is an initiative that utilizes business operational analysis in an effort to optimize operations and maximize access to care to the beneficiaries enrolled in the Internal Medicine clinic. The results of this study suggest that by reorganizing primary care managers (PCMs) empanelment, reassessing the full time equivalent (FTE) for each PCM, improving the provider to support staff ratios, and improving providers template management, access to care will be substantially improved for enrolled beneficiaries.

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Abstract

Although the Department of Defense (DoD) has established access to care standards for military health care organizations and their treatment facilities, many facilities may face challenges in meeting these standards. In fiscal year (FY) 2002, the Internal Medicine (IM) clinic at Evans Army Community Hospital, Fort Carson, Colorado, failed to meet access to care standards for routine appointments, and was only marginally successful in meeting standards for urgent appointments. Because of the inextricable link with optimization and access to care, this study is an initiative that utilizes business operational analysis in an effort to optimize operations and maximize access to care to the beneficiaries enrolled in the Internal Medicine clinic. The results of this study suggest that by reorganizing primary care managers' (PCMs) empanelment, reassessing the full time equivalent (FTE) for each PCM, improving the provider to support staff ratios, and improving providers' template management, access to care will be substantially improved for enrolled beneficiaries.

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Introduction

Conditions which prompted the study

Although the Department of Defense (DoD) has established access to care standards for military health care organizations and their treatment facilities, many facilities may face challenges in meeting these standards. In fiscal year (FY) 2002, the Internal Medicine (IM) clinic at Evans Army Community Hospital, Fort Carson, Colorado failed to meet access to care standards for routine appointments, and was only marginally successful in meeting standards for urgent appointments. In the period between March and August 2002, the IM clinic met appointment access standards only 65% of the time for acute appointments and 21% of the time for routine appointments.

Changes in TRICARE to extend coverage to the over the age of 65 population have resulted in the creation of TRICARE Senior Prime. TRICARE Senior Prime was a managed care demonstration program designed to better serve the medical needs of military retirees, dependents, and survivors who are age 65 and over. The evolution of this managed care demonstration program and continuing efforts to accommodate TRICARE Senior Prime age-ins (beneficiaries turning age 65 between January 1 and December 31, 2002) has critically impacted the capacity of each primary care manager (PCM) in the IM clinic. The demonstration program ended

in December 2001 and beneficiaries participating in the program were enrolled in the new program called TRICARE Plus.[1] Currently, over 2,300 of these beneficiaries are enrolled in the IM clinic: an enrollment figure that represents approximately 32% of the total enrolled population in the IM clinic.

Historically, the age 65 and over population presents more complex medical conditions, which require more direct care time from the PCM in almost every visit. Consequently, this population is affecting the ability of the IM clinic to meet access to care standards due to prolonged patient visits, which in turn limits the number of appointments available to other beneficiaries.

In February 2001, EACH received approval for an optimization initiative for its primary care clinics. The hospital received a total of $1.3 million for primary care optimization (PCO) projects. The February 2001 PCO initiative only addressed shortages in providers and support staff of all three primary care clinics (Internal Medicine, Family Practice, Pediatrics), the Emergency Department and the Primary Acute Care

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[1] TRICARE Plus is a primary care enrollment program open to beneficiaries who are eligible for care in military treatment facilities (MTFs).

Clinic (PACC). Because of the interdependence between these organizational elements, a more detailed analysis of each primary care clinic is necessary in order to develop a plan to effectively allocate $1.3 million on primary care optimization initiatives. The Internal Medicine clinic is the first clinic identified for this initiative.

Statement of the problem

The Internal Medicine clinic primary care optimization plan became a top command priority as a result of the decrease in access and the saturated appointment system. In FY 2002, the IM clinic at EACH failed to meet access to care standards for routine appointments, and was only marginally successful in meeting standards for urgent appointments. The Medical Command's (MEDCOM) access to care goal is 90% or higher compliance for urgent and routine appointments. In FY 2002, the IM clinic failed to meet access to care standards 11 out of 12 months for urgent appointments. During the same period, the compliance rates in FY 2002 by month for urgent appointments ranged from 66% to 90%, and the IM clinic failed to meet access standards for routine appointments. Compliance rates for routine appointments in FY 2002 by month ranged from 32% to 82%. In February 2001, EACH submitted a Primary Care Optimization (PCO) Business Case Analysis (BCA) to the U.S. Army Medical Command

(MEDCOM) as an initiative to improve support staff ratios within the primary care clinics (Appendix). The business case analysis is an economic analysis used to evaluate the costs and benefits of at least one alternative to the status quo. The PCO BCA only addressed human resource shortages for improving access to primary care services. A more deliberate and encompassing optimization plan is needed to effectively address the IM clinic's access to care issues.

A personnel shortage in the IM clinic is also critically affecting the clinic's capability to sustain access to healthcare services. By losing one military internist without an authorized replacement, the IM clinic continues to saturate its appointment schedules and place an unrealistic workload burden on the current staff. The hiring of internists from the civilian market has been a challenging task because of availability and preferences of internists: a shortage of internists exists in the labor market and many internists are unwilling to work in the military health system. In fact, several hiring actions for internists have been open for nearly 12 months.

Resource sharing agreements have been pursued to relieve provider shortages in many specialties. Although use of these providers improves the productive efficiency of the IM clinic,

regulations constrain the ability of the clinic to provide care for all members of the enrolled population. Under TRICARE For Life provider reimbursement systems, resource sharing providers are paid from hospital operating funds, but are restricted from seeing patients age 65 and over, which leaves this population with access difficulties.

In October 2000, President Clinton signed the FY 2001 National Defense Authorization Act (NDAA), Public Law 106-398. This law brought many new initiatives to the TRICARE program including TRICARE For Life benefits for the age 65 and over population. TRICARE For Life is structured like a Medicare supplement and acts as a secondary payer to Medicare claims. This newly implemented program has significantly increased the demand for appointments by the 65 and older population by approximately 40% since TRICARE Senior Prime took effect in January 2002. Before January 2002, the 65 and older TRICARE beneficiaries were enrolled in TRICARE Senior Prime as part of the demonstration program.

Partially because of TRICARE for life, the total number of enrolled beneficiaries in the IM clinic jumped from 4,987 in 2000 to 7,094 in 2001. The total number of enrolled patients age 65 and over has steadily increased at an average rate of 20 to 23 patients per month. The increase in enrollment resulted in an

increase in appointment waiting times. Currently, a patient who wishes to see his or her PCM for a routine appointment has to wait approximately eight to ten days.

The lack of provider availability, insufficient supply of appointments, and provider and support staff shortages, are contributing factors affecting the ability of the IM clinic to meet access to care standards. This project will examine, identify, and make recommendations to improve beneficiary access in the IM clinic.

Literature Review

The U.S. Army Medical Command (MEDCOM) and the TRICARE Management Activity (TMA) are concerned about the increasing costs of healthcare services being provided by the Managed Care Support Contract (MCSC). In an attempt to save costs, MEDCOM and TMA have ordered medical treatment facilities (MTFs) to optimize their operations and work more efficiently in order to minimize costly Bid Price Adjustments (BPA; Ardner, 2001).[2]

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[2] The BPA is what the government pays the MCSC for care provided through the network. The BPA serves as a reconciliation process between the MCSC and the Department of Defense (DoD) where premium payments are continually updated to reflect changes in the number of beneficiaries as well as increased utilization of MCSC's local network.

However, the trend over the last few years is that more care is being provided by the MCSCs, and at a higher cost than originally projected (Pace, 2001). TMA and MEDCOM assume that healthcare delivered to patients in the MTF is more cost effective than MCSC care provided in the network (Ardner, 2001). In an effort to assist MTFs in working more efficiently, maximizing productivity, and reducing costs, the U.S. Army Surgeon General has mandated the development of the Balanced Score Card (BSC) management system and the use of the Business Case Analysis (BCA) approach to making business decisions by all MEDCOM MTFs (Harben, 2001). Use of the BSC strategically and operationally guides the AMEDD. Further, the BSC serves as a means of fulfilling certain requirements established by the Government Performance and Results Act (GPRA) of 1993, particularly those related to performance analysis and development of organizational strategies.

Evans Army Community Hospital's primary care optimization initiative supports the BSC initiatives. Optimization, as defined in the AMEDD's Population Health Clinical Optimization Guide, is providing quality medical care by maximizing the right resources at the right time. The PCO initiative categorically meets the Fort Carson MEDDAC commander's BSC initiatives which

include (a) access improvement, (b) alignment of resources with changing mission and population, (c) planning for demand changes, (d) maximization of total (MCSC and direct) system efficiency, (e) delivering quality compassionate care, (f) instilling a passion for eliminating wasted time and resources, (g) improvement of MTF business process, and (h) effective training for medical personnel. The implementation of the PCO initiative will improve the efficiency of healthcare services provided in the primary care arena and particularly the IM clinic (COL S. Goodrich, personal communication September 18, 2002).

In December 2001, the Assistant Secretary of Defense for Health Affairs, Dr. Thomas Carrato, set the foundation for the military health system optimization plan. This foundation is outlined in the first edition of the Population Health Improvement (PHI) Plan and Guide. The PHI is the balancing of awareness, education, prevention and intervention activities required to improve the health of a specified population and serves as a cornerstone of the DoD's MHS Optimization Plan. At the MTF level, PHI uses seven key process elements, which include (a) identification of the population, (b) forecasting demand, (c) managing demand, (d) managing capacity, (e) providing evidence-based primary, secondary, and tertiary

prevention, f) community outreach, and (g) analysis of performance and health status (DoD TRICARE Management Activity, 2001). The PHI's seven key process elements are principles that will guide the methodology employed in this research.

The PHI Plan and Guide presents a model for use in predicting optimum enrollment capacity. The PHI's historical data illustrate that a military provider spends an average of 10% of his or her time on readiness-related tasks and spends 90% on delivering direct patient care. Under the current guidance published on the DoD PHI Plan and Guide, the goal is to enroll 1,300 to 1,500 beneficiaries per PCM (Helmers, 2001).

An enrollment capacity model developed by Helmers (2001) suggests that the PHI model for enrollment capacity may not fully consider real-world variables that affect the enrollee per provider goal. The model developed through Helmers' analysis used medium sized MTFs and considered the actual costs of military training, readiness, residency training, and indirect patient care. This model suggests that military providers devote more than 10% to readiness related activities (Helmers).

Aside from readiness considerations, an MTF's capacity to enroll its beneficiaries is affected by the following factors: (a) the number of primary care managers (PCM), (b) PCM's availability to see patients, (c) patient demand for visits, and

(d) the productivity of providers. Additionally, these factors are also influenced by the availability of support staff, space for exam rooms, and leadership influence that encourages access improvements (Bailey, 2000).

Access to health services is also affected by the size of the calling population. As the size of the population increases, the demand for health care services will also increase and present monumental challenges in meeting access standards if supply side factors do not accordingly adjust to changes in demand.

Military health care organizations face challenges in rapidly adjusting to changes in demand, and are particularly challenged to procure an adequate number and an appropriate mix of medical staff to meet primary care demands for the peacetime beneficiary population (McGraw, Barthel, & Arrington, 2000). Medical treatment facilities have a unique requirement, unlike civilian healthcare facilities, of preparing providers and support staff to meet a go-to-war mission: these readiness considerations are critical in comparisons of private sector and DoD productivity.

Productivity is also affected by the incentive structures inherent in DoD compensation schemes. Military and civilian physicians and the majority of support personnel within the MHS

are salaried employees. Davis (1999) showed that healthcare organizations that are trying to increase productivity and patient volume find that *employed* physicians lack sufficient financial incentives and managerial skills to meet desired productivity levels. Some of these healthcare organizations have overhauled their physician compensation programs and introduced effective incentives in order to increase physician productivity (Davis, 1999).

In addition to establishing productivity-based incentives, organizations have undertaken a number of initiatives to improve productivity and efficiency. Tselikis (1996) and Zucker (1997) propose several areas to focus effort to improving productivity:

1. Template management is the key to building a schedule that is realistic and corresponds to what the provider is actually doing. This includes appointment types and time allocated to each appointment.

2. Analysis of proper support staff and physician utilization is critical when developing daily tasks and procedures. Physicians and support staff must perform tasks in the least expensive way, and delegate tasks appropriately. In other words, a clinic must know the roles and capabilities of the clinical support staff to delegate tasks accordingly.

3. Proper staff mix is essential to maximize staff

utilization. Having the right personnel for the right job and hiring physician assistants and nurse practitioners to perform services that previously were conducted by physicians will effectively reduce the need for hiring more physicians.

4. Maximize the utilization of technology to improve processes and increase time allotted for patient-provider interaction.

Murray and Berwick (2003) suggest that accessibility and continuity of care are two key goals in any primary care practice. Many primary care practices struggle to achieve these goals mainly because of a seemingly overwhelming demand for patient visits. Waits and delays in health care access have been a challenge for many years and are partially due to overfilled appointment schedules that require access reforms. Before implementing an access reform in a primary care practice, the clinic must have an understanding of the size of their patient population, level of patient demand for visits, and number of appointment slots available. These data can be calculated using measures such as demand, capacity, panel size, and future open capacity (Murray & Berwick).

Provider type may also affect accessibility and access to care. Studies by Bertakis et al. (1998) show that internal medicine primary care physicians, as compared with family

practice physicians, spend more time examining and instructing patients, demonstrate a greater tendency to order laboratory tests, and refer more patients to specialty care. These studies also suggest that patients assigned to the internal medicine clinic make more appointments, have a higher no-show appointment rate, and visit the emergency room and acute care clinic more frequently (Bertakis et al.). As the organization strives to understand differences in productivity across primary care clinics, these observations have significance for EACH as it attempts to improve productive efficiency in the IM clinic.

Understanding the relationship between provider types, productivity, and population demographics is critical for making decisions about what services to provide, how to provide them, and for whom the services are offered. Many studies focusing on these types of relationship have used quantitative techniques, such as linear programming, to inform the decision making process. Rothstein (1973) studied methods of allocating hospital manpower in housekeeping operations. Starting with an agreed set of desirable objectives, he developed a linear programming model for the scheduling of hospital manpower with the goal of maximizing the number of weekly assignments with the minimum work force available. Similarly, Feldstein (1962) developed a linear programming model in the pursuit of a desirable mix of

patients or cases to be treated. The model maximized the weighted sum of the number of cases in each of nine medical specialties, subject to constraints on such resources as bed days, doctors and nurses. Dowling (1970) used a linear programming model to determine the mix and volume of patients that maximizes the total number of patients treated in a given time period, subject to constraints on departmental capacities and minimum patient requirements (Dowling, 1970). Smith, Over, Hansen, Golladay, and Davenport (1973) also used linear programming as the optimization method of choice in studies of optimal health manpower staffing. George, Fox, and Canvin (1983) used a linear programming model to identify the optimal throughput of patients, taking into account their urgency, diagnosis and resource use, and the availability of resources. These studies, although few in number, demonstrate the elegance and parsimonious nature of this quantitative technique. The use of linear programming is particularly relevant to an examination of optimization in the MHS.

Purpose

The purpose of this project is to determine why the Internal Medicine clinic is not meeting access to care standards. This study will also identify ways to improve beneficiary access in the IM clinic by determining the maximum

number of patients that can be served given the constraints facing the clinic. Additionally, this study will seek to determine methods and procedures to improve clinical business practices in an attempt to increase beneficiary access.

Methods and Procedures

The methods and procedures utilized in this study include gathering secondary data from a wide range of information systems established in the MHS, providing descriptive statistics that include central tendencies and ratios, and using a linear programming model. Two major sections are used in the organization of my analysis. First, under the supply of care section, I include (a) the Innova Group Analysis, (b) estimating the supply of care, (c) support staff and exam rooms to provider ratios, (d) linear programming model, and (e) provider productivity analysis. Under the demand for care section, I include (a) enrollment capacity, (b) estimating beneficiary visits, (c) estimating demand for care, (d) appointment wait time analysis, and (e) access to care metrics.

The Innova Group Analysis and supply of care estimates are used to forecast staffing requirements in the IM clinic and to show if the IM clinic is postured to meet the demand of its beneficiaries with the staff at hand. Next, the support staff and exam room ratios will be presented. These ratios will

indicate if the IM clinic has the appropriate number of support personnel to assist providers in meeting the demand and if sufficient exam rooms exist to serve its beneficiaries. A linear programming model is introduced next. This model provides a method of determining the optimal number of providers required for a given population under existing operational constraints. Finally, provider productivity based on relative value units (RVUs) in the IM clinic will be presented.

The enrollment capacity of the IM clinic will be analyzed by utilizing the MEDCOM Enrollment Capacity Model. The enrollment capacity analysis will show if the IM clinic is under or over its beneficiary capacity. Additionally, analyses of the demand for care and estimated beneficiary visits per year will show how frequent the population enrolled in the IM clinic uses its services. Finally, appointment wait time data and access to care metric from the Composite Healthcare System (CHCS) and the Patient Administration System and Biostatistics Activity (PASBA) will be supplied. Wait time and access to care data will provide an indication of how the IM clinic is meeting the needs of its beneficiaries in a timely manner.

Supply of Care

Innova Consulting Group Analysis

In May 2000, the Innova Consulting Group conducted an analysis through collaboration and work sessions with senior staff from each department. The group made recommendations related to operational changes and future scenarios based on anticipated changes in population, workload and staffing forecasts. Staffing forecasts were developed based upon expected levels of provider productivity. The Innova Consulting Group evaluated provider productivity given (a) available clinic hours per day, (b) available clinic days per week, (c) available procedure days per week, (d) average visits per hour, and (e) average provider visits per year.

Estimated Supply of Care

The estimated supply of care, or throughput, is based on number of appointments,[3] in a period of one year, available per PCM FTE in the IM clinic.

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[3] Only urgent, routine, follow-up, and initial visit types of appointments were considered in this study.

Support Staff and Exam Room Ratios

MEDCOM calculates clinical support staff ratios based on three-to-one support staff per provider. The three-to-one factor is then multiplied by the FTE factor per provider that will result in the *target* support staff required per provider. This figure is then multiplied by the average annual cost per support staff employee ($47,500) that results in the amount of dollars required to plus up the staff to a 3:1 ratio.

The goal of exam room per PCM ratio is calculated based on two-to-one exam rooms per provider. The total number of exam rooms per PCM FTE is then divided by the total number of FTE PCMs available (MEDCOM, 2002).

Linear Programming Model

Linear programming is one of several quantitative techniques that organizations can use to determine optimal values to inform decision making and solve management problems (Austin & Boxerman, 1995). The use of this model provides a method of determining the optimal number of providers required for a given population under existing operational constraints. In the development of this model for the current project, I assumed linearity in the constraints presented and developed in the linear programming appointment model (LPAM).

Provider Productivity

The use of a resource-based relative value scale (RBRVS) allows procedures and costs to be identified on a common or relative basis, using relative value units (RVUs; Shackelford, 1999). Relative value units can be used to develop, evaluate, and allocate resource requirements for a particular organization (Burger, 2001). Work RVUs, in particular, represent the amount of time, effort, and intensity required by physicians to perform services and procedures. The RVU also includes practice and malpractice expense. As utilized in the MHS setting, RVUs do not include practice and malpractice expenses (Glass, 2002).

Demand for Care

Enrollment Capacity

The capacity calculation is operationally defined as the number of patients to be empanelled/enrolled by full time equivalent (FTE) providers (MEDCOM, 2002). FTE is defined as an adjusted fraction of the time an employee, working in a primary care setting, is actually available to provide care for beneficiaries (LTC G. Patrin, personal communication, September 10, 2002). The enrollment capacity calculation assumes that a provider has three clinical support staff and two exam rooms available. The model also assumes that providers are available

for 52 weeks for direct patient care, work 37.5 hours per week, and conducts three patient visits per hour.

Enrollment capacity hinges upon (a) the average active duty intern population assigned to the MTF, (b) the current TRICARE Prime enrolled population, and (c) the number of non-TRICARE Prime users (beneficiaries that have used the MTF three times or more) (MEDCOM, 2002). Summing the total number of beneficiaries in each category provides total required empanelled population. Also, the internal medicine clinic uses appointment templates as a means for developing the number of weekly appointments. These templates are based on the number and type of providers (physician, registered nurse or physician assistant) and their availability to provide beneficiary care (MEDCOM, 2002).

Estimated Demand for Care and Beneficiary Visits

The demand for health care depends upon age, sex, and health status of the enrolled population (MEDCOM, 2002). To capture demand, many organizations use utilization of services as a proxy for this construct. Within the MHS, demand is based on four outpatient visits per year per beneficiary as calculated in the Enrollment Capacity Plan (ECP) developed by MEDCOM. Beneficiary visit estimates are critical in determining the overall demand for care in the IM clinic. These estimates will

determine how many times the enrolled population seeks care in the IM clinic.

Appointment Wait Time and Access to Care Metric

In and effort to improve access to care for beneficiaries, TRICARE has developed methodologies to standardize the appointment system. The objectives of appointment standardization include (a) improvement of beneficiary customer service, (b) simplification of the appointing and referral process, and (c) increased involvement of the managed care support contractor (MCSC) in the appointing process (DoD TRICARE Management Activity, 2001). The access standards for appointments established by TRICARE are as follows: 24 hours for acute appointments, 7 days for routine appointments, and 28 days for wellness and specialty appointments. One method of measuring access is to calculate the number and percentage of appointments scheduled within the standards detailed above. This method will facilitate an analysis of how well a facility is meeting access standards by capturing those appointments outside the standard. The goal is to meet appointment standards with at least 90% compliance of total appointments in a specific category (PASBA, 2003).

After collecting and analyzing the data, I will develop a list of business initiatives to address problems and improve the

status quo by optimizing operations and improving productivity within the IM clinic.

Data Sources

The Composite Healthcare System (CHCS) was used to determine the total number of patient visits in the IM clinic. Active duty and TRICARE Prime data were extracted from the CHCS database and examined to determine the total number of TRICARE Prime patient visits. The MHS Management Analysis and Reporting Tool (M2) database and the Patient Administration System and Biostatistics Activity (PASBA) were queried to obtain the number of TRICARE Prime enrolled beneficiaries and the access to care compliance in the IM clinic. The data collection period was from October 1, 2001 through September 30, 2002. The data used in this study were aggregated and did not have personal identifiers attached; therefore, obtaining consent from individuals was unnecessary.

Validity is the ability of a research instrument to measure what it is supposed to measure. Reliability is the ability of a research instrument to measure what is designed to measure in a consistent manner (Cooper & Schindler, 2001). The validity of the construct known as optimization is based on logical validity. By selecting appropriate data elements that measure beneficiary access, a reasonable connection can be made between

the data and the construct of optimization.

Minimization of systematic errors in data retrieval and processing substantially increases reliability. The MHS has instituted a comprehensive program of identification, monitoring and improvement strategies for the full range of data quality issues. This data quality (DQ) program ensures accurate and timely data capture in all MTFs through the utilization of a DQ managers and DQ committees to audit and troubleshoot any DQ issues (PASBA, 2003). Additionally, clerical and administrative personnel that use the CHCS and other information systems receive periodic formal and ongoing informal training on data entry and other aspects of information management, which reduces the potential for errors. The MHS DQ programs and committees and the implementation of periodic data entry training to minimize random or unstable errors, make data collecting systems in the MHS reliable.

Results

Supply of Care

Innova Consulting Group Results

The results of the Innova Consulting Group analysis are presented in Table 1.

Table 1

Internal Medicine Clinic Average Provider Availability in FY 2002

	Weeks/Year	Hours/Year
Annual Compensated Time	52	2,080
Reason for Absence		
Annual Leave	-4	-160
Sick Leave	-2	-80
Holidays	-2	-80
Continuing Medical Ed.	-1	-40
Military Training	-1	-40
Training holidays	-0.8	-32
TOTAL AVAILABLE TIME	41.2	1,648

Table 1 shows an estimated total of 1,648 clinic hours for military providers. The Innova Consulting Group did not allocate military training (40 hours) for civilian providers. This resulted in 1,688 available hours per year for civilian providers. One additional and critical factor that impacts the IM clinic is the daily duties that internists must perform as hospitalists. A hospitalist is defined as an internist performing on call duties for inpatient care. These duties include regular cardiac stress tests, nuclear medicine stress tests, pre-operation EKG evaluations, and urgent inpatient consults. The IM clinic has an internist performing inpatient hospitalist duties seven days per week. A hospitalist internist’s duty schedule sample is presented in Figure 1.

While performing these duties, these internists are not available in the clinic to see patients on an outpatient basis; therefore, these duties reduce the overall FTE provider availability in the clinic by at least one full FTE.

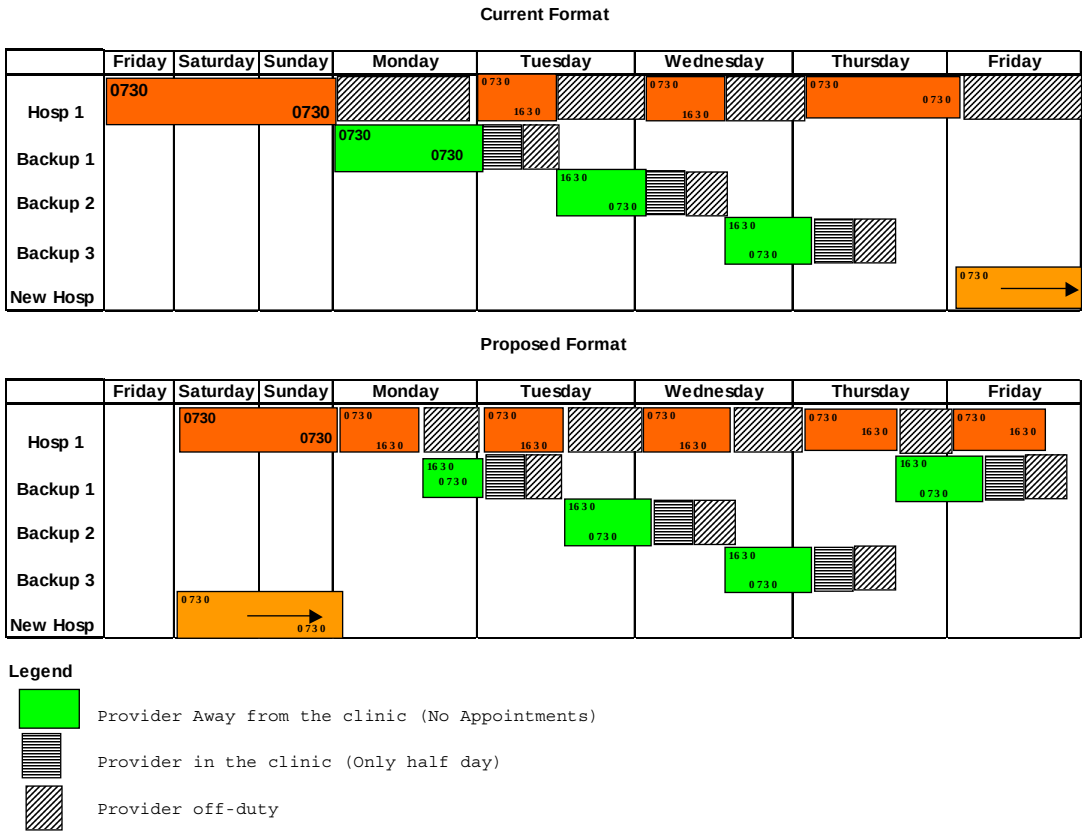

Figure 1. Current and proposed hospitalist schedule for the Internal Medicine Clinic.

Estimated Supply of Care

The estimated supply of care, or throughput, is based on number of appointments, in a period of one year, available per PCM FTE in the IM clinic. At the end of FY 2002, the IM clinic

had 9.7 FTE permanently assigned PCMs. Two of these PCMs were contract providers hired through the MCSC resource sharing agreement. Currently, the IM clinic builds its PCMs' templates, minus two resource share providers, with appointment slots of 30 minutes each. For providers working under resource sharing agreements, templates are built based on 20-minute appointments. Utilizing the Innova Consulting Group model in Table 1, which accurately depicts the current status of IM personnel (LTC L. Tucker, personal communication, January 15, 2003) results in an estimated total of 36,419 appointments available per year in the IM clinic (see formula below).

Total appointments per year:

[(Military Provider FTE) X (1,648 available hours) X (# of appointments/hour)]+ [(Contract Provider FTE) X (1,720 available hours) X (# of appointments/hr)] + [(GS civilian provider FTE) X (1,720 available hours) X (# of appointments/hour)]

Support Staff and Exam Room Ratios

Additional factors that affect the ability of a PCM to see patients at a given period are the support staff and exam room to provider ratios. The DoD's Population Health Improvement

Guide suggests an optimal support staff ratio of 3.0 to 3.5 per full time equivalent PCM. The Automated Staff Assessment Model (ASAM) III recommends a staff support ratio of 2.8 per PCM FTE based on budgetary constrains. Table 2 presents ratios of support staff to provider FTEs, as well as current provider and support staff FTEs, for personnel assigned to the IM clinic, family practice, and pediatrics. Table 2 shows that the IM clinic has a support staff to provider ratio of 1.6 which is the highest of all three primary care clinics, but still lower than the MEDCOM's target ratio of 3:1.

Table 2

Primary Care Clinics Average Support Staff to Provider Ratios in FY 2002

Clinic	Provider FTE	Support Staff	Ratio
IM	9.7	15.0	1.6
Family Practice	12.0	24.0	1.5
Pediatrics	8.5	10.5	1.3

Exam rooms to provider ratios directly affect the total number of beneficiaries that can be seen by their PCMs in an hour. Table 3 provides the ratios of all three primary care clinics, which are physically collocated. The collocation of exam rooms is important not only because of sub-organizational interdependence, but also because these rooms may be shared or

otherwise utilized in order to increase productive efficiency of the clinics.

Table 3

Primary Care Clinics Average Exam Room to Provider Ratios in FY 2002

Clinic	Provider FTE	Exam Rooms	Ratio
IM	9.7	19	2.0
Family Practice	18.0	38	2.1
Pediatrics	8.5	15	1.8

Linear Programming Appointment Model

In order to examine the relationship between numbers of providers, type of appointments, and appointment utilization, I developed a simple linear programming appointment model (LPAM) and employed graphical and algebraic techniques to determine the maximum number of appointments that the clinic could provide given organizational constraints. Results of this model are depicted in Figure 2. The LPAM arrived at the following equation:

Maximize: $X_1 + X_2 = P$ (Appointments)

$.5X_1 + .3X_2 \leq 77.6$ (Labor hours constraints)

$.5X_1 + .3X_2 \leq 77.6$ (Exam room constraints)

$.5X_1 + .3X_2 \leq 41.1$ (Support staff manpower hours constraint)

$X_2 \leq 48$ (Contract provider hours constraint)

$X_1 \geq 0$, $X_2 \geq 0$ (Nonnegativity constraints)

Where P represents the total number of appointments available per day, X_1 represents the number of 30-minute appointments available per day, and X_2 represents the number of 20-minute appointments available per day. X_1 and X_2 are the decision variables. The labor and exam room hour constraints are calculated by multiplying the total provider FTE in the IM clinic (9.7) times the hours in a normal work day (8.0). The support staff manpower hours constraint is calculated by multiplying the total provider FTE in the IM clinic (9.7) times the hours in a normal work day (8.0), times the support staff to provider ratio (1.6), then divided by the optimal support staff to provider ratio (3.0). Lastly, the contract provider constraint is calculated by multiplying the total contract provider FTE (2.0) times the hours in a normal work day (8.0) times total 20-minute appointments available per hour (3.0). A visual inspection of the LPAM shows that the optimal solution is a corner solution that equates to 48 20-minute appointments and 53 30-minute appointments per clinic day. The provider and exam room hour constraints do not affect the ability of the IM clinic to see more patients. However, the support staff constraint prevents the IM clinic from increasing appointments without the hiring of more support staff.

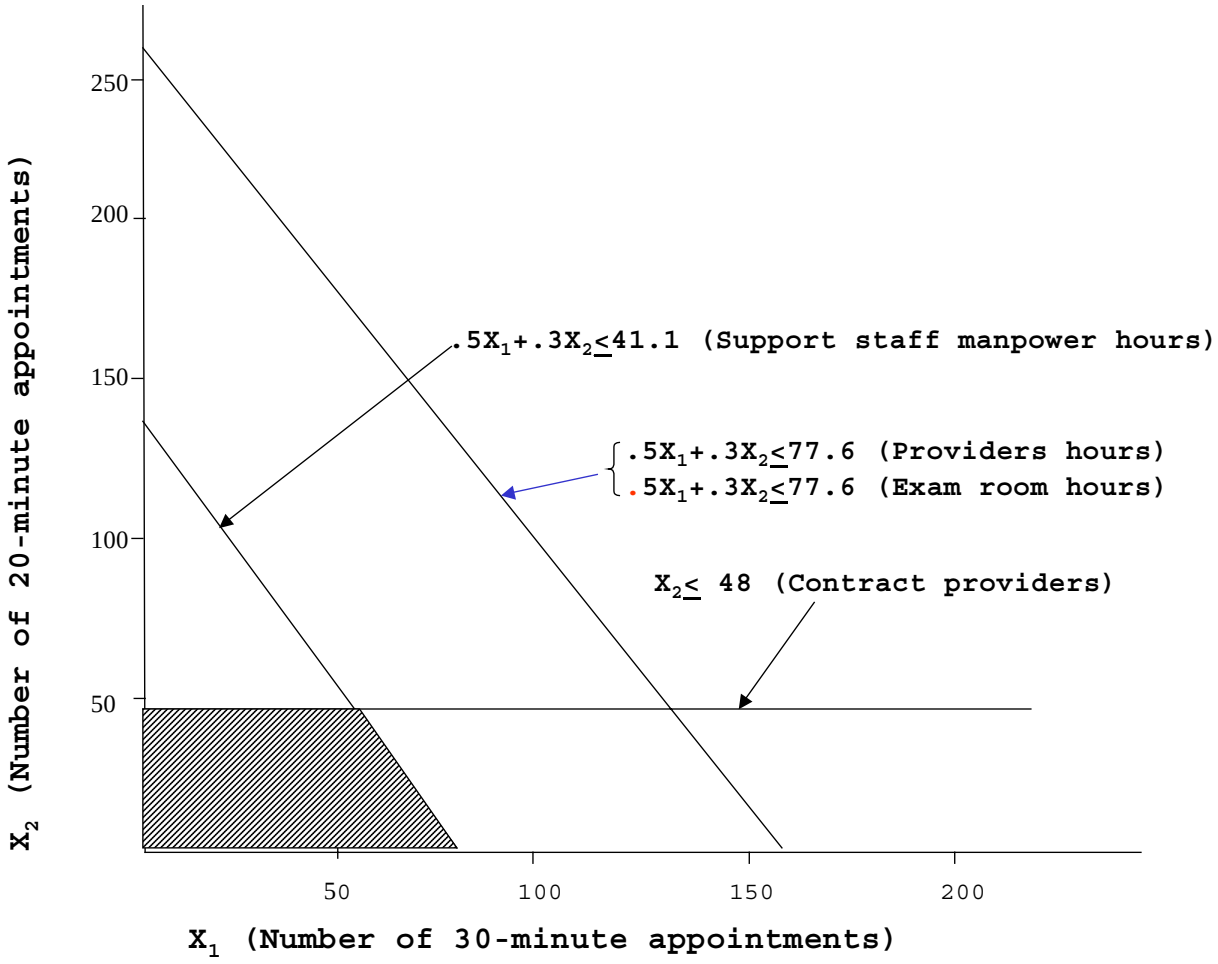

Figure 2. Graphic representation of support staff manpower constraint per clinic day ($.5X_1 + .3X_2 \leq 41.1$), GS/civilian and military provider hours constraint per clinic day ($.5X_1 + .3X_2 \leq 77.6$), Exam room hours constraint per clinic day ($.5X_1 + .3X_2 \leq 77.6$), contract provider hours constraint per clinic day ($X_2 \leq 48$) as they impact the supply of 30-minute (X_1) and 20-minute (X_2) appointments in the IM Clinic.

Provider Productivity

Lastly, I looked at provider productivity for the IM clinic based on relative value units (RVUs). Relative value units provide a measurement of clinic productivity based on the acuity of patients. Table 4 provides a comparison of RVUs between the IM clinic, family practice, and pediatrics clinics for FY 2002. When compared with other primary care clinics at EACH, the IM clinic produced the lowest encounter adjusted RVUs based on the acuity of its patients.

Table 4

Primary Care Clinics Average Relative Value Units in FY 2002

Clinic	Encounters	RVU	Mean RVU/Encounter
Internal Med	49,920	28,011	0.56
Family Pract.	73,600	48,136	0.65
Pediatrics	15,272	11,392	0.75

Another comparison is presented in Table 5 between EACH and other MTFs with similar size and enrolled population. Data presented in this table pertains only to IM clinic at each facility for FY 2002. Once again, the IM clinic at EACH showed the lowest mean RVU when compared with other facilities of similar size.

Table 5

MTF Average Relative Value Units Comparison in FY 2002

MTF	Encounters	RVU	Mean RVU/Encounter
Ft. Carson	49,920	28,011	0.56
Ft. Benning	23,833	14,024	0.59
Ft. Jackson	18,557	13,893	0.75
Ft. Belvoir	63,928	37,007	0.58

Demand for Care

MEDCOM Enrollment Capacity Model

The purpose of the MEDCOM enrollment capacity model is to accurately forecast the enrollment capacity for primary care providers and their support staff. If applied, this model will help guide the primary care clinics into doing the best they can with available resources against predetermined quality standards, business processes, and customer satisfaction. According to the MEDCOM enrollment capacity model, the appropriate panel size for a PCM working full time 1.0 FTE is 1,178 beneficiaries. This panel size is further reduced based on a 2.5 factor assigned to each beneficiary over the age of 65. The over the age of 65 beneficiaries number is multiplied by the 2.5 factor to compensate for the additional time and health care requirements this population demands from the IM clinic. Table 6 depicts the results for the IM clinic's PCMs by beneficiary

category and shows *inflated* numbers for the over the age of 65 population.

Table 6

IM Clinic Average Enrollment Capacity by Beneficiary Category in FY 2002

PCM	FTE	Panel Size	AD	ADD	NADD	>65[a]	Total	Percent
1 Chief (Mil)	0.5	589	4	54	258	523	839	142
2 Military	0.2	236	2	29	71	73	175	74
3	0.5	589	4	38	427	920	1,389	236
4	0.5	589	0	83	213	218	514	87
5 Military	1.0	1,178	1	100	366	695	1,162	99
6 Military	1.0	1,178	2	85	348	665	1,100	93
7	1.0	1,178	0	42	315	790	1,147	97
8	1.0	1,178	1	76	354	668	1,099	93
9	1.0	1,178	1	67	309	793	1,170	99
10	1.0	1,178	0	38	315	593	946	80
11(Contract)	1.0	1,178	0	97	362	0	459	39
12(Contract)	1.0	1,178	0	62	250	0	312	26
TOTAL	9.7	11,427	15	771	3,588	5,938	10,312	90

Note. AD = active duty; ADD = active duty dependent; NADD = non-active duty dependent; >65 = over the age of 65.

[a]The >65 figures include a 2.5 factor per beneficiary.

Table 6 shows that several providers are under capacity and two providers are over capacity based on their panel size allocations. In addition to the enrollment capacity table for the IM clinic, enrollment data for the other two primary care clinics are presented in Table 7 for comparison purposes. Table 7 clearly shows that the IM clinic has a larger population of over the age of 65 than the family practice clinic.

Table 7

Primary Care Clinics Average Enrollment Capacity by Beneficiary Category in FY 2002

Clinic	FTE	Proposed Capacity	AD	ADD	NADD	>65	Total	Percent
Family P.	16.5	19,490	1,059	13,641	4,598	1,030	20,330	104
IM	9.7	11,427	15	771	3,588	5,938	10,312	90
PEDS	4.5	5,301	0	5,671	782	0	6,453	122

Note. AD = active duty; ADD = active duty dependent; NADD = non-active duty dependent; >65 = over the age of 65.

Estimated Beneficiary Visits per Year

Another key factor to consider in analyzing clinic capacity is to determine how many times beneficiaries seek care in the IM clinic. Table 8 provides the total number of visits by beneficiary category, the mean number of per person visits by category, and the percentage of visits attributed to a particular category. A tremendous amount of variation exists across categories. The NADD and the over the age of 65 beneficiaries took 87.6% of all visits in FY 2002. By contrast, the active duty population and their dependents took only 12.4% of the visits in FY 2002.

Table 8

Average Beneficiary Visits in Internal Medicine Clinic FY 2002 by Category

Category	Visits	Mean	Percent
AD	1,184	2.4	2.6
ADD	4,536	4.1	9.8
NADD	21,409	5.6	46.4
>65	19,013	7.9	41.2
Total	46,142	6.3	100.0

Note. AD = active duty; ADD = active duty dependent; NADD = non-active duty dependent; >65 = over the age of 65.

Estimated Demand for Care

The estimate of demand for care shows the total number of beneficiaries assigned to each PCM, by category who are enrolled in the IM clinic. This data, in conjunction with the total visits by beneficiary category, provide another approach in helping determine the capacity of the clinic and prioritize future enrollments. The IM clinic has a total enrolled population of 10,312 beneficiaries with a weighted average visit per beneficiary of 6.3 visits. This total includes active duty (AD), active duty dependent (ADD), non-active duty dependent (NADD), and the over the age of 65 (with 2.5 factor) beneficiaries categories.

Appointment Wait Time

Template Management

At the present time, the IM clinic manages its provider's templates by utilizing four types of appointments: acute, routine, established (follow-up), and PCM (initial visit). The length of each appointment is set at 30 minutes each regardless of beneficiary age or type of appointment. Resource share providers, on the other hand, have 20-minute appointments across the board regardless of beneficiary age (minus age 65 and over beneficiary), and type of appointment. At any given day, the IM clinic has a maximum of 182 appointments available and a minimum of 150 appointments based on the number of 30-minute or 20-minute appointments available per day.[4] This availability of appointments is also based on the available FTE per provider when all providers may be present for duty at one time or unavailable based on their assigned FTE factor on an 8-hour working day.

[4] These figures do not consider the negative effect of support staff shortages.

Access to Care Metric

The access to care metric determines the responsiveness (compliance) of the clinic's patient care in terms of whether or not urgent and routine appointments meet TRICARE access standards. Table 9 depicts access to care data collected on EACH's IM clinic from the U.S. Army Patient Administration Systems and Biostatistics Activity (PASBA) in FY 2002. PASBA utilizes CHCS data and extracts the following formula to assess a specific clinic against access standards:

(Total # of Appointments within standard X 100) /

(Total # of Appointments Requested)

Table 9

FY 2002 Access to Care Metric Results

	Urgent Appointments			Routine Appointments		
Month	Total	Compliant	Percent	Total	Compliant	Percent
OCT	325	232	71	621	276	44
NOV	353	232	66	645	250	39
DEC	328	224	68	562	247	44
JAN	420	287	68	792	365	46
FEB	371	256	69	600	225	38
MAR	368	242	66	455	146	32
APR	412	293	71	556	190	34
MAY	288	260	90	262	137	52
JUN	281	231	82	90	70	78
JUL	257	193	75	124	102	82
AUG	329	257	78	162	133	82
SEP	277	247	89	193	120	62

Table 9 shows that the IM clinic failed to meet access to care standards for urgent appointments 11 out of 12 months in FY 2002. It also shows the clinic failed to meet access to care standards for routine appointments every month in FY 2002.

Discussion

One of the greatest constraints in improving the IM clinic's ability to meet access to care standards is the lack of effective provider's time and template management. The IM clinic is not at its maximum capacity for enrolling beneficiaries. Applying the MEDCOM enrollment capacity model, the IM clinic currently sits at 90% of its total beneficiary capacity. Some providers have greater than optimal enrollment panel sizes, and others have less than optimal numbers. For example, one provider maintains a panel size that is 136% over ideal capacity. Prior to this research, provider capacity in IM, and in all the primary care clinics, has not been established and scientifically analyzed in order to effectively optimize providers' beneficiaries enrollment panels.

Also, prior to this research, accurately allocating FTEs to each provider assigned to the IM clinic has never been accomplished. The personnel division at EACH calculates FTE allocations for civilian employees but it does not reflect the actual FTE once a provider is permanently assigned to the clinic. This FTE assessment is accomplished in a combined effort between the clinic chief, careline chief, clinical operations division, and the personnel division based on the actual duties

and responsibilities of each provider. Once this process is accomplished, an accurate FTE allocation could be determined to reflect actual provider availability.

One of the clinic's providers is a full time civilian employed provider who, because of his additional responsibilities of running other educational programs for the facility, is unable to be 1.0 FTE for the IM clinic. Therefore, beneficiaries assigned to this provider have difficulty in seeing him on a timely basis due to *over-empanelment.*

Availability is also affected by the hospitalist duty schedule, which two providers are absent from the clinic two days every week. Regardless if a hospitalist internist is called in the night before to perform on call duties, he or she takes one half day off (Tuesday through Thursday) the following day. Also, the hospitalist internist on call on weekends and Thursdays takes the following day off regardless if he or she was called in the day prior. Additionally, three days of every week 1.5 provider FTEs are absent from the clinic.

Another finding in the enrollment capacity analysis is the under empanelment of two resource share contract providers. These contract providers are 1.0 FTE for the clinic but their current panel sizes do not reflect their ability to accept a larger population of beneficiaries. Currently, these two contract providers have only 39% and 26% of their proposed empanelment capacity.

The estimated beneficiary visits per year are also

important considerations when optimizing the IM clinic. The older population, over the age of 65, presents some unique challenges. This population visits the facility more often than any other beneficiary category seeking healthcare for chronic illnesses (LTC L. Tucker, personal communication, January 15, 2003). The population over the age of 65 had a mean of 7.9 visits per beneficiary in this category in FY 2002. Current estimates for military visits rates to primary care range from four to five visits per enrollee per year (DoD TRICARE Management Activity, 2001). This finding becomes critical as the IM clinic attempts to adjust its 30-minute appointment templates to accommodate longer than usual appointments for this population and to estimate the demand for care.

In order to achieve high levels of effectiveness in improving access to care, the IM clinic must manage its health resources and have an accurate account of the enrolled population. At present time, the IM clinic has 10,312 beneficiaries distributed in different categories. Is this population of beneficiaries above or below the capacity of the IM clinic? According to the MEDCOM enrollment capacity model, the IM clinic is under capacity by 10%. This conclusion is not enough to answer the research question of meeting access standards. Therefore, I looked into other factors that may affect the ability of the IM clinic in meeting access to care standards.

Considering the Innova results of estimating provider

availability, in tandem with the total beneficiary visits in FY 2002, one can identify a shortage of available appointments. By estimating 32,403 appointments, based on 9.7 provider FTEs in FY 2002, against 46,142 total visits in FY 2002, there is a deficit of 13,739 appointments. Consequently, beneficiaries had to wait longer than the established access to care standards in FY 2002 to see their PCMs.

In the support staff to provider ratio results, the IM clinic still lacks sufficient support staff. In accordance with the MEDCOM guidance of optimal support staff to provider ratio of 2.8 to 1, the IM clinic needs to increase its support staff to a level closer to the suggested 2.8 per provider FTE. At present time, the IM clinic has a 1.6 support staff to provider FTE ratio. This will positively impact the ability of providers to dedicate more time to patient care rather than spend time performing administrative duties that support staff is designed to accomplish.

Analyzing the exam room to provider FTE ratios, the IM clinic fares well with the MEDCOM guidance of 2.0 to 1 ratio. The rest of the primary care clinics are also at or just below the optimal ratio.

Providers' templates are perhaps the factor that has the most profound effect on the clinic's throughput. All military and government service (GS) providers have their appointments set for 30 minutes each regardless of the type of patient. This decision was made at the start of FY 2002 when TRICARE senior

prime took effect to provide adequate provider-to-patient encounter time to the over the age of 65 beneficiaries. Certainly, this approach benefits this population, which represents more than 50% of the total enrolled population in the IM clinic, and also takes approximately 41% of all visits. However, it should not exclude the rest of the enrolled population, which does not need the extended 30-minute appointments (LTC(P) L. Tucker, personal communication, January 15, 2003). By contrast, contract providers have 20-minute appointments, but they are restricted from seeing over the age of 65 beneficiaries.

A linear programming model was utilized to offer an alternative to managing appointments in the IM clinic based on total appointment, support staff, exam room, and provider constraints. This model shows how support staff and exam rooms constraints and their impact on the appointment supply in the clinic. Based on this model, the optimal point is depicted by the intersection of the support staff and contract provider constraint lines. This optimal point results in 48 20-minute and 53 30-minute appointments may be booked every clinic day without affecting efficiency. The model also shows that before the clinic's leadership decides to expand or increase appointments, the hiring of support staff must be accomplished. If continued expansion and increase of appointments become necessary after hiring additional support staff, space availability will have to be addressed to maintain efficiency. This model will prove

helpful when maximizing and properly managing provider templates by assigning a balanced number of 20 and 30-minute appointments.

The access to care metric plays an important role in the optimization process of the IM clinic. This metric is tracked, at the corporate level, through the U.S. Army Patient Administration Systems and Biostatistics Activity (PASBA). This provides a snapshot by month of the MTF's access to care compliance status of urgent and routine appointments. During FY 2002, EACH's IM clinic met access to care standard only 8% of the time, under the urgent appointment tracking statistics.

Relative value units (RVU) provide a quantitative means for tracking provider productivity. By tracking RVUs against encounters between providers and patients through appropriate coding, organizations can identify the intensity of the encounter and demonstrate that providers are working at a higher skill level. The overall IM clinic's RVUs were compared with the rest of the primary careline. The comparison shows that despite the high number of over the age of 65 population enrolled in the IM clinic, RVUs per encounter were the lowest of all three primary care clinics. Proceeding one step further, a comparison between EACH's IM clinic and other three MTFs' IM clinics of similar size and enrolled population shows EACH's IM clinic has the lowest RVUs. These results counter the argument that the IM clinic's providers are working more intensely with more complex patients.

Recommendations

Based on the results of this study and analysis of the data, an immediate provider empanelment reorganization of the Internal Medicine clinic would provide the momentum for improving productive efficiency of the clinic. This action alone will have a direct and immediate positive effect in meeting access to care standards. This reorganization will provide beneficiaries enrolled in the IM clinic the opportunity to access their assigned PCMs more expeditiously, which will decrease average appointment-waiting times.

Additionally, the organization may consider the following recommendations to improve the healthcare delivery operations of the Internal Medicine clinic:

1. The IM clinic should determine the extent to which assigned providers are available to provide direct patient care (i.e., determine actual FTEs). This assessment should include an analysis of all duties and responsibilities of the providers to determine if these duties outweigh the need to provide better access to the beneficiaries. Before this study, an assessment of providers' FTEs had not been accomplished. Previously, all providers were assigned as a full (1.0) FTE. The lack of accurate FTE assessments encourages TRICARE enrollment personnel to erroneously assign beneficiaries to providers who are not available on a full time basis.

2. I recommend that providers and organizational leadership conduct an analysis of all beneficiaries' records in order to

match beneficiaries and providers. Matching on the basis of patient characteristics and provider capabilities may reduce the assignment disparity that exists between and within departments. As shown in the results, a large disparity exists between some providers who are not considered 1.0 FTE but have *overpopulated* panels. Also, a larger disparity between contract providers and regular staff providers' panels exists. Since contract providers are restricted from seeing over the age of 65 patients due to federal reimbursement conflicts between Medicare and MTFs, it is appropriate to distribute and assign the younger beneficiary population to these providers. As shown in the results, both contract providers remain at 39% and 26%, respectively, of their proposed panel size capacity.

3. I also recommend a redistribution of the over the age of 65 population between the IM clinic and the family practice clinic. Currently the IM clinic holds approximately 85% of the over the age of 65 population enrolled at EACH. The less serious and younger patients from this population should be *exchanged* with other beneficiaries from the family practice clinic. This redistribution should bring a better balance of this population between the clinics, which would provide more time and flexibility to the IM clinic in managing providers' templates and length of appointments.

4. The organization should review and revise its hospitalist duty schedule. This process should include the clinic chief, the careline chief, and the deputy commander for clinical services.

The IM clinic loses approximately 62 provider hours per week due to the performance of these duties. This obviously equates to less appointments available at the clinic. This proposed schedule allows for provider recovery time with only 46 provider hours away from the clinic. Additionally, a better compensatory time tracking mechanism should be in place to not only protect the staff providers from fatigue, but maximize provider availability if actual on-call duties were performed. If hospitalist providers on call are not called in, these providers should be present for duty the following day. This rule should be applied to all providers regardless if they are military or government service civilians. This researcher also recommends periodic audits of the clinic's compensatory time practices.

5. A support staff to provider ratio analysis should be further investigated. Support staff resources remain at critical levels across all primary care clinics. The IM clinic's support staff to provider ratio is at 1.6. This figure is well below the recommended ratio from the PHI guide and MEDCOM. Time and effort should be dedicated to invest and hire more support staff to optimize patient-to-provider time. Contrary to perceptions held by the clinic's leadership, the results of this study suggest that enrollment capacity, panel redistribution, duty schedules and template management also play a tremendous role in limiting access to care. The lack of providers, a factor that initially drove the primary care optimization business case analysis that was submitted to MEDCOM in 2001, is neither the key nor sole

factor that limits productive efficiency in the IM clinic.

6. A revision of provider templates should be accomplished at the earliest opportunity. Provider templates are a critical factor in scheduling patients and optimizing the productivity of providers. Currently, templates are built based on 30-minute appointments for acute and routine encounters regardless of the age of the patient. The premise for this extended length of appointment times is to compensate for the medical needs of the older population, which consume more time per encounter when compared with other age groups. This researcher recommends the establishment of a mixture 20 and 30-minute appointments during an optimization transition period. Once the above recommendations have been executed, then all appointments should be for 20 minutes. If more time is needed for first time beneficiary appointments, then two 20-minute appointments should be combined to accommodate an appropriate assessment of the patient by the provider.

7. The proper utilization and standardized training of the support staff should be examined more closely. Tasks performed by the support staff are not standardized across the clinic. Some administrative tasks that should be performed by the support staff are being accomplished by the providers. Therefore, providers spend their valuable time performing administrative tasks that otherwise should have been accomplished by the support staff. A further examination of support staff training and utilization may be helpful in

improving efficiency.

8. Providers' productivity, based on RVUs, should be part of the performance improvement objectives in the IM clinic. The utilization of RVU metrics are highly dependent on coding accuracy and are the primary driver for reimbursement. I expected that RVUs in the IM clinic would be higher than RVUs reported in the other primary care clinics because of the high number of older beneficiaries enrolled in the IM clinic. However, the IM clinic at EACH had the lowest RVUs when compared with other primary care clinics within EACH. Compared with other similarly sized internal medicine clinics, the IM clinic at EACH also reported the lowest number of RVUs per encounter. These findings merit a review of the provider coding accuracy and further examination of coding personnel procedures.

9. The IM clinic's leadership should conduct an analysis on the hours of operations of the clinic. Prior to this study, the IM clinic started daily operations at 0830. This was due to avoid conflict of time between their daily morning report meetings and the start of their first appointment. Starting operations at 0800 would leave ample time to proceed with their 20-minute morning meeting reports and would ultimately result in an increase of approximately 130 appointments per month.

Conclusion

The Internal Medicine clinic has the opportunity to increase its efficiency and productivity in its operations without incurring a tremendous budgetary burden to the

organization. The key to this optimization initiative rests, not on the hiring of more providers as previously thought, but on the proper analysis of actual providers' FTE figures and proper distribution of beneficiaries among the providers and between the family practice and the IM clinics. Another critical factor, which greatly influences the IM clinic's ability to increase its throughput, is the reduction of its appointment lengths from 30 minutes to 20 minutes. If the above recommendations are fully implemented, the IM clinic will be postured for success in its effort to increase productivity and meet access to care standards.

The IM clinic chief has already implemented some of the above recommendations to optimize clinical operations. He has changed the clinic's hours of operations, has initiated beneficiaries redistributions among all providers, and reassessed providers' FTE factors. These changes, coupled with an ongoing awareness of the factors that limit productive efficiency and access to care, will undoubtedly improve the ability of the IM clinic to meet TRICARE's access to care standards. The methods and results presented in this study may be further utilized to optimize the operations of the other primary care clinics at EACH and increase the access to care of our beneficiaries.

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Appendix

Primary Care Optimization Business Case Analysis

POM UFR BCA-FCPLOPTIMIZATION

Unfinanced Requirement (UFR) Description / Return on Investment

UFR Submitter/POC	MAJ Jim Kelley
Commercial Phone	719-526-7473
Activity / Major Subordinate Cmd	CSD
Date Submitted	05-Feb-01

Executive Summary

Evans Army Community Hospital (EACH) currently supports 45,732 TRICARE Prime enrollees. Of the 45,732, EACH directly suppor 30,682 of this population. The difference of 15,050 represents the Active Duty soldiers at Fort Carson less the MEDDAC/DENTAC soldie The figure of 30,682 is approximately 7,000 higher than what the *MTF Primary Care Capcity Estimator* projects as our current enrollment capacity based on our number of available staff. It is also important to note that we only included those providers in step two of the Estim Model that could be used as PCMs here in the hospital. In a few instances, we had providers who either worked in the Prime Acute Care Clinic (after hours clinic) or strictly in the TMCs; therefore, we did not include these providers because they are not used as PCMs for ser members or other beneficiaries receiving care in the hospital. Instead, these providers along with the FORSCOM medical personnel act a PCMs for the FORSCOM soldiers.

The evolution of TRICARE Senior Prime and continuing efforts to accomodate TRICARE Senior Prime age-ins remains the primary foc our PCM capactiy initiatives. As of May 1, 2000, EACH reached its open enrollment target of 2000 enrollees and has also accepted an additional 389 age-ins into the TSP program. We expect the age-in trend to continue and this coupled with the TRICARE For Life prograr gives us reason to believe more beneficiaries will be seeking to access care in the MTF. Approximately 75% of all enrollees at Fort Cars active duty and active duty family members. The remaining 25% is comprised of Retirees and their family members as well as the TSP population. It is this population that we are most concerned with because this is where we expect increases in the future. There are exa 998 of our eligible beneficiaries enrolled to the network as Civilian Prime. As of this time, we have been able to enroll all eligible beneficia excluding the 659 on the TSP enrollment waiting list. Additionally, there are approximately 1,000 Medicare eligible beneficiaries awaiting opportunity to receive an updated TSP enrollment application and to secure enrollment status. In our proposal and both the alternatives, continue to provide care for the MTF enrolled beneficiaries and hope to gain resources to recapture a portion of the 998 currently receiving in the network. It would also be possible given the additional support staff to recapture most if not all of the awaiting TSP population. Significant cost savings occur when recapturing network workload. For example, the average annual claims cost for Civilian Prime is $2,7 while the average annual claims cost for MTF Prime enrollees is only $292. If we bring the civilian Prime enrolles back into the MTF, the average annual claim cost for the combined population would be $346.

Perhaps even more important than network recapture would be the opportunity to maximize the care provided in the Primary Care Line clinics. Obtaining a ratio of 2.8 support staff per provider would most definitely be a step in the right direction. We must offer our providers best possible clinical environment in order to meet TRICARE access standards. Our proposal and two alternatives follow:

Proposal Primary Care Line (PCL) Model requires additional support staff to increase the efficiency of the PCL. The total cost to hire t required 2.8 support staff per provider is $1,055,300 annually. This option gives us the opportunity to empanel an additional 9,000 equivale lives or 2,250 patients given the current mix of available beneficiaries. The total cost savings to be realized through this option is $936,21

Unfinanced Requirement Authority / Driver

The Commander, EACH, received a tasking from BG Perugini indicating we have an opportunity to get real dollars for PCM Primary Care support staff and exam rooms. The CG wants to include this issue as supplemental funding requirements into LTG Peake's testimony to Congress scheduled on 28 Feb 01. In order to meet this requirement, we sumit the following BCA for your review.

Additional Impacting Factors

Proposal: The average annual claims cost for Civilian Prime is $2,707 while the average annual claims cost for MTF Prime enrollees is only $292. If we bring the civilian Prime enrolles back into the MTF, the average annual claims cost for the combined population would be $346.

Unfunded Requirements for FY 2003				
Investment	**Current Funding?**			**Proposal**
Labor (as costed from "Manpower" worksheet)	$ -			$ 1,055,300
Leases/Rents	$ -			$ -
Contracts	$ -			$ -
Supplies	$ -			$ 380,700
Equipment (Procurement)	$ -			]
Equipment (Non-Procurement)	$ -			$ -
New Construction	$ -			$ -
Renovation	$ -			$ -
Maintenance	$ -			$ -
Utilities	$ -			$ -
Misc	$ -			$ -
	$ -		**Additional Cost**	**$ 1,436,000**
Revenue	$ -			$ -
Cost Recapture	$ -			$ 2,372,213
Cost Avoidance	$ -			$ -
	$ -		**Savings**	**$ 2,372,213**
Total Cost/Savings	**$ -**		**Total Cost/Savings**	**$ 936,213**

Unfunded Requirements for FY 2004				
Investment	**Current Funding?**			**Proposal**
Labor (as costed from "Manpower" worksheet)	$ -			$ 1,055,300
Leases/Rents	$ -			$ -
Contracts	$ -			$ -
Supplies	$ -			$ 380,700
Equipment (Procurement)	$ -			]
Equipment (Non-Procurement)	$ -			$ -
New Contruction	$ -			$ -
Renovation	$ -			$ -
Maintenance	$ -			$ -
Utilities	$ -			$ -
Misc	$ -			$ -
	$ -		**Additional Cost**	**$ 1,436,000**
Revenue	$ -			$ -
Cost Recapture	$ -			$ 2,372,213

Manpower & Staffing Requirements for FY 2003

	Current On-Hand		Proposal		Alternative 1	
	Staff	FTE	Staff	FTE	Staff	FTE
Military Staffing						
Clinical Officers	-	-				
Clinical Enlisted	-	-	-	-	-	-
Admin Officers	-	-	-	-	-	-
Admin Enlisted	-	-	-	-	-	-
Borrowed Military Providers	-	-	-	-	-	-
	-	-	-	-	-	-
Civilian Staffing						
Clinical GS	-	-	27.00	27.00	24.00	24.00
Clinical Contract	-	-		-		
Resource Sharing Clinical	-	-	-	-	-	-
Admin GS	-	-	5.50	5.50	6.00	6.00
Admin Contract	-	-		-		
Resource Support Admin	-	-				
Volunteers	-	-	-	-	-	-
	-	-	32.50	32.50	30.00	30.00
Total	-	-	32.50	32.50	30.00	30.00

Note: Please list, by type of personnel (military, DAC, contractor, etc) and grade all personnel requirements, by year, at the bottom of this w
costed and added to the "Pg 3 Funding & Savings Data" as an investment cost.

Manpower & Staffing Requirements for FY 2004

	Current On-Hand		Proposal		Alternative 1	
	Staff	FTE	Staff	FTE	Staff	FTE
Military Staffing						
Clinical Officers	-	-				
Clinical Enlisted	-	-	-	-	-	-
Admin Officers	-	-	-	-	-	-
Admin Enlisted	-	-	-	-	-	-
Borrowed	-	-	-	-	-	-
	-	-	-	-	-	-
Civilian Staffing						
Clinical GS	-	-	27.00	27.00	24.00	24.00
Clinical Contract	-	-		-		
Resource Sharing Clinical	-	-	-	-	-	-
Admin GS	-	-	5.50	5.50	6.00	6.00

Matrix Questions

After you have completed the narrative and data portions of the POM UFR BCA please address the following questions. For the cost sectio use the *Total Cost* number from the Funding and Savings Data sheet. All the other questions should be scored from 1 to 5. The status quo considered your baseline. The proposal and alternatives scoring should reflect the level of change you expect with the implementation of the Please be prepared to support your score.

1 = Poor
2 = Fair
3 = Average
4 = Good
5 = Excellent

	Status Quo	Proposal	Alternative 1	Alternative 2
Cost to Implement Initiative		$ 1,055,300	$ 945,000	$ 630,000
Access for Prime	3	5	4	3
Customer service	3	5	4	3
Customer satisfaction	4	5	4	4
Efficiency and effectiveness	3	5	4	4
Employee satisfaction	3	5	4	4
Overall health care quality	4	5	5	4
Overall Impact	**3**	**5**	**4**	**4**

		PRIMARY OPTION COSTS AND PERSONNEL			
Family Practice		**Internal Medicine**		**Pediatrics**	
Enrollees: 17,468		**Enrollees: 7,240**		**Enrollees: 5,974**	
1 BMM Providers		0 BMM Providers		0 BMM Providers	
13 MIL Providers		4 MIL Providers		4 MIL Providers	
1 RS Providers		2 RS Providers		0 RS Providers	
6 Civilian Providers		4 Civilian Providers		1 Civilian Providers	
14.3 TOTAL FTEs		**8.7 TOTAL FTEs**		**3.4 TOTAL FTEs**	
SUPPORT STAFF		**SUPPORT STAFF**		**SUPPORT STAFF**	
8 CNAs		2 CNAs		2.5 CNAs	
5 LPNs		2 LPNs		1.5 LPNs	
4 RNs		2 RNs		1 RNs	
5 Med. Clerks		3 Med. Clerks		1.5 Med. Clerks	
2 Clinic ADM		.5 Clinic ADM		.5 Clinic ADM	
24 Total		**9.5 Total**		**7 Total**	
36 EXAM ROOMS		**19 EXAM ROOMS**		**10 EXAM ROOMS**	

CAPACITY MODEL SUMMARY		**0101 TDA SUMMARY**		**NEEDED**	
SUPPORT STAFF		**SUPPORT STAFF**		**SUPPORT STAFF**	
CNAs	**25**	**CNAs**	**12.5**	**CNAs**	**12.5**
LPNs	**20**	**LPNs**	**8.5**	**LPNs**	**11.5**
RNs	**10**	**RNs**	**7**	**RNs**	**3**
MED CLERKS	**15**	**MED CLERKS**	**9.5**	**MED CLERKS**	**5.5**
TOTAL	**70**	**TOTAL**	**37.5**	**TOTAL**	**32.5**

SUPPORT STAFF COSTS (Required to achieve 2.8 ratio)					
12.5 CNAs @ $27,100	=	$338,750			
11.5 LPNs @ $33,800	=	$388,700			
3 RNs @ $59,600	=	$178,800			

ALT 1 OPTION COSTS AND PERSONNEL

Family Practice		Internal Medicine
Enrollees: 17,468		**Enrollees: 7,240**
1 BMM Providers		0 BMM Providers
13 MIL Providers		4 MIL Providers
1 RS Providers		2 RS Providers
6 Civilian Providers		4 Civilian Providers
14.3 TOTAL FTEs		**8.7 TOTAL FTEs**
SUPPORT STAFF		**SUPPORT STAFF**
8 CNAs		2 CNAs
5 LPNs		2 LPNs
4 RNs		2 RNs
5 Med. Clerks		3 Med. Clerks
2 Clinic ADM		.5 Clinic ADM
24 Total		**9.5 Total**
36 EXAM ROOMS		**19 EXAM ROOMS**

CAPACITY MODEL SUMMARY		0101 TDA SUMMARY		NEEDED	
SUPPORT STAFF		SUPPORT STAFF		SUPPORT STAFF	
CNAs	22	CNAs	10	CNAs	12
LPNs	17	LPNs	7	LPNs	10
RNs	8	RNs	6	RNs	2
MED CLERKS	14	MED CLERKS	8	MED CLERKS	6
TOTAL	61	TOTAL	31	TOTAL	30

SUPPORT STAFF COSTS (Required to achieve 2.8 ratio)

12 CNAs @ $27,100	=	$325,200
10 LPNs @ $33,800	=	$338,000
2 RNs @ $59,600	=	$119,200
6 MED CLERKS @ $27,100	=	$162,600

ALT 2 OPTION COSTS AND PERSONNEL

Family Practice		Internal Medicine
Enrollees: 17,468		**Enrollees: 7,240**
1 BMM Providers		0 BMM Providers
13 MIL Providers		4 MIL Providers
1 RS Providers		2 RS Providers
6 Civilian Providers		4 Civilian Providers
14.3 TOTAL FTEs		**8.7 TOTAL FTEs**
SUPPORT STAFF		**SUPPORT STAFF**
8 CNAs		2 CNAs
5 LPNs		2 LPNs
4 RNs		2 RNs
5 Med. Clerks		3 Med. Clerks
2 Clinic ADM		.5 Clinic ADM
24 Total		**9.5 Total**
36 EXAM ROOMS		**19 EXAM ROOMS**

CAPACITY MODEL SUMMARY		0101 TDA SUMMARY		NEEDED	
SUPPORT STAFF		SUPPORT STAFF		SUPPORT STAFF	
CNAs	19	CNAs	10	CNAs	9
LPNs	14	LPNs	7	LPNs	7
RNs	6	RNs	6	RNs	0
MED CLERKS	13	MED CLERKS	8	MED CLERKS	5
TOTAL	52	TOTAL	31	TOTAL	21

SUPPORT STAFF COSTS (Required to achieve 2.4 ratio)		
9 CNAs @ $27,100	=	$243,900
7 LPNs @ $33,800	=	$250,600
0 RNs @ $59,600	=	$0