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Clinic Management, Productivity, and Cost: Results From Selected Navy Clinics

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Executive summary

CNA was tasked by the Navy's Bureau of Medicine and Surgery (BUMED) to examine the delivery of primary care to beneficiaries at a selected set of Navy clinics. Some delivered primary care at sites separate from, but near, major Navy medical centers. Some were family practice clinics (family practice being a specialty associated with primary care) located within medium-sized naval hospitals engaged in the graduate medical education of interns and residents.

Table 1 shows the specific primary care and family practice clinics that were part of our study. The clinics were "matched" based on beneficiary characteristics. One clinic set provides care mainly to active duty beneficiaries; another serves mainly active duty, dependents, and some retirees. Two clinics are contracted through TRICARE and provide care almost exclusively to dependents and retirees. Finally, we examined the family practice clinics at NH Camp Pendleton and NH Jacksonville—both provide care to all beneficiary groups: active duty, dependents, and retirees.

Table 1. Comparative clinic sets

	Type of clinic		
	Primary care		
Beneficiaries served	NMC Portsmouth	NMC San Diego	Family practice
Mainly active duty	NBMC Sewell's Point	NBMC Naval Station	
Active duty, dependents, and retirees	NBMC Little Creek	NBMC Naval Training Center	NH Camp Pendleton NH Jacksonville
Mainly dependents	Virginia Beach	Clairemont	

Approach

The study included site visits to the clinics to gather information from each clinic and, in conjunction with data and information from standard Navy and Military Health System (MHS) data sources, to understand how they manage the business of providing outpatient primary care. We explored several issues, including:

- Understanding current clinic management practices
- Developing measures of productivity that consider the unique constraints and missions faced by military clinics
- Determining appropriate measures of health care costs in the direct care and purchased care systems
- Examining the implications of other influences, such as the incentives associated with the managed care contracts.

In this report, we provide a list of findings and recommendations that we believe should help Navy Medicine implement best practices in these and other clinics within the medical system.

Results

Table 2 presents key productivity and cost findings for all clinics. First, we present a few measures of productivity at each site. The first two measures focus on the panel, or number of each site's enrollees, for which the site's providers are responsible. The one labeled *simple* represents a calculated ratio of the number of enrollees to all providers in the clinic. This and all other productivity measures depend crucially on the accuracy of how many beneficiaries enrolled at the site and, perhaps even more important, the number of providers delivering patient care. As we'll show, the latter is particularly subject to inaccurate reporting. The measure labeled *effective* takes account of the fact that each site is not alone in providing care for its enrollees—other sites provide some of this care. But, because sites do more than provide care to their own enrollees, we present one measure of a site's total productivity—the total number of visits per provider. The final measure shown pertains to each clinic's average cost of producing outpatient visits.

Table 2. Selected results for key productivity and cost measures, all clinics studied

	Panel size			
	Simple	Effective	Visits/provider	Average visit cost ($)
Primary care clinics				
NTC	904	996	3,879	159
Little Creek	1,381	1,691	5,473	88
Naval Station	435	1,013	3,138	138
Sewell's Point	901	1,882	5,324	82
Clairemont	1,757	2,016	6,627	99
Virginia Beach	2,222	2,345	8,273	92
Family practice clinics				
NH Camp Pendleton	785	962	3,478	108
NH Jacksonville	928	1,229	4,557	109

The numbers shown suggest several conclusions. First, the simple panel sizes vary greatly across sites, but that's mainly because of differences in the proportion of the workload they do for their own enrollees. Correcting for it and other factors usually leads to higher values and smaller variation in panel sizes across sites. Accounting for all workload, the results imply that the sites were generally productive, as shown by the visit-to-provider measure. There was a wide range, but most met or exceeded civilian productivity benchmarks. This finding generally holds when the complexity of the services provided were used instead of the visit or encounter. The final measure—the average visit cost—is in the $82 to $159 range across the clinics. Although we don't show it here, these costs were still significantly higher than our estimated cost of a visit to the civilian network.

Finally, we offer several recommendations based on our analysis. First, the MTFs and clinics must improve the accuracy of their staffing data. The system can't be managed effectively if the labor input is measured inaccurately. Second, develop reliable and believable cost measures. In today's environment, costs within the system and in comparison with the civilian health care sector will be scrutinized (especially under the new managed care support contracts, e.g., TNEX), and it's important to have reliable measures. Third, staff training and turnover transition should be evaluated. Fourth, management policies should focus on managing no-shows, the appointment booking system, and the referral tracking system.

Introduction and background

The Department of Defense (DOD) provides its beneficiaries with health care services in a number of ways. Beneficiaries can go to the military medical treatment facilities (MTFs)—branch clinics, small hospitals, community hospitals, or medical centers—or to civilian providers and facilities provided by the managed care support contractors throughout the continental U.S. (CONUS) and in many areas overseas as well. The beneficiaries can enroll in TRICARE Prime, which provides them access to care (much like any enrollee in a private health care plan) or they can use clinics and MTFs on a space-available basis as a nonenrollee. Although some beneficiaries don't use the system at all, many if not most beneficiaries receive their care through the variety of options open to them. They may use the local clinic for most of their primary care needs, other clinics and hospitals on occasion, and even the civilian network when the need arises.

Clearly, the system is complex and can be difficult to manage. Clinics and MTFs must manage the care of their beneficiaries, ensuring that care is available when needed, to their own enrollees, to other sites' enrollees, and to those who don't enroll. They need to provide these services in a cost-effective manner, while meeting all of their military missions. How successful many of these clinics are is subject to debate. Because of the constraints placed on them and the unique nature of military medicine, which has its own set of incentives and data collection requirements, it's important to examine whether and which clinics are performing as expected by the Navy's Bureau of Medicine and Surgery (BUMED).

BUMED tasked CNA to examine a group of these clinics that offer primary care—the usual entry point to a health care system—and focus on how they do their business, which ones appear to be successful, and what kinds of lessons can be learned from them to impart throughout the system. This study was undertaken at the request of Deputy Chief BUMED, Resource Management/Comptroller (code

M-8), with the active participation of Deputy Chief BUMED, Medical Operations Support (code M-3M).

Study approach and site selection

From the beginning, BUMED directed CNA to focus on the delivery of primary care (PC). Further, they wanted an examination of clinics not at the large medical centers, but at branch clinics or family practice clinics in medium-sized hospitals. It became clear that an in-depth analysis could be provided to only a limited number of such clinics. Included in the project was the goal of visiting most, if not all, of the clinics chosen. We were not to go and "park" ourselves at their doorstep, but rather to obtain the clinics' own perspectives on their business, understand how they managed the facility, special problems they may encounter, new initiatives they may have undertaken (perhaps through the Navy's own optimization process), and so on. We were to visit only once or twice, the latter serving if possible as a return visit after we reached some tentative conclusions.[1]

Given the organizational structure in the Portsmouth area, with three officers in charge (OICs) of eight clinics, we visited three clinics, one associated with each OIC. To keep our analysis "balanced," we visited three clinics in the San Diego area as well. It was also decided to focus on family practice clinics within a medium-sized naval hospital offering family practice graduate medical education (GME).

Although the term *primary care* may not require precise definition to those in the health care field, we realized that defining it as precisely and consistently as possible was important if we were to make meaningful comparisons across the clinics. Therefore, given the way many of the data are organized, both in terms of workload and finance, we defined primary care within the larger branch clinics by focusing on

1. Although an early focus concerned various optimization initiatives, it became clear that in most cases, these initiatives are either an integral part of their current business practices or will help fund future projects. Examples of the latter include Sewell's Point's sports medicine clinic or the San Diego area clinics' initiatives for having their independent duty corpsmen work more directly with the clinics' physicians.

specific 3-digit Medical Expense and Performance Reporting System (MEPRS) codes. We defined primary care outpatient workload as a visit to one of the codes listed in table 3.

Table 3. Defining primary care in the clinics

MEPRS code	Description
BDA	Pediatrics clinic
BDB	Adolescent clinic
BDC	Well baby clinic
BGA	Family practice clinic
BHA	Primary care clinic
BHB	Medical examination clinic
BHI	Immediate care clinic

We have coupled the clinics, three associated with NMC San Diego and three associated with NMC Portsmouth, into "matched" sets based on enrollee demographics. The specific clinics that we visited and studied in depth are shown in table 1 of the previous section.[2] Note that two of them, the TRICARE Outpatient Clinic (TOC) Claremont and the TRICARE Prime Clinic (TPC) at Virginia Beach are essentially civilian run and managed.

To put the clinics chosen in some perspective, table 4 presents all of the branch clinics in the Portsmouth and San Diego areas, together with the number of outpatient primary care visits provided to Navy and other DOD beneficiaries. We've highlighted in bold the three clinics in each area that we visited and that we focus on in this study. We've also included the number of primary care visits provided at the local medical centers, i.e., Naval Medical Center (NMC) San Diego and NMC Portsmouth.

2. The term *clinic* requires further explanation. We begin with naval branch medical clinics (NBMCs) at various locations around the San Diego and Portsmouth areas. Within each NBMC is a collection of smaller clinics, some providing primary care services, others providing non-primary-care services (physical therapy, sports medicine, women's health, etc.). We focus on those providing primary care services and refer to them as the primary care clinics within the larger NBMC.

Table 4. MTFs and clinics in the San Diego and Portsmouth areas—primary care visits

Clinic or MTF	DMIS[a]	Number of visits[b]
San Diego area		
NMC San Diego	0029	157,790
NBMC MCRD San Diego	0230	30,414
NBMC NAS North Island	0231	41,140
NBMC NAS Miramar	0232	47,020
NBMC Coronado	0233	6,466
NBMC El Centro	0239	3,623
NBMC Naval Training Center	**0407**	**42,779**
NBMA NALF San Clemente	0414	1,031
NBMC Naval Station (32nd St.)	**0701**	**45,332**
TOC Clairemont	**6207**	**75,724**
TOC Chula Vista	6215	85,326
Total visits (San Diego area)		537,645
Portsmouth area		
NMC Portsmouth	0124	86,097
NBMC Little Creek	**0378**	**121,275**
NBMC NSY Norfolk	0380	4,789
NBMC Yorktown	0381	6,126
NBMC Dam Neck	0382	19,867
NBMC Oceana	0387	93,521
NBMC Naval Station Sewell's Point	**0508**	**107,793**
NBMC Chesapeake	0519	5,985
TPC VA Beach	**6214**	**76,432**
TPC Chesapeake	6221	64,075
Total visits (Portsmouth area)		585,960

a. The Defense Medical Information System 4-digit code identifies a particular clinic or MTF.
b. From the World-wide Workload Report (WWR) for FY 2002.

The values for total visits indicate that together, these areas provide more than 1.1 million primary care visits which represents about 27 percent of all primary care visits at all Navy facilities (based on our estimate of 4.1 million visits Navy-wide). In San Diego, the three clinics in our study provide a total of about 164,000 visits, or about 30 percent of all San Diego area primary care visits. The three Portsmouth clinics in our study provide more than 305,000 visits, or about 52 percent of the visits in the Portsmouth area.

Turning to the family practice clinics in our study, we consulted with both NH Camp Pendleton and NH Jacksonville, which indicated that the single 3-digit code "BGA" is the code they use for family practice outpatient visits in their facilities. Table 5 provides their DMIS codes and visit count, as well as the two other major family practice teaching facilities (we've excluded NH Camp Lejeune only because its program is so new).

Table 5. MTFs with family practice GME programs[a]

MTF	DMIS	Number of visits
NH Camp Pendleton	**0024**	**70,689**
NH Pensacola	0038	85,819
NH Jacksonville	**0039**	**73,370**
NH Bremerton	0126	58,470
Total visits (FP GME sites)		288,348

a. Excludes the new program at NH Camp Lejeune.

Data

The data we relied on came from a variety of sources. For the most part, we relied on data:

- From standard Navy or DOD sources, such as MEPRS or the various claims data from the direct care or purchased care systems,
- From the clinics themselves.

The standard direct care sources used in this analysis, in addition to MEPRS, included the Expense Assignment System, Version IV (EAS IV), the Standard Ambulatory Data Record (SADR), and the Standard Inpatient Data Record (SIDR). In most cases, we drew the data for these either directly from the online version of EAS IV or from the MHS Mart (M2). The EAS IV system was useful for obtaining full-time equivalent (FTE) counts of providers and support staff for each site of interest and for various financial information. The M2, in addition to what we listed above, allowed us to pull enrollment information from DEERS. We relied on the M2 for much of what we drew for the purchased care data. It gave us access to health care claims, both from

the Health Care Service Record professional file (HCSR-P) and the Health Care Service Record institutional file (HCSR-I).

In addition to the claims from the M2, the TRICARE Management Activity (TMA) generated a population-based sample of direct and purchased care workload for us. The data represent a 5-percent random sample of all DOD beneficiaries. For each beneficiary, TMA added all of his or her direct and purchased care workload. In other words, the dataset includes direct care data drawn from the SADRs and SIDRs and purchased care data drawn from the HCSR-P and HCSR-I.

We also developed a set of questions that we asked the clinics to answer after our visit. The questions, in addition to what we received during our visit, were designed to fill in gaps in our knowledge about the clinics, and to allow us to compare their data with what we created from the standard sources available to BUMED and others (including CNA). As we indicate in following sections, there were often significant differences between what we created and what they provided. Sometimes the differences may have been caused by somewhat different definitions of a particular variable, such as what constitutes the work associated with primary care visits. But, other differences were more important and potentially problematic. For example, it's virtually impossible to obtain useful measures of clinic productivity if the counts of personnel offering the services are inaccurate. We will show that this was a problem we encountered in conducting our analysis.

Characteristics of the clinics' enrollees

We begin by describing the beneficiaries receiving care at each clinic, first for the primary care clinics and then the family practice clinics. An important focus of our analysis concerns the site's own enrollees. Understanding who receives care at the sites—whether a site's own enrollees, other clinic and MTF enrollees, or nonenrollees—helps in any evaluation of clinic performance and resourcing. Other sites' enrollees and nonenrollees may come in only for episodic care; therefore, clinics generally focus on the care they need to provide to their own enrollees, which, in turn, generally depends on the enrollees' demographic characteristics.

Enrollee characteristics at NTC, NBMC Naval Station, and Clairemont

Health care needs differ by age and by gender. Active duty personnel are generally in good health, although they may require some health care services before leaving for deployment. Therefore, the amount of health care resources required at different sites usually depends on the demographics of the population served. To show the differences in populations, we provide the number of male and female active duty enrollees by site, as well as three age groupings for non-active-duty dependents and retirees. The groups are men and woman 17 and younger, those between 18 and 64, and those 65 and over.

Table 6 presents the values for the three San Diego clinics' enrollees. The table shows clearly how the populations differ across the three clinics. The enrollees at NBMC Naval Station (NS) are almost all active duty men and women (mostly men) with very few non-active-duty beneficiaries, and no one older than 65. The TRICARE Outpatient Clinic (TOC) at Clairemont (Cl) has almost no active duty, few retirees older than 65, but a lot of children; in fact, almost half of the population it serves is under 18. In addition, almost two-thirds of its enrolled population is female. The enrolled population at NBMC Naval Training Center (NTC) has the most diverse set of characteristics—39 percent are on active duty and about 12 percent are 65 and older.

Table 6. Demographic characteristics of enrollees at three San Diego area clinics

	Female	Male	Total
NBMC Naval Training Center			
Active duty (AD)	396	3,010	3,406
Non-AD			
<18	720	746	1,466
18 to 64	2,023	713	2,736
65 and over	494	572	1,066
Total	3,633	5,041	8,674
NBMC Naval Station			
AD	664	4,374	5,038
Non-AD			
<18	0	0	0
18 to 65	1	2	3
65 and over	0	0	0
Total	665	4,376	5,041

Table 6. Demographic characteristics of enrollees at three San Diego area clinics (continued)

	Female	Male	Total
TOC Clairemont			
AD	19	0	19
Non-AD			
<18	3,896	4,047	7,943
18 to 64	6,550	2,162	8,712
65 and over	11	5	16
Total	10,476	6,214	16,690

Enrollee characteristics at Little Creek, Sewell's Point, and Virginia Beach

Table 7 presents the demographic characteristics of the three Portsmouth area clinics. The characteristics of the enrollees served at each Portsmouth area clinic bear many similarities to the "matched" set of clinics in the San Diego area. NBMC Sewell's Point (SP) serves mostly active duty, although it serves many more non-active-duty enrollees than does the Naval Station. NBMC Little Creek (LC) serves both active duty and non-active-duty, as does NTC. The civilian clinics on each coast serve few active duty, and the vast majority of their enrollees are dependents and retirees. One difference between the two sets of clinics is that the Portsmouth area clinics serve larger populations. Little Creek has more than three times the number of enrollees as NTC. Sewell's Point also has three times as many enrollees as the Naval Station. The two civilian clinics are the most similar, with the TPC Virginia Beach (VB) serving about 18,000 enrollees versus almost 17,000 at Clairemont. Overall, however, the characteristics of their enrollees—many children and women, almost no seniors—are very similar.

Table 7. Demographic characteristics of enrollees at three Portsmouth area clinics

	Female	Male	Total
NBMC Little Creek			
Active duty (AD)	732	4,434	5,166
Non-AD			
<18	6,181	6,360	12,541
18 to 64	8,676	2,730	11,406
65 and over	17	7	24
Total	15,606	13,531	29,137
NBMC Sewell's Point			
AD	2,436	9,940	12,376
Non-AD			
<18	1,154	1,167	2,321
18 to 64	1,831	407	2,238
65 and over	1	0	1
Total	5,422	11,514	16,936
TPC Virginia Beach			
AD	1	9	10
Non-AD			
<18	4,516	4,772	9,288
18 to 64	6,484	2,212	8,696
65 and over	5	0	5
Total	11,006	6,993	17,999

Comparing the enrollees' characteristics

We've just described some of the differences across the six clinics; table 8 quantifies them further. We've placed the data for matched sets of clinics next to each other and grouped some of the categories in tables 6 and 7 to make it easier to compare the enrollees' characteristics. We show the percentages of enrollees who are male and on active duty, and the percentage in each of the three age groups for dependents and retirees.

Table 8 shows that some differences exist even between the matched sets of clinics. NTC has a larger percentage of its enrollees who are on active duty, who are male, and 65 and older than does Little Creek. The Naval Station serves fewer enrollees, but almost all are active duty and almost 90 percent are male. Sewell's Point is much larger and,

although 71 percent of its enrollees are on active duty, the remaining enrollees are split between children and adults ages 18 to 64. Finally, as indicated earlier, the civilian clinics are quite similar, with Virginia Beach seeing slightly more males and children than does Clairemont. Overall, the enrollees of these two civilian-managed clinics are the most similar.

Table 8. Percentage of enrollees in each category, by clinic

Characteristic	NTC	Little Creek	Naval Station	Sewell's Point	Clairemont	Virginia Beach
Active duty	42	17	~100	71	~0	~0
Male	59	46	87	67	37	39
Non-active-duty	58	83	~0	29	~100	~100
<18	17	44		15	48	52
18 to 64	30	39		14	51	48
65 and over	11	~0		~0	~0	~0

Enrollee characteristics at the family practice clinics

Obtaining enrollee characteristics for the family practice clinics at naval hospitals is harder than at the branch clinics. At the branch clinics, virtually every beneficiary who enrolls does so through one of the primary care clinics. So, we can draw these characteristics directly from the M2. But, at larger facilities, such as NH Camp Pendleton or NH Jacksonville, beneficiaries can also enroll at other clinics, such as the internal medicine clinic.

Obtaining accurate estimates of the number of enrollees provides a good example of why the direct contacts with the family practice clinics were so important. They provided the additional information we required. Unfortunately, they broke out their enrollees' characteristics in somewhat different ways, as shown below.

Table 9 presents the information given to us by the clinics. The family practice clinic at Camp Pendleton had more detailed information on the gender and age breakdown, but no breakdown by beneficiary category. Jacksonville kept track of active duty enrollees and the over-65 population, but it could not provide the gender and ages of their enrollees. In total, however, the two FP clinics had relatively similar

numbers of enrollees—almost 15,400 at Camp Pendleton and about 14,000 at Jacksonville.

Table 9. Demographic characteristics of enrollees at two family practice clinics

	Female	Male	Total
FP at NH Camp Pendleton			
< 18	2,153	2,276	4,429
18 to 64	7,546	2,141	9,687
65 and over	619	656	1,275
Total all enrollees	10,318	5,073	15,391
FP at NH Jacksonville			
AD			964
AD family members			7,730
Non-AD			4,409
65 and over			974
Total all enrollees			14,007

Descriptive analysis of the clinics

In this section, we provide several observations of the primary care clinics and then follow with a similar set of observations on the two family practice clinics.[3] The objective of the descriptive analysis is to provide an independent assessment or review of various aspects of clinic administration. Our approach to the analysis correlates our qualitative observations to the quantitative measures and findings, where possible. This method should allow us to corroborate our observations and findings with measured performance.

Our analysis of clinic management is based on an assessment method emphasizing three general areas: resources, infrastructure, and processes. The first two will be covered in this section, i.e., before we provide a quantitative assessment of the workload and costs associated with the various clinics. After describing our findings for each clinic, we will discuss what we believe are some of the key processes the clinics use and then suggest some improvements. Figure 1 illustrates our methodology.

First, for resources, we would normally examine aspects of clinic management in terms of clinic personnel and financing. However, we will deal with financing separately in the section describing our quantitative analysis. We believe it deserves an entire section, given the uniqueness of financing for the Military Health System. Infrastructure focuses on facilities and data. Later in the paper, we examine the key processes, which can be summarized by the following:

- Patient Scheduling Management
- Records Management
- Utilization Management
- Population Health and Disease Management.

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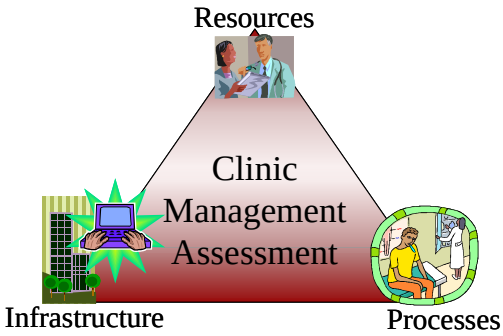
3. We did not receive qualitative information from NH Jacksonville for inclusion in this section. The information we present on the family practice clinics reflects what we obtained from NH Camp Pendleton.

Figure 1. Clinic management assessment methodology



Resources

The MHS must balance the interdependent missions of benefit and readiness. This places unique constraints on clinic management. Our analysis of resources incorporates and accounts for MHS-specific characteristics. We have focused our analysis on organization structure, management, labor mix, training, and resource accounting.

Clinic organizational structure

NMC Portsmouth and NMC San Diego have unique organizational structures. NMC Portsmouth is organized around service lines and product lines. The product lines have responsibility for resources. Each primary care clinic has an Officer in Charge (OIC). Each clinic has a clinical manager and nursing manager responsible for the clinical operations. Under the current structure, one OIC has accountability for multiple clinics. The OICs provide the Executive Steering Committee (ESC) briefings biannually. The OICs, working with their staff, develop the annual plans and performance measures for the clinics. There is some informal sharing of information between OICs; however, the structure does not require common goals or performance measures. There are informal lines of communication between the OICs that may lead to the implementation of standardized practices.

NMC San Diego is organized into directorates. Primary care is a separate directorate. The Executive Steering Committee (ESC) is com-

posed of the leadership of the directorates. The ESC meets weekly and has ongoing communication to manage resources. The primary care clinics report the Director of Primary Care. The clinics are managed through Clinic Management Teams. Each team is led by a branch head responsible for primary care clinic operations and facility management, which supports other directorates' product lines. The Director of Primary Care develops the annual plans, job accountabilities, and performance metrics for the primary care clinics. The director of primary care requires the clinics to submit standard monthly performance reports.

The family medicine department at Camp Pendleton is managed through the naval hospital organization structure. The department is administered by a military registered nurse (RN) business manager. The manager administers the templates, ensures access, and minimizes unmet demands. This is accomplished by working with the department clinic scheduler to maximize provider time in clinic, optimize templates, and forecast demand. The business manager also works closely with the access-to-care center to ensure that daily needs are continually assessed and additional appointments are opened up when possible.

Management

The NMC Portsmouth organizational structure requires that the OICs have fairly extensive experience in clinic management. The NMC San Diego structure leverages quite a bit of the executive responsibilities to the directorate level. Under either structure, the clinic manager position requires extensive experience in clinic management.

We found that the management at the clinics had varying levels of health administration experience, including training on the data and decision support tools. NMC Portsmouth management is structured around specific clinics. Virginia Beach and Little Creek shared government service resources with extensive MHS and civilian clinic management experience. The management relied on the decision support tools available online through the TRICARE website. The

clinic management at Sewell's Point had less experience and was not aware of the decision support tools available.

The management at NMC San Diego also had varying levels of experience. However, the organizational structure leveraged information across the clinics allowing for knowledge-sharing and cross-training of employees. As in NMC Portsmouth, management relied on the decision support tools available online through the TRICARE website.

Labor mix

The primary category of labor within the MHS is active duty military personnel. The active duty (AD) military personnel have the responsibilities of their rotational job assignments, collateral duties, and military training. The rotational aspect of job assignment is intentional to develop multidisciplined active duty personnel. MHS has several types of contracted labor arrangements to augment the military personnel in support of the readiness mission and possible deployment:

- *Government service (GS) contract employees* - personnel contracted directly with the government.
- *Health service (HS) contract employees* - personnel obtained through a company contracted by the government.
- *Resource sharing (RS) employees* - personnel obtained through the Managed Care Support Contractor.

Each employee category has different procurement policies, cost structure, and replacement clause. Each primary clinic employs a combination of active duty military personnel and contracted labor arrangements. Table 10 provides an overview of the labor mix at each primary clinic we visited.

Table 10. Labor mix by clinic

NMC Portsmouth		NMC San Diego	
Clinic	Labor mix	Clinic	Labor mix
Sewell's Point	AD, limited GS	Naval Station	AD, limited GS
Little Creek	AD, GS, HS	Naval Training Center	AD, GS, RS
TPC Virginia Beach	GS, HS	TOC Clairemont	RS

The NMC Portsmouth clinics do not use resource sharing arrangements mainly because of the cost differential between RS and GS or HS personnel. TOC Clairemont should have converted from resource sharing to health service contracts in April 2003. The resource-sharing arrangements are used as a last resort at NMC San Diego because of the cost differential.

The NMC Portsmouth and NMC San Diego clinics have health service contracts with 100 percent fill clauses providing replacements for health service contract personnel. The TRICARE-based clinics, Virginia Beach and Clairemont, are almost 100 percent contracted personnel with military leadership. This provides personnel who are dedicated almost exclusively to the clinic duties, and the labor mix will be backfilled whenever necessary.

A labor mix with a higher percentage of active duty military personnel usually means a larger difference between assigned bodies and actual FTEs in the clinics. The MHS has a goal of clinic duty availability of 75 percent, or 0.75 FTE. Additionally, active duty personnel are deployed and rotated according to readiness and training with no replacement guarantee. Given these factors, the clinics with the active duty in the labor mix (Sewell's Point, Little Creek, Naval Station, and Naval Training Center) have a more arduous task of effective personnel management. As an example provided to us by the office of the Director for Primary Care in San Diego, one of the clinics had 13 providers listed, but they averaged less then 0.5 of an FTE in the clinic. There may be some good reasons for this, including part-time staff and transfers in and out of the facility, but it would seem likely to lead to inefficiencies in the cost of delivering medical care.

NH Camp Pendleton's family practice clinic uses a combination of military and contract personnel. The contract personnel maintain access standards and are the most clinically focused. The military personnel require the most flexibility in scheduling given their collateral job requirements. NH Camp Pendleton has found the military personnel provide the greatest benefit to the command because of their broad spectrum of abilities.

Training

Trends we found across all clinics were the systemic effects of balancing the benefit and readiness missions. The need to expose the active duty military personnel to many disciplines, collateral job requirements, tour length, and deployment resulted in high employee turnover, difficulty accounting for personnel time, low level of job-specific experience, and a preponderance of on-the-job training.

A mechanism should be developed to minimize these effects. The high turnover and low experience levels are a by-product of the dual mission and are difficult to control. Sound training programs for key positions are critical. Personnel assigned to new positions should be evaluated by the clinic management and feedback provided to the training programs to illuminate areas of the training that may need improvement.

Resource accounting

A workforce that is highly mobile with fragmented accountabilities needs to have a comprehensive and simple time accounting process. An issue we found across the primary care clinics was the lack of ability to easily convey information on resource counts. It is extremely difficult to assess performance without timely and accurate resource count information. The clinics reported a lack of consistent and accurate entry of personnel time into the MEPRS database, despite a pervasive understanding of the time accounting policies.

NH Camp Pendleton did not have the issues with resource accounting that we found with the primary care clinics. The management was confident in the accuracy of the MEPRS data. The management conducted regular audits of the data to ensure their accuracy. We found consistency in the numbers provided by management and the numbers we obtained from the EAS4 system. The extreme contrast in the perceptive reliability of the data for NH Pendleton, compared with the other clinics, needs to be further researched.

To fully understand performance across the health system, one must have accurate and complete resource accounting. Personnel should be trained and held accountable for timely and accurate time

accounting. In addition, the contract personnel need to be fully accounted for and the type of contract identifiable. This will allow for more meaningful productivity analyses.

Infrastructure

Facilities

We visited each of the medical clinics and toured the facilities. Each clinic had a unique configuration and varied in size. The TRICARE-contracted clinics tended to have newer and somewhat smaller facilities, which offered added flexibility in terms of configuring the space as required. The military clinics tended to be older and larger, with less flexibility for reconfiguring as needed.

The active duty clinics, Sewell's Point and Naval Station, are the largest facilities. The facility at Sewell's Point was in the worst state of disrepair. Current funding for infrastructure improvement at Sewell's has been minimal because new facilities are being developed. The next set of military clinics, NBMCs Little Creek and Naval Training Center, were also large and fairly old. We believe all four of the clinics implemented a patient flow configuration that was optimized given the layout of the facilities. Little Creek and NTC had the optimal configuration of two exam rooms and one office per provider. The branch clinics at the Naval Station and Sewell's Point usually had one exam room and one office per exam room per provider.

The TRICARE contract clinics, Virginia Beach and Clairemont, were recently constructed. The facilities had relatively flexible configurations with the ability to accommodate growth and shifts in the patient population. Each had about 16,000 square feet of space devoted to their (mostly) primary care services.

Each clinic expressed a need for additional space. The military clinics were constrained by the limitation of the physical space of the facility, and the TRICARE-contracted clinics were constrained fiscally.

The family practice clinic at NH Camp Pendleton is located on the first floor of the hospital and occupies 17,296 square feet. The naval

hospital was built in the early 1970s as an inpatient facility to receive casualties from Vietnam. The original design does not easily adapt to clinic care patient flow. The check-in and check-out areas are combined, creating a bottleneck in patient flow. There are no nursing stations or treatment rooms.

The number of providers in a family practice clinic is limited to 17 to maintain two exam rooms per provider. Staff providers have their own offices most of the time. A few staff share an office with other providers. House staff all share offices with at least 1 other provider. The patient load for the clinic requires over 50 providers, including house staff. The clinic hours have been expanded to spread the workload due to space constraints.

Data issues

Data are components of clinic management but are often minimized in the ongoing clinical operations and management. The MHS has extensive and complex information and data processing systems. Along with these intricate systems, clinic personnel have various levels of understanding of the data, as previously discussed above. These circumstances have caused difficulties in data reconciliation, which often means that important variables were not completely captured or their values were inaccurate.

Difficult data reconciliation

The MHS includes systems that are required to support military claims processing, payroll, finances, decision support, and a host of other functions. In addition, the managed care contractors have systems to support their contracted responsibilities. These systems have interfaces, but any environment with multiple systems has the potential for reconciliation issues with the data.

It was extremely difficult to reconcile the staffing information from NMC Portsmouth and NMC San Diego or to obtain an accurate picture over a period of time. For staffing (FTE) data, we relied on data from EAS IV. The management at most of the primary clinics was not comfortable with accuracy of the MEPRS data. We requested staffing information from each of the clinics to compare with the information

we extracted from EAS IV. For NMC San Diego, we have used the information supplied by management. These data issues are discussed in more detail within the quantitative analysis.

NH Camp Pendleton staff were extremely knowledgeable about the data and confident in the accuracy of their own records. The management relied on automated sources for resource accounting and conducts regular audits, demonstrating a strong hands-on administration of the data. We had no issues in reconciling our staffing data with those provided by management.

Lack of capture and accuracy

BUMED clinic optimization efforts include the importance of CPT (procedure) and ICD-9 (diagnosis) coding efforts. Accurate coding provides the ability to capture relative value unit (RVU) workload, to identify trends for population health issues, and to conduct third party billing. Workload at the clinic level is captured by three systems:

1. The Ambulatory Data Module (ADM) coding system
2. The Composite Health Care System (CHCS)
3. The Medical Expense and Reporting System (MEPRS).

ADM captures the complexity of what providers do during a typical visit (often summarized by the RVU). Specifically, claims information was being captured, and the completeness of the data capture is monitored through the ADM coding system compliance rate. Most of the clinics have a compliance rate near 100 percent.

We did have some concerns about the accuracy of the data reported. The accuracy varied depending on the type of personnel doing the coding. The coding is often completed by a provider or other personnel who lack formal coding experience and/or training. NMC San Diego did use full-time coders at NTC and Clairemont, whereas providers do their own coding at Naval Station. The main campus provides services at the clinic and monitors coding (audit) and provides feedback to supervisors and coders to provide input/guidance. Sewell's Point and Little Creek conduct retrospective sample audits and provide feedback to the providers and coding personnel.

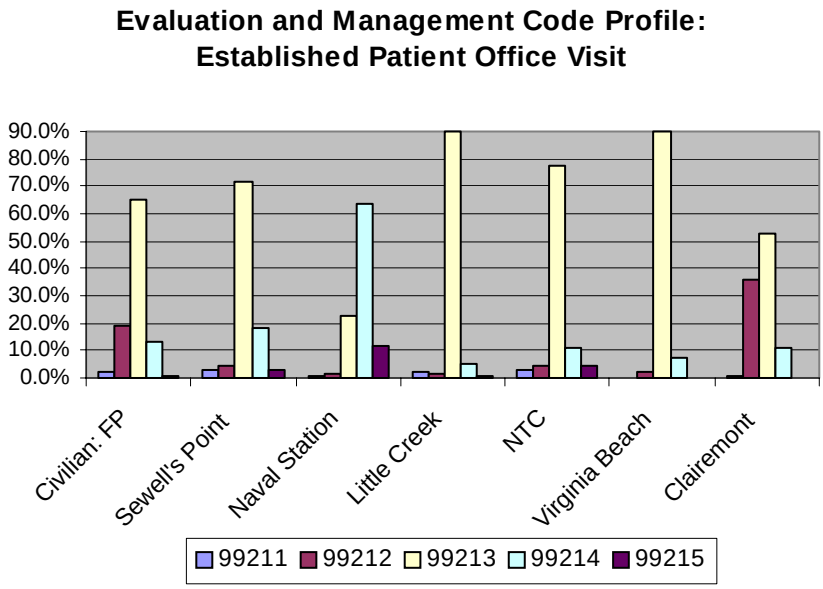
Virginia Beach employs contract physicians with coding experience from the private sector.

For claims data, NH Camp Pendleton is working on accuracy and precision issues in coding as opposed to noncompliance. NH Camp Pendleton has received five contract coders to improve coding

Coding improvement is one of the MHS optimization tasks in an effort to improve population health. Examining diagnosis and procedure codes provides a profile of patient complexity and assesses how the providers at the clinic provide medical care. Coding will allow administrators to capture accurate patient information to maximize clinic resources. It is also important for accurate billing under the new managed care support contract.

When we think of ambulatory encounters for established patients, one might anticipate that the distribution of the visit type will show the majority to be of moderate complexity and that relatively few visits will be considered the least and most complex. Figure 2 shows five E&M codes representing an established patient office visit and the distribution at each clinic.

Figure 2. E&M codes at six PC clinics



Civilian family practice information as recorded in the 2001 Physcape PracticeProfiler database sponsored by the Medical Group Management Association (MGMA) is also shown. The civilian FP data suggest very few least and most complex visit types with similar frequency for codes 99212 and 99214. The most common E&M code is 99213. With the exception of Naval Station, the most common code is 99213, which exhibits variability. Clairemont's use of 99212 is significantly different from that of other clinics. The wide variation between the clinics and civilian data may possibly be the result of population differences or coding experience. Further analysis is required to understand the reasoning for these discrepancies.

In addition to examining E&M codes, we surveyed the top five diagnoses for each of the matched clinics. Tables 11 through 14 present our results. For Sewell's Point and Naval Station, general medical exams made up 14 percent and 25 percent of their total visits, respectively. Eleven percent of the total visits for Sewell's Point are listed as unspecified administrative purpose. The general descriptive nature of a large number of visits coded in this manner may not offer administrators a clear understanding of what specific complexity or resources are needed. Naval Station has 3 percent of visits for special screening unspecified; a total of 5 percent is listed for back disorders. These five diagnoses describe 38 percent of Sewell's Point's visits and 35 percent of Naval Station's visits.

Little Creek and NTC also have the same top diagnosis code. Consultation for counseling constitutes 12 percent of Little Creek's visits and 14 percent of NTC's visits. General medical exams for adults and children, immunizations, and respiratory illness are common diagnoses for both clinic populations. The NTC sees such ailments as hypertension and screening for malignant neoplasm in the bladder. This may account for the more complex established office visit coding shown in the CPT chart resulting from their treatment of patients 65 and older. These five diagnoses describe 29 percent of Little Creek's visits and 33 percent of NTC's visits.

Table 11. FY 02: Sewell's Point and Naval Station—Top five diagnoses

Sewell's Point			Naval Station		
# of visits	Dx code & description	% of all visits	# of visits	Dx code & description	% of all visits
7,294	V70: Gen. med. exam	14	2,286	V70: Gen. med. exam	25
5,705	V68: Unspecified admin. purpose	11	267	724: Other disorders - back	3
3,060	V67: Follow-up exam	6	266	V82: Special screenings - unspecified	3
1,634	465: Acute upper respiratory infection	3	231	847: Sprains & strains - unspecified back	2
1,470	V72: Gyn. exams	3	226	465: Acute upper respiratory infection	2
19,163	50, 366 (total)	38	3,276	9,252 (total)	35

Table 12. FY 02: Little Creek and NTC—Top five diagnoses

Little Creek			NTC		
# of visits	Dx code & description	% of all visits	# of visits	Dx code & description	% of all visits
11,687	V65: Person seeking consultation for counseling - unspecified	12	3,857	V65: Person seeking consultation for counseling - unspecified	14
4,919	V20: Health supervision routine infant or child	5	1,651	401: Essential hypertension - unspecified	6
3,860	465: Acute upper respiratory infection	4	1,321	465: Acute upper respiratory infection	5
3,653	V72: Gyn. exams	4	1,005	V05: Vaccination and inoculation against single disease	4
3,572	V70 Gen. med. exam	4	925	V76: Screening for malignant neoplasm - bladder	3
27,691	93,915 (total)	29	8,759	26,920 (total)	33

Table 13. FY 02: Virginia Beach and Clairemont—Top five diagnoses

Virginia Beach			Clairemont		
# of visits	Dx code & description	% of all visits	# of visits	Dx code & description	% of all visits
3,556	465: Acute upper respiratory infection	5	5,257	465: Acute upper respiratory infection	8
3,145	V67: Follow-up exam	5	3,282	V20: Health supervision routine infant or child	5
2,863	382: Otitis media - unspecified	4	2,453	401: Essential hypertension - unspecified	4
2,730	V72: Gyn. exams	4	2,437	V72: Gyn. exams	4
2,609	V20: Health supervision routine infant or child	4	2,046	V67: Follow-up exam	3
14,903	69,271 (total)	22	15,475	62,143 (total)	25

Table 14. FY 02: NH Pendleton and NH Jacksonville—Top five diagnoses

NH Pendleton			NH Jacksonville		
# of visits	Dx code & description	% of all visits	# of visits	Dx code & description	% of all visits
20,151	V65: Person seeking consultation for counseling - unspecified	33	2,698	V65: Person seeking consultation for counseling - unspecified	5
2,463	V20: Health supervision routine infant or child	4	2,656	V22: Supervision of normal pregnancy	5
2,189	465: Acute upper respiratory infection	4	2,292	V68: Unspecified admin. purpose	4
2,128	V72: Gyn. exams	4	2,152	V70: Gen. med. exam	4
1,799	V22: Supervision of normal pregnancy	3	1,938	401: Essential hypertension - benign	3
28,730	61,590 (total)	47	11,736	58,421 (total)	20

For Virginia Beach and Clairemont, acute respiratory infection accounted for 5 percent and 8 percent of the visits, respectively. Both of these clinics had similar diagnoses—the only differences between them being Virginia Beach treating otitis media and Clairemont treating hypertension in the top five diagnoses, which may reflect their population demographics. Twenty-two percent of Virginia Beach's visits are described by these five diagnoses and 25 percent of Clairemont's visits.

The top diagnosis code for NH Camp Pendleton and NH Jacksonville was counseling. Both clinics had similar diagnoses with general medical exams, including woman and children health exams and maternity care. However, the percentage of visits these top five diagnosis codes encompassed was significantly different for each department. NH Camp Pendleton's top five codes described 47 percent of the visits, whereas NH Jacksonville's codes described 20 percent.

The mix and volume of diagnosis codes provides insight into the case mix or relative severity of illness for a clinic. Table 15 shows the most frequently occurring ICD-9 diagnosis coding for civilian family practice as recorded in the 2001 Physcape PracticeProfiler database. For family practice, the table shows that one-third of all diagnoses are captured by these ten diagnoses, with 22 percent for the top five diagnoses. The Portsmouth and San Diego clinics capture an average of 29 percent and 31 percent of visits for their top five codes, respectively. The three most frequently occurring diagnoses for civilian family practice patients are chronic diseases. The Portsmouth clinics treat respiratory illness, follow-up exams, and an assortment of other diagnoses, whereas the San Diego clinics also see respiratory illness, as well as hypertension and others. Both of these clinics tend to see patients with acute illnesses and preventive and wellness needs.

Table 15. Civilian family practice—top ten diagnosis codes

ICD-9	Description	Percentage of all codes
401	Essential hypertension	6
250	Diabetes mellitus	4
272	Disorder of lipoid metabolism	4
V70	General medical examination	3
780	General symptoms	3 (22 top five dx)
V04	Vaccination/inoculation against viral disease	2
V20	Health supervision of infant or child	2
V72	Special examination	2
789	Other symptoms involving abdomen and pelvis	2
461	Acute sinusitis	2
	Top 10 codes as a percentage of all diagnoses	34

PC clinic staffing and productivity

We will focus our analysis first on six naval branch medical clinics (NBMCs). These are the "matched" pairs described earlier—three associated with NMC San Diego and three associated with NMC Portsmouth. One clinic on each coast provides care mainly to active duty personnel. Another pair of clinics serves mainly active duty, dependents, and some retirees. The third pair of clinics has a military officer in overall charge, but both are managed and staffed by civilians, providing care almost exclusively to dependents and retirees.

Our analysis focuses on enrollment numbers, visits, staffing, measures of productivity, and cost at each clinic. We will also examine similar measures for two family practice clinics at naval hospitals with family practice graduate medical education (GME)—at NH Camp Pendleton and NH Jacksonville.

PC staffing

We've already described the demographics of the beneficiaries enrolled at each site; next, we will describe the number and type of providers who are available to treat them. We keep track of physicians and nonphysician providers, such as physician assistants (PAs) and nurse practitioners (NPs), using such measures as authorizations (i.e., billets), "bodies" or onboards, and full-time equivalents (FTEs). An authorization is really a funded requirement, but this requirement may not be filled at any given site. The bodies at a site do represent actual providers at the clinic, but this number can change month to month as people are reassigned. Further, it doesn't really tell us how much of their time is spent in the clinic actually providing patient care. Finally, there are FTEs, which, if measured accurately, would be best for measuring productivity based on time spent in patient care activities.

Even within the notion of an FTE, there are assigned FTEs (which conceptually should be close to the number of onboards) and available FTEs. The available time is based on the number of hours that providers supposedly spend in a particular clinic, as defined by a 3- or 4-digit MEPRS code within an MTF or branch clinic. As an example, the 3-digit MEPRS code BGA represents a family practice clinic within the MTF or branch clinic, and BHA represents a primary care clinic at these sites. As with most timekeeping activities, the system can be kept accurately or not, depending on how it is done and whether accuracy of the system is considered to be important.

Problems can also arise with the available FTE measure. Nonetheless, we feel that, among the various standard sources for measuring labor hours at an MTF or branch clinic, it probably is closest to what we want. We obtain clinic available FTEs and assigned FTEs from MEPRS as reported in the EAS IV system, but recognize that additional checks on the accuracy are required. We do this by reporting the clinic's best estimate of the actual labor employed in patient care activities. We can then compare our numbers with what the clinics believe to be the most accurate and substitute theirs when necessary.[4]

In addition to tracking physicians, PAs, and NPs, we also tracked whether the provider was in uniform, a federal civilian (i.e., GS), or on contract. As it turns out, at least for the San Diego clinics, this distinction was not very important (i.e., the providers were either mostly military at a site or mostly contract civilians, depending on the specific site). We define primary care as we indicated earlier—physicians, PAs, and NPs—in one of the clinics given in table 1 (i.e., BDA, BDB, BGA, BHA, BHB, or BHI).

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4. We considered using *assigned* FTEs because we were told that they may be more accurate and at least reflect who was assigned to the clinic. In reality, we saw little difference in the numbers reported between the two measures at most clinics. In fact, if anything, it seemed that the number of available FTEs was slightly higher than the number of assigned FTEs, and, because we're more concerned with underreporting than overreporting, that was important. Yet, at NTC, the number of assigned FTEs was almost 2.5 FTEs higher than the available value. We may have to revisit this issue later. Finally, one must use available FTEs for contract providers; there is no assigned number.

PC providers at NTC, Naval Station, and TOC Clairemont

Table 16 presents the provider FTEs at the three San Diego clinics as reported to us by the Director for Primary Care (DPC) in the San Diego area as well as from EAS IV in FY 2002. None of these FTE values are large, and the clinic-reported FTEs vary substantially with those we drew from EAS IV. For example, NTC reported 6.4 providers, whereas EAS IV reported 9.6 providers. Moreover, the data from EAS IV indicate that all are military providers, but the data from the clinic indicate that some are contractors. At the Naval Station, EAS IV reports only 4.4 FTEs, and the clinic reports 11.6 FTEs. Just as with NTC, the data from EAS IV indicate mostly military providers, but the data from the clinic show that a large portion of FTEs come from civilian providers. We believe the EAS IV value for this site is too low based on our discussions with clinic managers at the site. The last clinic, Clairemont, apparently had only contract civilians (8.0 FTEs using EAS IV and 9.5 using clinic data). During our visit in January 2003, information provided to us indicated that a total of 10.5 FTEs were on site. Therefore, we will also rely on the information that was provided to us by the DPC, indicating that about 9.5 FTEs and about two-thirds of Clairemont's providers are physicians. This percentage is higher than that at the Naval Station but lower than that of NTC.

Table 16. Comparison of primary care provider FTEs from EAS IV with clinic-provided data for three San Diego area clinics

	FTEs from EAS IV				FTEs based on information from clinics[a]			
Provider type	Physician	PA	NP	Total	Physician	PA	NP	Total
Naval Training Center[b]								
Military	7.6	1.7	0.3	9.6	3.6	1.2		4.7
Contract					1.7			1.7
Total	7.6	1.7	0.3	9.6	5.3	1.2		6.4
Naval Station[c]								
Military	2.3	1.5		3.8	1.4	2.1		3.5
Contract	0.6			0.6	7.1		1.0	8.1
Total	2.9	1.5		4.4	8.5	2.1	1.0	11.6
TOC Clairemont[d]								
Contract	6.4		1.6	8.0	6.1	2.0	1.4	9.5
Total	6.4		1.6	8.0	6.1	2.0	1.4	9.5

a. FTEs reported by the clinics represent staffing in July 2002.
b. Information from the DPC suggested that FTEs in January 2002 were 7.0. From the same source, FTEs in January 2002 were 6.6.
c. From the Director for Primary Care (DPC), FTEs in January 2002 were 13.8.
d. From the DPC, FTEs were 12.2 in January 2002 and 10.5 in December 2002.

Clearly, any analysis of productivity requires reliable measures of staffing. Unfortunately, the differences between the EAS IV and clinic data can be substantial, making it difficult for us to know which measure is more accurate. Based on our examination of the data and the discussions with the site personnel, we generally relied on their numbers (for the Naval Station and Clairemont). Because of our concern of undercounting provider staff, however, we relied on EAS IV for NTC's FTE count. We recognize that, if the EAS IV values are too high, this will reduce the values of the productivity measures of the site, but we believe that EAS IV tends to undercount FTEs, not overcount them. Table 17 shows the provider staffing figures we decided to use for these clinics in our productivity measures.

With these numbers, we can create our first measure of productivity associated with their clinic providers—the simple panel size for the average site provider. As we indicated earlier, in calculating the total number of providers, we add physicians and nonphysician providers. We also don't make any corrections for the demographic differences across the three sites. Our measure is the simple ratio of the number of enrollees to the number of primary care providers.

Table 17. Primary care provider FTEs at three San Diego area clinics

	Physician	PA	NP	Total
NTC	7.6	1.7	0.3	9.6
Naval Station	8.5	2.1	1.0	11.6
Clairemont	6.1	2.0	1.4	9.5

To put these numbers in context, panel sizes reported in the civilian sector can vary, but Kaiser-Permanente (Colorado) and Group Health report panel sizes of 2,200 equivalent lives per provider. In a recent CNA study,[5] the authors suggest that panel sizes at most Navy clinics should be in the range of about 1,200 to 1,500 per provider.

Table 18 shows the simple panel size (enrollees per provider). We've also shown the number of enrollees at each site (repeated from table

5. Daniel M. Harris and Stephen D. Tela, CDR, USN, *Organization for Optimization*, CRM D0007032.A1/Final, October 2002.

6) and primary care providers (repeated from table 17) from which the panel size has been calculated.

Table 18. Simple panel sizes for three San Diego clinics

Site	Enrollees	Providers	Enrollees/provider
NTC	8,674	9.6	904
Naval Station	5,041	11.6	435
Clairemont	16,690	9.5	1,757
Across all 3 sites	30,405	30.7	990

Based on the simple panel size for their enrollees, Clairemont appears to be closest to civilian (and Navy) benchmarks and Naval Station would be the furthest. The latter has a simple panel size that is about one-fourth that observed at Clairemont. The value for NTC is in between, but closer to Naval Station than it is to the Clairemont. Overall, the panel size for the three sites (i.e., 990) is lower than the value cited for civilian health care plans. The problem with this measure is that the sites provide care to beneficiaries other than its own enrollees—perhaps those who come to these sites for convenience or because they are in training at the base—or to nonenrollees. Before we can draw any conclusions, we must turn to more inclusive workload measures than what we've captured in table 18.

PC providers at Little Creek, Sewell's Point, and Virginia Beach

Table 19 presents the Portsmouth area clinic provider FTEs as reported by each clinic and as drawn from EAS IV. The provider staffs at Little Creek and Sewell's Point are larger than their comparable San Diego clinics (NTC and Naval Station, respectively). As for Virginia Beach, the provider staff is about the same size as Clairemont's. Comparing EAS IV and clinic-provided data, we see that FTEs from these data sources are similar for Virginia Beach. For Little Creek, we were provided data representing *bodies,* not FTEs, making it difficult to directly compare the two values. However, the FTEs that the clinic provided for civilian and contractor providers are larger than what we drew from EAS IV. Similarly, the data from Sewell's Point represent bodies for military and civilian providers, so they too are not directly comparable to the FTE data from EAS IV.

Table 19. Comparison of primary care provider FTEs from EAS IV to clinic-provided data for three Portsmouth area clinics

Provider type	FTEs from EAS IV				FTEs based on information from clinics			
	Physician	PA	NP	Total	Physician	PA	NP	Total
Little Creek[a]								
Military	4.2	3.1		7.3	6.0	3.0		9.0
Civilian (GS)	3.1	0.9	0.2	4.2	4.2	2.0	1.0	7.2
Contract	7.1		2.5	9.6	7.1		3.9	11.0
Total	14.4	4.0	2.7	21.1	17.3	5.0	4.9	27.2
Sewell's Point[a]								
Military	8.4	4.2	1.0	13.6	8.0	6.0	1.0	15.0
Civilian (GS)	3.9		1.3	5.2	6.0	3.0	4.0	13.0
Total	12.3	4.2	2.3	18.8	14.0	9.0	5.0	28.0
TPC Virginia Beach								
Contract	3.8	2.1	2.2	8.1	4.5		2.9	7.4
Total	3.8	2.1	2.2	8.1	4.5		2.9	7.4

a. The clinic data for military providers were apparently based on individuals at the site, not FTEs in the clinics.

Based on our visits to the clinics, discussions with clinic managers, and the fact that some clinic-reported figures are bodies not FTEs, we base our analysis of productivity on the EAS IV data. In the case of Virginia Beach, one chart provided to us indicated the 7.4 FTEs reported in the table. But, from other information we were given, it appears that the FTE count would be somewhere between 8 and 9. Thus, our estimate of 8.1 seems reasonably close. Table 20 shows the provider staffing figures we use when developing our productivity measures.

Table 20. Primary care provider FTEs at three Portsmoutha area clinics

Site	Physician	PA	NP	Total
Little Creek	14.4	4.0	2.7	21.1
Sewell's Point	12.3	4.2	2.3	18.8
Virginia Beach	3.8	2.1	2.2	8.1

We can also examine their simple panel sizes, again based on the number of enrollees and primary care providers. Table 21 presents these numbers, together with their computed panel size. As before, the civilian clinic has the largest simple panel size, 2,222 per FTE, which is larger than at Clairemont. Sewell's Point had the lowest

panel size, under 1,000 per FTE. On average, across all three clinics, they fall right in the range suggested by the CNA study cited earlier.

Table 21. Simple panel sizes for three Portsmouth area clinics

Site	Enrollees	Providers	Enrollees/provider
Little Creek	29,137	21.1	1,381
Sewell's Point	16,936	18.8	901
Virginia Beach	17,999	8.1	2,222
Across all 3 sites	64,072	48.0	1,335

Support staff at NTC, the Naval Station, and Clairemont

It takes more than providers (i.e., physicians, PAs, and NPs) to manage and provide the primary care services required every day for local enrollees and other beneficiaries. In addition to the providers are a whole range of support personnel, including

- Registered nurses
- Licensed practical nurses (LPNs), vocational nurses (LVNs)
- Nursing assistants
- Medical specialists and technicians
- Other paraprofessionals
- Administrative and clerical personnel.[6]

Table 22 shows one breakdown of these support personnel for the three San Diego area branch clinics in their primary care clinics. We list six categories of personnel for each of the military, civilian, and contract personnel categories, following the categories listed above. Some of these personnel are military officers, such as registered

6. In the next two tables, in which we list the available FTEs for these types of personnel, we're counting only those FTEs associated with the same primary care clinics that we considered for providers. In other words, we're not counting administrative FTEs who may work at the facility and whose time may be recorded in the "E" or "F" codes.

nurses, but most of those who are listed as other paraprofessionals, administrative, or clerical appear to be enlisted.

Table 22. Primary care support staff FTEs at three San Diego area clinics

	Registered nurses	LPNs/LVNs	Nursing assistants	Other paraprofessionals	Clerical	Other admin.
			NTC			
Military	1.4			14.2		
Civilian						
Contract	2.1	0.2	0.7	2.8	5.2	1.2
Total	3.5	0.2	0.7	17.0	5.2	1.2
			Naval Station			
Military	0.8			25.5		0.4
Civilian		0.9			0.9	
Contract						
Total	0.8	0.9		25.5	0.9	0.4
			TOC Clairemont			
Contract	6.2	1.6	5.5	2.5	3.6	

According to our calculations of FTEs at each site, NTC has a total of about 28 support personnel, most of which about 17 FTEs) are other paraprofessionals. There's a total of about 4.5 FTE nurses or nursing assistants and almost 6.5 administrative or clerical personnel. At the Naval Station, we count a large number of other paraprofessionals, but only a few in the other categories, including nurses or administrative/clerical personnel. Whether this indicates truly different staffing between NTC and the Naval Station, or simply poor reporting at one or both, is hard for us to say. Finally, at Clairemont, there seems to be more balance across these various categories: about 6 registered nurses, almost 2 LPNs or LVNs, 5.5 nursing assistants, 2.5 other paraprofessionals, and 3.6 clerks.

Support staff at Little Creek, Sewell's Point, and Virginia Beach

Table 23 presents the FTEs for other primary care personnel at the three Portsmouth area branch clinics. These clinics are larger, both in terms of the number of enrollees and providers, and the numbers of support personnel are larger as well. Little Creek has a total of 56 support personnel, with about 15 registered nurses or LPNs/LVNs,

with another 11 nursing assistants. Sewell's Point has fewer nurses but more paraprofessionals, all enlisted personnel. The overall numbers, as well as the number of administrative/clerical personnel, are very similar to what we found at Little Creek. The TPC at Virginia Beach has a similar number of contract support personnel to what we observed at the TOC Clairemont, but about 4 FTE military support personnel, mostly in the paraprofessional category. Virginia Beach has a total of about 12.3 nurses and nursing assistants compared to about 13.5 at Clairemont.

Before we leave this section, it might be useful to summarize what we found for all six clinics in terms of their support personnel. It's difficult to know how to trade off an additional registered nurse versus a clerk or nursing assistant, but one summary measure showing how they all compare might be the ratio of support personnel to providers. Table 24 presents the actual FTE counts for both staffing values and the ratio for each site. They appear to be fairly similar: the ratios range from 2.4 at Clairemont to 2.9 at NTC, all within a fairly tight range.

Table 23. Primary care support staff FTEs at three Portsmouth area clinics

	Registered nurses	LPNs/LVNs	Nursing assistants	Other paraprofessionals	Clerical	Other admin.
Little Creek						
Military	1.5			22.2	1.6	0.3
Civilian	5.0	2.7		0.3		
Contract	3.7	2.1	11.0	3.1	2.7	
Total	10.2	4.8	11.0	25.6	4.3	0.3
Sewell's Point						
Military	1.6			38.2		1.0
Civilian	8.8	0.9			1.6	1.9
Contract	0.2	0.3				
Total	10.6	1.2		38.2	1.6	2.9
Virginia Beach						
Military	0.6			3.5		
Contract	7.3		4.4	3.3	2.1	0.3
Total	7.9		4.4	6.8	2.1	0.3

Table 24. Support to provider ratios at six clinics

Characteristic	NTC	Little Creek	Naval Station	Sewell's Point	Clairemont	Virginia Beach
Support personnel	27.8	56.2	28.5	54.5	19.4	21.5
Providers	9.6	21.1	11.6	18.8	8.0	8.1
Ratio	2.9	2.7	2.5	2.9	2.4	2.7

PC workload and productivity

The simple panel size is one measure of productivity, but probably not a very good one, when other clinic enrollees and nonenrollees make up a significant portion of the facility's workload. Those clinics on large naval bases, such as at the Naval Station or Sewell's Point, have a large transient population of sailors who may be at the base for training or other reasons that keep them there for a relatively short period of time. In this section, we explore other measures that describe the work undertaken by the primary care clinics.

Measuring workload

The previous section gave information on the enrollees of six primary care clinics as well as their number of primary care providers' FTEs. But, we've also argued that one often-used measure of productivity for a clinic or health care system—its panel size—is insufficient when there are so many other beneficiaries to whom the clinics provide care. Now we focus on (1) the sites' enrollees visits to other clinics and MTFs and (2) the visits provided at these clinics to other enrollees and nonenrollees. Then, we can obtain a clearer picture of the entire workload of the clinic as well as the productivity of the providers.

We use several measures in this section to understand the work the clinic performs. One is, of course, the simple notion of an outpatient visit. Even this measure, however, is not completely straightforward and must be defined.[7]

7. In July 2003, the M2 began reporting outpatient *encounters* instead of outpatient *visits*. The change was made not because of any significant change in the definition of an outpatient visit but to anticipate future changes associated with inpatient reporting of provider encounters with patients, so we will continue to refer to outpatient visits in this report.

We will also examine the relative value units discussed earlier in the paper as a measure of the complexity or intensity of the outpatient visits provided at the site or to the individual. In a later section, we'll examine the cost of the visit as defined by the average cost of the visit. Cost is important but controversial within the direct care system. Unlike the civilian world, where the price paid for the visit can usually be ascertained from the claim, the cost must be determined by allocating the individual elements of manpower, capital, materials and other inputs required for the patient to receive his or her required level of services. We'll describe in that section our method for deriving appropriate cost measures.

The practice of counting visits is also subject to some controversy because not all visits are "countable" as currently defined for the World-wide Workload Report (WWR). According to TMA's definition of a countable visit, it is based on an algorithm that combines characteristics of the provider, work center, E&M procedure code, and other CPT codes to predict whether the MTF coded that appointment type as countable in CHCS. It is considered the "gold standard" for ambulatory workload and is probably most analogous to visits as recorded by civilian providers. Although the percentage of countable visits to noncountable visits varies from site to site, about 90 percent of all visits are considered countable. Further, there are different kinds of visits—appointments kept, walk-ins, sick call, and telephone consults. The latter can be countable when the provider feels it requires enough of his or her time and expertise.

Table 25 presents the various appointment types for the three Portsmouth clinics, as well as their average RVU. The majority of visits in all three sites are scheduled appointments, making up 57 percent of all Little Creek appointments, but over 90 percent of Virginia Beach's appointments. There are few, if any, sick call appointments, some walk-ins, particularly at Sewell's Point, and some telephone consults. The latter constitutes almost 18 percent of all Little Creek appointments, but only 8 and 6 percent, respectively, of the appointments at Sewell's Point and Virginia Beach. In terms of RVUs, there isn't a large difference in complexity between scheduled appointments and walk-ins, with walk-ins a bit higher, possibly because they include many

physical examinations. Not surprisingly, telephone consults have a relatively low RVU when compared to other types of appointments.[8]

Table 25. Visits, by appointment type, at three Portsmouth area clinics

Appointment type	Percentage	RVU
Little Creek		
Appointment schedule	73.0	0.96
Walk-in	8.9	1.04
Sick call	0.3	0.67
Telephone consult	17.9	0.24
Sewell's Point		
Appointment schedule	56.6	0.98
Walk-in	35.0	1.46
Sick call	~0.0	0.88
Telephone consult	8.4	0.37
Virginia Beach		
Appointment schedule	90.2	0.79
Walk-in	3.8	0.66
Sick call	0	N/A
Telephone consult	5.9	0.25

The next issue related to measuring visits is, Which one to use? There are several possibilities. We've just argued for using one based on the notion of a countable visit, which itself is based on an adjustment designed to make the totals close to the official numbers presented in the WWR. In this analysis, we rely on the counts of visits drawn from the SADR, not MEPRS or the WWR directly. We do this because we also require additional details not found in the MEPRS or WWR files (at least as reported in the M2).

If we rely on the visit counts from the SADRs, we still have to determine which measure to use. There are two possibilities—the raw counts and the *completed* (or total) counts, based on completion factors determined by TMA. The issue of which measure to use is an

8. If anything, it's somewhat surprising that a telephone consult has a positive RVU at all. In the CMS spreadsheet linking the procedure code to the RVU "score," a telephone consult has an RVU value of 0.00.

important one because it will affect almost of our productivity measures as well as the average cost of a visit.

Table 26 presents a comparison of primary care visit counts for the six clinics using five different possible values. The first three were derived from the SADR records for the specific primary care clinics of interest, the fourth from the WWR, and the fifth from MEPRS, all for FY 02 from the M2. With one exception, Sewell's Point, the WWR and MEPRS counts are very similar. We don't know why the numbers for Sewell's are so different. The table shows the differences between the raw and total SADR counts. We present two raw counts, the first based on the countable visit algorithm used in the M2, which (as we saw in the previous table) includes telephone consults. The second raw count includes visits, regardless of whether "countable," but now excluding telephone consults. For at least four of the six sites, the *total* measure of visits is very close to the WWR counts (and, therefore, close as well to the MEPRS counts). With the other two sites, NTC and Sewell's Point, the total is reasonably close—about 4 percent less than the WWR for the former and about 3 percent higher for the latter. Nonetheless, because of the uncertain nature of the completion factors used by TMA to take the raw counts to completion, we use the definition of raw, countable visits (i.e., column 3) when we present our data on outpatient workload.

Table 26. Visit counts for six clinics, five different measures

	SADR				
Site	Total	Raw[a]	Raw[b]	WWR	MEPRS
San Diego clinics					
NTC	41,119	37,242	33,456	42,779	42,600
Naval Station	45,396	36,400	43,627	45,332	45,305
TOC Clairemont	75,795	62,961	60,961	75,724	75,038
Portsmouth clinics					
Little Creek	121,273	115,479	100,269	121,149	121,066
Sewell's Point	110,992	100,104	93,348	107,793	99,635
TPC VA Beach	76,334	67,013	65,338	76,432	76,376

a. Raw counts of *countable* visits, includes telephone consults.
b. Raw counts of *all* visits, excludes telephone consults.

Civilian benchmarks for visits and RVUs

Before we examine some output measures drawn from each clinic, we provide a few more civilian benchmarks that can be used for comparison purposes with the various measures of workload and productivity that we derive for each clinic. These measures were derived from survey information obtained by the Medical Group Management Association (MGMA). We took their numbers for family practice, with and without obstetrics (OB) encounters, as representative of primary care providers observed in the various clinics. We assume that the FP values without OB are representative at the primary care clinics and the FP values with OB are representative of the family practice clinics at Camp Pendleton and Jacksonville. We provide numbers in table 27 for median ambulatory encounters (visits), median (work) RVUs, and then the average RVU per visit calculated from those values.

Table 27. MGMA median values from their 2002 report[a]

	Visits	RVUs	RVU/visit
FP without OB	4,451	3,892	0.88
FP with OB	3,940	4,169	1.06

a. From their Physician Compensation and Productivity Survey: 2002 report based on 2001 data.

We should also point out that in our use of the RVU, we rely on what is called the *simple* RVU from the M2 because that is what is reported for purchased care visits. The difference between the simple and adjusted RVU (which is available for direct care visits) is the way that the RVU score is applied to the various procedures on the record. By score, we mean the work RVU value assigned to that E&M code or that CPT. The adjusted score calculates an overall visit score based on assigning the procedure with the highest value a weight of 100 percent and all other procedures a weight of 50 percent. The simple RVU assigns a weight to all procedures (including the E&M code) of 100 percent. In other words, there is no discounting of less complex procedures. In reality, the difference between the two values is usually fairly small.

PC enrollee workload

From here on, our counts of visits represent *raw,* countable visits. We'll begin by examining the number and complexity of the primary

care visits for each site's enrollees. The sites' enrollees are obviously an important group of "customers" at a clinic, but the level of importance varies according to the percentage of care enrollees receive at their enrollment site. The next two tables show where enrollees received their care during FY 2002.

First, table 28 breaks down the primary care visits of the three San Diego clinics' enrollees into four components: visits to the clinic at which they enrolled, visits to NMC San Diego, visits to other clinics, and visits to the network (i.e., purchased care visits).

Table 28. Visits and RVUs for enrollees at three San Diego clinics

	Visits		RVUs		
	Number	Percent	Number	Percent	RVU/visit
NTC					
NTC	24,326	81.0	18,825	76.7	0.77
NMC San Diego	460	1.5	364	1.5	0.79
Other clinics	4,903	16.3	5,001	20.4	1.02
Network	364	1.2	333	1.4	0.91
Total	30,053	100.0	24,524	100.0	0.82
ER[a]					
At NMC	311		258		0.83
Network	206		333		1.62
Naval Station					
Naval Station	7,451	56.5	8,220	59.8	1.10
NMC San Diego	73	0.6	59	0.4	0.81
Other clinics	5,636	42.7	5,432	39.5	0.96
Network	39	0.3	43	0.3	1.10
Total	13,199	100.0	13,754	100.0	1.04
ER					
At NMC	102		84		0.82
Network	63		98		1.56
Clairemont					
Clairemont	51,573	94.0	31,879	92.0	0.62
NMC San Diego	1,157	2.1	902	2.6	0.78
Other clinics	1,316	2.4	1,149	3.3	0.87
Network	824	1.5	721	2.1	0.88
Total	54,870	100.0	34,652	100.0	0.63
ER					
At NMC	541		496		0.92
Network	573		984		1.72

a. All ER visits in this table, whether at the local medical center or the network, had a provider specialty code listed that indicated a primary care provider was seen.

We had to make a few other assumptions to determine the number of purchased care visits. First, there are no 3-digit MEPRS codes, so we rely on the provider specialty (specifically, general practice, family practice, pediatrics, PA, and NP) to determine, or at least approximate, the number of primary care visits received outside the direct care system. Second, we rely on the place-of-service variable and count visits to such settings as a doctor's office, an outpatient clinic or hospital, an ambulatory surgery center, state/local public health clinics, and so on. We have not counted any visits to an MTF, which, given that they appear on the noninstitutional HCSR, refer to resource-sharing visits.

Table 28 shows not only primary care visits, but also what we call primary care ER visits. Our definition of this type of visit is that the place of service was recorded as a hospital emergency room and the provider was one of our primary care specialties, as listed in the footnote. By showing all of these visits, both direct and purchased care, we can determine how much of the care and its complexity were provided to the site's enrollees for primary care.

As the table shows, there's quite a lot of variation in the percentage of care that the sites' enrollees receive at the clinic to which they enrolled. NTC's enrollees receive more than 80 percent of all their visits there, about 1.5 percent at NMC San Diego, about 16 percent at other clinics, and about 1 percent in the network. This is in contrast to the 57 percent of all visits for the Naval Station enrollees who receive care there and the 94 percent of visits received by Clairemont's enrollees at that facility. Very few visits were made at NMC San Diego by Naval Station enrollees (as we've seen, they are all active duty) and relatively few in the network. But, about 40 percent of their visits were provided by other clinics. This is not surprising for several reasons, including the generally accepted notion that active duty personnel care less about seeing their assigned primary care provider than being seen quickly, even if that means going to a different clinic. There's also the fact that they may deploy or be transferred elsewhere, and the enrollment site of record may lag their new enrollment site.

In terms of the complexity of their care, we can examine the percentage of (work) RVUs provided at the enrollment site as well as the RVU

per visit at all of the four sites. For example, NTC provided 81 percent of the primary care visits, but about 77 percent of the total RVUs. They received only 1.5 percent of their RVUs at the medical center, but 20 percent at other clinics, and about 1.4 percent in the network.

The percentages are in line with the RVUs per visit. For all NTC enrollees, this ratio is about 0.82, slightly higher than received at NTC or at the medical center, but lower than care received at other clinics or at civilian facilities.

At the Naval Station, the complexity of the average visit is actually a bit higher than the average, although slightly below the few purchased care visits. Overall, the average complexity for these enrollees, almost all active duty, is higher than for NTC enrollees.

The lowest recorded complexity is observed for Clairemont enrollees. It averages 0.63, well below the Naval Station and below that at NTC. The value is highest when their enrollees went to other clinics for care. We'll need to keep these values in mind when examining site productivity.

Note that we've also provided emergency room visits, both to the local naval medical center (which, in table 28, means to NMC San Diego) or to the emergency room at local civilian hospitals. The ER visits shown in this and the next table refer only to those visits when a "primary care" provider was seen. We recognize that this alone doesn't mean that the visit was for primary care in the sense that a routine visit might be. But, there is the question of whether DOD enrollees rely on the emergency room more than other civilian users of health care. For the San Diego area enrollees shown in the tables, there isn't that much use of the ER. However, the difference in average RVU may be an indication that visits to the MTF for emergency care are not much different in complexity than visits for routine care. The average RVU for enrollees using civilian facilities is higher, indicating perhaps that the visit was, indeed, for more acute care.

Table 29 shows the results for the Portsmouth area clinics. As we indicated before, these tend to be larger clinics, serving more enrollees and providing more total visits. In terms of the complexity of care provided, the clinics seem fairly similar. The most complex services were provided at Sewell's Point, with an average of 0.97, and the lowest is

Virginia Beach, with an average of 0.78. The average RVU per visit for network visits is similar to visits either at the enrollment site or other clinics and MTFs, but one striking difference is that the medical center at Portsmouth provides more complex care as measured by the average RVU. One might have expected that, but in San Diego, visits to the medical center were not (at least as reported) much more complex in nature.

Table 29. Visits and RVUs for enrollees at three Portsmouth clinics

	Visits		RVUs		
	Number	Percent	Number	Percent	RVU/visit
Little Creek					
Little Creek	90,334	88.2	75,739	85.7	0.84
NMC Portsmouth	2,950	2.9	4,205	4.8	1.43
Other clinics	6,544	6.4	6,536	7.4	1.00
Network	2,607	2.5	1,859	2.1	0.71
Total	102,435	100.0	88,340	100.0	0.86
ER[a]					
At NMC	3,015		2,707		0.90
Network	4,164		6,341		1.52
Sewell's Point					
Sewell's Point	44,977	84.8	44,539	84.9	0.99
NMC Portsmouth	937	1.8	1,168	2.2	1.25
Other clinics	6,533	12.3	6,303	12.0	0.96
Network	588	1.1	443	0.8	0.75
Total	53,035	100.0	52,453	100.0	0.99
ER					
At NMC	1,774		1,556		0.88
Network	1,204		1,789		1.49
Virginia Beach					
VA Beach	60,763	89.9	46,398	86.9	0.76
NMC Portsmouth	2,305	3.4	3,287	6.2	1.43
Other clinics	2,767	4.1	2,267	4.3	0.82
Network	1,751	2.6	1,442	2.7	0.82
Total	67,586	100.0	53,394	100.0	0.79
ER					
At NMC	1,590		1,511		0.95
Network	3,182		5,140		1.62

a. All ER visits in this table, whether at the local medical center or the network, had a provider specialty code listed that indicated a primary care provider was seen.

In terms of where the visits take place, all three sites' enrollees obtain most of their visits at their enrollment site, between 85 and 90 percent at the three sites. The amount of care received at the medical center, other clinics, or through the network varies across the sites. The medical center provides 1.8 percent of the visits to Sewell's Point enrollees, 2.9 percent for Little Creek enrollees, and more than 3 percent for Virginia Beach enrollees (generally higher percentages in terms of RVUs). We do, however, see a higher percentage of visits to the network, at least for enrollees at Little Creek when compared to NTC enrollees, and for Sewell's Point when compared to Naval Station enrollees. This may be surprising, and we explore this further in a later section. In addition, the number of visits to emergency rooms seems high, especially at civilian facilities. The pattern in emergency room RVUs is similar to what we observed in San Diego—average RVUs at NMC Portsmouth in line with visits to other direct care clinics, but much higher RVUs for ER visits at civilian facilities.

PC site workload

Each site provides care to many beneficiaries other than its own enrollees. To measure the full extent of the productivity of a site's providers, we must take this workload into account as well. Table 30 presents the full workload of the San Diego area's clinics, measured by the number of visits and RVUs provided to site enrollees, other enrollees, and those beneficiaries who aren't enrollees.

There are several striking differences across the clinics. About 82 percent of the workload at Clairemont is for its own enrollees. Almost two-thirds of the primary care outpatient visits at NTC were for their enrollees, but only about a fifth at the Naval Station were for their enrollees. In other words, almost 80 percent of the workload undertaken by primary care providers at the Naval Station were not for its own enrollees. This is important to remember when trying to calculate a reliable measure of the panel size for enrollees.

Table 31 presents similar, though not quite as dramatic, results for the Portsmouth clinics. Little Creek provides more than three-quarters of its visits to its own enrollees, with about 7 percent to other sites' enrollees, and 16 percent to nonenrollees. Sewell's Point provides less than half of its visits to its own enrollees, relatively low when compared to other Portsmouth-area clinics, but more than twice the

percentage as the Naval Station. More than 90 percent of Virginia Beach's visits were for their enrollees, with the rest split more or less among other enrollees and nonenrollees.

Table 30. Enrollee and nonenrollee visits at three San Diego area clinics

Beneficiary	Visits		RVUs	
	Number	Percent	Number	Per visit
NTC				
Site enrollees	24,326	65.3	18,825	0.77
Other enrollees	7,739	20.8	6,504	0.84
Nonenrollees	5,177	13.9	4,291	0.83
Total	37,242	100.0	29,621	0.80
Naval Station				
Site enrollees	7,451	20.5	8,220	1.10
Other enrollees	16,693	45.9	19,287	1.16
Nonenrollees	12,256	33.6	14,610	1.19
Total	36,400	100.0	42,117	1.16
Clairemont				
Site enrollees	62,150	81.9	31,879	0.62
Other enrollees	2,969	4.7	1,965	0.66
Nonenrollees	8,419	13.4	5,361	0.64
Total	62,961	100.0	39,205	0.62

Table 31. Enrollee and nonenrollee visits at three Portsmouth area clinics

Beneficiary	Visits		RVUs	
	Number	Percent	Number	Per visit
Little Creek				
Site enrollees	90,334	78.2	75,739	0.84
Other enrollees	7,815	6.7	7,092	0.91
Nonenrollees	17,330	15.0	15,543	0.90
Total	115,479	100.0	98,374	0.85
Sewell's Point				
Site enrollees	44,977	44.9	44,539	0.99
Other enrollees	17,800	17.8	22,334	1.25
Nonenrollees	37,327	37.3	45,963	1.23
Total	100,104	100.0	112,836	1.13
Virginia Beach				
Site enrollees	60,763	90.7	46,398	0.76
Other enrollees	2,481	3.7	1,947	0.78
Nonenrollees	3,769	5.6	2,930	0.78
Total	67,013	100.0	51,275	0.77

In terms of RVUs, in either table, there is not that much difference in the complexity of care provided to enrollees or nonenrollees (with the possible exception of Sewell's Point). The fact that the relative percentages are similar to the percentages for visits indicates that the complexity doesn't vary much whether the beneficiary is a site enrollee, another site's enrollee, or a nonenrollee. There are, however, some differences across sites. The Naval Station and Sewell's Point provided, on average, a slightly more complex service per visit than the other sites. NTC and Little Creek had values remarkably similar, and Virginia Beach provided a somewhat more complex service than did Clairemont, but both sets of RVU values were slightly less than the other four sites.

Correcting for demographic differences across enrollees

Tables 6 and 7 presented some of the clinic enrollees' characteristics—the numbers of active duty and non-AD and their age and gender. This provides some useful information because demographics will generally lead to different health care needs. Older populations usually require more care than younger ones. However, when provided simply in terms of differences in characteristics, it's difficult at best to determine what that really means for resource use at a given site.

One way to summarize the demographic differences across clinics is through the notion of "equivalent lives." The calculation of an equivalent life begins by modeling a given population's expected resource use based on its demographic characteristics. It uses the results to normalize each enrollee's expected relative resource use across age groups, gender, sponsor service, marital status, and beneficiary category. Thus, if the "normalized" value (which is equal to 1) is based on a reasonably healthy 20-year-old active duty male, the end result is that a 40-year-old female may have an equivalent life that is greater than 1, but a healthy 12-year-old may generate an equivalent life that is less than that of this normalized DOD beneficiary.[9] Our immediate

9. In a later section of this research memorandum, we correct for the enrollees' demographic characteristics when examining differences in the demand for care as well as enrollees' relative use of network and other civilian facilities and providers for care under revised financing.

use of the equivalent lives concept will be for calculating enrollee panel sizes at each clinic, but with adjustments made for differences in demographics and the care received and provided only at the site at which they were enrolled.

We base our method on the RVUs required by enrollees at each site across the MHS. In other words, we estimate through statistical methods the amount of care received in the system for all enrollees, which then allows us to estimate what that implies for any given group of enrollees based on their specific characteristics. That allows us to derive an overall measure of the resource use for the clinics' own enrollees relative to the overall average.

Our focus concerns the amount of primary care *resource intensity,* but we also present non-primary-care resource intensity. This measure is interesting in its own right, but it can also serve as a check on the adequacy of the measure we derive for primary care. Our expectation is that the resource intensity of non-primary care is higher than for primary care across most age-gender categories.

To estimate the necessary relationships, we used the 5-percent sample of all DOD beneficiaries that we described earlier in the data section. Linked to this random sample of more than 400,000 DOD beneficiaries were their claims data, both inpatient and outpatient, direct and purchased care. From this, we calculated our own version of the RVU for outpatient visits.[10]

We create resource intensity factors for several demographic groups (some are aggregates of the others)—all enrollees, those on active duty, male and female enrollees, and enrollees within the three age groups we presented in tables 6 and 7 (specifically, less than 18, 18 to

10. Our measure of the RVU is the adjusted work value, not the simple value we described earlier. It takes the individual E&M codes and procedure codes and weights the most *intense* one (i.e., the one with the highest individual work RVU score) by 100 percent, all others by 50 percent. The measure pertains only to the visit to a provider, and doesn't include any laboratory or ancillary procedures that may have been part of the visit. Note also that the weighting procedure reduces the calculated adjusted RVU when compared to the simple RVU value.

64, and 65 and above). First for primary care, we derived an overall estimate of the average number of RVUs across the MHS to be about 2.35 per enrollee per year. Table 32 provides a further breakdown for males and females across the various age groups as well as for all enrollees and the active duty.

Table 32. Relative resource intensity for primary care

			Non-AD		
	All enrollees	Active duty (AD)	Less than 18	18 to 64	65 and older
Male	0.88	0.74	1.13	0.77	0.88
Female	1.12	1.44	1.07	1.11	1.05

Relative to the overall average of 1, the results suggest that males require significantly less care than females, that male active duty require less than the overall average for males, but that female active duty require more care than the overall average for females. Somewhat surprising are some of the results for the non-AD. Male children, as defined by those under 18, are above the average, as are female children, but the latter requires less care than males. We found that infants, at least when defined by individuals whose age was reported as 0, require a relatively high number of resources (again, based on the primary care RVU). Perhaps even more surprising are the results for the oldest population reported here, the over-65 population. The male population requires about 12 percent less care than the overall population, and the female population requires about 5 percent more. But, these values seem low for the groups who generally require the most care.

Perhaps one reason why the over-65 population's values seem relatively low is that, to the extent that Medicare alone provides some of the services, our data may not capture all the care they received. It may also be the case that they require relatively more non-primary-care services. Table 33 presents the total resource intensity values for the various demographic groups. We calculate an overall MHS average RVU value, both primary care (PC) and non-PC, of about 7.96 (implying a non-PC value of about 5.6 RVUs per person).

Table 33. Relative resource intensity for all care

	All enrollees	Active duty (AD)	Non-AD		
			Less than 18	18 to 64	65 and older
Male	0.90	1.00	0.64	0.90	2.20
Female	1.10	1.81	0.57	1.25	2.05

Once non-PC is included, the results look more like what we might expect. Children require less resource-intensive care and older enrollees require significantly more. It's a bit surprising that older female enrollees require somewhat less care than older males, but the values are close and probably reflect similar amounts of all care. Active duty males are right at the overall MHS average, but female active duty personnel are much higher.

In our work, we derive these values, when sample size permits, for each clinic and MTF in our study. To show overall values for each site, table 34 presents the resource intensity averages for each site—primary and all care. The various matched clinics can be compared to determine what the implications will be for the equivalent lives calculations. One interesting finding is how close the enrollees are at NHs Camp Pendleton and Jacksonville.

Table 34. Average resource intensity values, by site for outpatient care

	Primary care	All care
NTC	0.91	1.01
Naval Station	0.75	0.93
TOC Clairemont	1.01	0.79
Little Creek	1.10	0.87
Sewell's Point	0.99	0.99
TPC VA Beach	1.10	0.82
NH Camp Pendleton	1.10	0.96
NH Jacksonville	1.10	0.95

The last set of findings in this section pertains to the values of the equivalent lives at each of the primary care clinics. Table 35 shows the number of equivalent lives in each age and gender category for the three San Diego clinics, and table 36 shows the analogous values for the three Portsmouth clinics.

Table 35. Equivalent lives estimates at three San Diego area clinics

	Female	Male	Total
NBMC Naval Training Center			
Active duty (AD)	562	1,923	2,485
Non-AD			
<18	714	894	1,608
18 to 64	2,274	475	2,749
65 and over	547	528	1,075
Total	4,097	3,820	7,917
NBMC Naval Station			
AD	931	2,904	3,835
Non-AD			
<18	0	0	0
18 to 65	1	2	3
65 and over	0	0	0
Total	932	2,906	3,838
TOC Clairemont			
AD	27	0	27
Non-AD			
<18	4,048	4,217	8,265
18 to 64	7,094	1,524	8,618
65 and over	12	6	18
Total	11,181	5,747	16,928

Table 36. Equivalent lives estimates at three Portsmouth area clinics

	Female	Male	Total
NBMC Little Creek			
AD	1,081	3,237	4,318
Non-AD			
<18	7,226	8,020	15,246
18 to 64	10,324	2,132	12,457
65 and over	21	6	27
Total	18,652	13,395	32,047
NBMC Sewell's Point			
AD	3,669	7,465	11,134
Non-AD			
<18	1,541	1,608	3,149
18 to 64	2,164	308	2,472
65 and over	1	0	1
Total	7,374	9,381	16,755

Table 36. Equivalent lives estimates at three Portsmouth area clinics (con-

	Female	Male	Total
TPC Virginia Beach			
AD	1	7	9
Non-AD			
<18	5,049	5,459	10,508
18 to 64	7,638	1,617	9,255
65 and over	5	0	5
Total	12,694	7,083	19,777

Calculating the *effective* panel size at the PC clinics

Tables 18 and 21 showed what we've called the simple panel size per primary care provider. Its calculation is simple and straightforward (at least when the data are available and reasonably accurate): the number of the site's enrollees divided by the number of primary care providers in carefully defined primary care clinics. As we said earlier, we count providers as the number of available FTEs for physicians, PAs, and NPs, military or civilian, in these specified clinics.

We've also indicated a few problems with this definition. First, the enrollees receive some of their care elsewhere. We've seen that for the six clinics of interest, the percentage of visits they receive at their own enrollment site varies from about 56 to 94 percent. In terms of the percentage of RVUs for enrollees provided at the enrollment site, the percentage varies from 60 percent to 92 percent. Second, the demographics differ across clinics: some provide care mainly to healthy active duty personnel, others provide care only to dependents and retirees. Third, the site's providers don't provide care to only these enrollees; they serve other sites' enrollees and nonenrollees as well. Thus, we need a method to examine productivity as measured by the site's care for its enrollees that takes account of their demographics as well as how much care the enrollees receive elsewhere.[11]

11. To do this, we rely on a method first developed by OASD/HA. They have estimates for parent MTFs, i.e., the hospital and all branch clinics. We're applying the approach to specific primary care clinics outside of the parent MTF.

The method begins with a site's enrollees and available FTEs, but then scales both appropriately by the number of equivalent lives for their population and the relative degree to which the site provides the care, respectively.

Because the FY02 purchased care visits now have an associated RVU, we can determine the total amount of outpatient primary care provided to a site's enrollees and then the percentage provided at the enrollment site. We use this percentage to scale the site's equivalent lives. Why? To the extent that equivalent lives normalize the care required based on the sites' specific characteristics, it provides a normalized number of enrollees for which the site provides care. On the other side, we have to scale the number of providers by the percentage of the care they provide to site enrollees, but not out of the total care the enrollees receive—much of which is received elsewhere. To do this, we use the percentage of RVUs the enrollees receive at the site. We can show this in four simple equations below:

Enrollees x primary care resource intensity = equivalent lives,
Equivalent lives x RVUs obtained at site = adjusted equivalent lives,
Site provider FTEs x RVUs for site enrollees = adjusted FTEs
Effective panel size = adjusted equivalent lives/adjusted FTEs.

Table 37 repeats the number of enrollees (from tables 6 and 7 for the San Diego and Portsmouth clinics, respectively), and then the adjusted values of the equivalent lives and FTEs. In the last row, we divide the adjusted equivalent lives value by the adjusted number of available FTEs to derive the effective panel size we impute to the site's primary care providers.

Table 37. Effective panel sizes, PC clinics

	NTC	Little Creek	Naval Station	Sewell's Point	Clairemont	Virginia Beach
Number of enrollees	8,674	29,137	5,041	16,939	16,690	17,999
Adjusted equivalent lives	6,078	27,477	2,294	13,966	15,574	17,186
Adjusted available FTEs	6.1	16.2	2.3	7.4	7.7	7.3
Effective panel size	996	1,691	1,013	1,882	2,016	2,345

How different are these panel sizes from those shown earlier (in tables 18 and 21)? In the San Diego area, NTC's panel size remains about the same (904 and 996, respectively), the Naval Station's goes up from 435 to 1,013, and Clairemont rises as well (from 1,757 to 2,016). In the Portsmouth area, Little Creek's panel size rises (from 1,381 to 1,691), Sewell's Point's more than doubles (from 901 to 1,882), and Virginia Beach's rises (from 2,222 to 2,345).

We observe the panel sizes increase sharply for the two mainly active duty clinics—the Naval Station and Sewell's Point. This may well provide a more accurate representation of the work they are really doing, but it may also reflect the need for still more verification of their patient care FTEs. For the civilian-run clinics, both Clairemont and Virginia Beach fall a bit from their simple panel sizes and are somewhat less than the value we provided earlier for some civilian plan, but well above the suggested values for Navy clinics. Finally, although the simple panel size calculations showed a higher value for Little Creek when compared to NTC, the values reverse when adjusted.

Measures of implied demand and provider productivity—PC clinics

In addition to calculating the panel sizes, we can derive other values of interest. Two useful examples represent the annual "demand" for care per beneficiary and the productivity per FTE. The demand can be measured by the number of visits or RVUs per enrollee at the enrollment site or at all sites where he or she received care. We can also examine the number of visits or RVUs per equivalent life. That has the presumed advantage of taking account of demographic differences across the sites' enrollees. If these last two measures focus on the enrollment site, we need to adjust the equivalent lives by the same adjustment factor we did earlier (i.e., by the percentage of RVUs received at the site for its own enrollees). Thus, there are several possible measures of demand we can examine.

Table 38 presents values of the visits and simple RVUs where we focus on the care provided to enrollees. The first two measures take the total number of visits and RVUs, both at the enrollment site and elsewhere (other clinics, the MTF, or purchased care) and divide by the

number of enrollees at that site. The next two measures examine the care provided to the enrollees only at that site and adjust the number of equivalent lives as before by using the percentage of total RVUs for the site's enrollees out of all of their RVUs.

Table 38. Demand measures, PC clinics for their enrollees, FY 2002

	NTC	Little Creek	Naval Station	Sewell's Point	Clairemont	Virginia Beach
Visits per enrollee[a]	3.5	3.8	2.6	3.3	3.3	4.0
RVUs per enrollee	2.9	3.4	2.8	3.3	2.2	3.3
Visits per adj. equivalent life[b]	4.0	3.3	3.3	3.2	3.3	3.5
RVUs per adj. equivalent life	3.1	2.8	3.6	3.2	2.1	2.7

a. All visits and RVUs pertain only to primary care, but include ER visits when seen by a primary care provider.
b. Represents visits by enrollees at their enrollment site.

The first two rows generally confirm that the total care required by the sites' enrollees are not dramatically different, especially for the matched sites on each coast. It does appear that sites with dependents and retirees have slightly higher numbers of visits per enrollee, although there's not a lot of difference in their required complexity of care. The number of RVUs per enrollee is lowest at Clairemont, with a value of 2.2, and highest at the three Portsmouth area clinics, with values a bit above 3.0. That's a difference, but the range is relatively narrow.

The third and fourth rows of the table show the results of correcting for demographic differences through the use of equivalent lives and adjusting for only the care provided at the enrollment site. There's little difference for most sites, but we still believe that it is worthwhile to adjust for differences in demographics and where enrollees receive their care.

We can calculate related productivity measures as well, such as the number of enrollee RVUs at the six sites provided by the sites' providers, the latter value adjusted by the same adjustment factor we used in table 38 (i.e., percentage of RVUs provided to the site's enrollees out of all RVUs provided at the site). As a simple and fairly standard

measure of the total productivity by the sites' providers, we can calculate the total number of visits per provider at each site.

Table 39 presents these three measures for each site. Once again, the results point the need to ensure that all FTEs providing care at each site are reporting accurately and are not underreported. But, assuming for now the accuracy of the staffing FTEs, all sites are reasonably productive, and some appear to be *very* productive. The number of RVUs per (adjusted) FTE is well above the benchmark at five of the six sites. In fact, it seems surprising that Virginia Beach's numbers of RVUs per provider are so high, given their low value per visit, but that's clearly outweighed by their extremely high count of visits per provider. Indeed, all sites are above the benchmark on this simple, yet potentially useful, measure.

Table 39. Productivity measures, PC clinics

	NTC	Little Creek	Naval Station	Sewell's Point	Clairemont	Virginia Beach
Enrollee RVUs per adj. FTE	3,086	4,662	3,631	6,002	4,127	6,330
All visits per total FTEs	3,879	5,473	3,138	5,324	6,627	8,273

FP clinics' staffing and productivity

We present the results for the two FP clinics in a separate section, although we will follow the same organizational structure for presenting results as we did for the six primary care clinics. The FP clinics are part of larger facilities and many of the providers offer care for beneficiaries at the MTF's inpatient facilities. In addition, the fully trained physicians and other staff are generally involved in the GME program offered to the interns and residents. GME also complicates many of the notions of workload and productivity because it takes time away from patient care by fully trained providers. It also means that some of this patient care is done by students. Panel sizes will differ across the type of provider, even by year of residency.

FP staffing

For each PC clinic, we rely on EAS IV for our FP staffing values. During our visit, Camp Pendleton seemed to be the only site that indicated that it took MEPRS accounting seriously (EAS IV is based on MEPRS). In fact, Camp Pendleton provided us its EAS IV numbers, which were essentially the same as ours. In addition, Camp Pendleton's Director for Medical Services provided a "snapshot" of both billets and bodies for specific months in FY01, FY02, and March 2003.

Table 40 shows the provider FTEs for the FP clinics at each facility. According to our calculated values from EAS IV, Camp Pendleton had 19.6 provider FTEs, although that number includes a total of 9.7 FTEs for interns and residents. At Jacksonville, the numbers are fairly close, with a total of 15.1 FTEs, the major difference due to fewer reported FTE residents. All of the reported FTEs at Jacksonville were military, but Camp Pendleton had a contract nurse practitioner.

Table 40. Family practice provider FTEs at two FP clinics

	Intern	Residents	Physicians	PAs	NPs	Total
Camp Pendleton						
Military	1.7	8.0	5.0	0.9	3.0	18.6
Contract					1.0	1.0
Total	1.7	8.0	5.0	0.9	4.0	19.6
Jacksonville						
Military	1.4	5.2	5.2	0.8	2.5	15.1

How did these numbers compare with what Camp Pendleton reported to us directly? Camp Pendleton's count of bodies for December 2002 lists 8.25 physicians (all FPs), 3 military NPs, 1 contract NP, 1 military PA, 13 interns, and 21 residents. Given that most of the interns' and residents' time would be in training, it would appear that these two sets of numbers are relatively close. The only real difference appears to be in the fully trained physicians—8.25 bodies and 5 FTEs. How much time did fully trained physicians report in supporting GME? The code here is a MEPRS "E" code, under GME support expenses, and totaled about 8 FTEs. In other words, there appear to be about 13 FTEs reported by physicians, which might include the one reported department head.

Turning to the support staff at both sites, we rely on EAS IV for those as well, with the same six categories as before. Table 41 presents the numbers drawn for the two sites. For Pendleton, we count a total of 44.2 support staff from EAS IV and could contrast that with a total of 38 staff that Pendleton reported, as of December 2002. At Jacksonville, the only information we have is what we obtained from EAS IV, and there we counted 31.3 FTEs.

Table 42 presents the ratio of support staff to providers , which is complicated by the presence of interns and residents. We've included their FTEs based on the amount of time recorded in the clinic. We're assuming that doesn't include their training time, but rather time fulfilling their role as providers, even though we realize they are probably always learning to some extent and don't have the experience of a fully trained physician or nonphysician provider. The ratio of

support staff to providers at Pendleton is 2.3 to 1, including interns and residents, and 4.5 if interns and residents are not included. At Jacksonville, these ratios are 2.1 and 3.7, respectively.

Table 41. FP support staff FTEs at two FP clinics

	Registered nurses	LPNs/LVNs	Nursing assistants	Other paraprofessionals	Clerical	Other admin
Camp Pendleton						
Military	5.9			16.6		0.6
Civilian	1.0	8.2			7.5	0.9
Contract			3.5			
Total	6.9	8.2	3.5	16.6	7.5	1.5
Jacksonville						
Military	3.5			13.5		0.4
Civilian	1.5	2.9		0.2	4.7	1.6
Contract			2.1		0.9	
Total	5.0	2.9	2.1	13.7	5.6	2.0

Table 42. Support-to-provider ratios at two FP teaching sites

	Camp Pendleton	Jacksonville
Support personnel	44.2	31.3
Fully-trained providers	9.9	8.5
Interns and residents	9.7	6.6
Ratio (excluding interns and residents)	4.5	3.7
Ratio (including interns and residents)	2.3	2.1

At this point, we haven't yet provided the simple panel sizes at each site. How to count interns and residents complicates this calculation. In other words, how should we count the students in the program in terms of the care they provide to beneficiaries? We were told at each site that interns and residents were given panel sizes, but the numbers were much reduced when compared with fully trained providers. Thus, at Jacksonville, a first-year student (i.e., an intern) was assigned a panel size of 120 (i.e., patients he or she was responsible for), a second-year (i.e., first-year resident) was assigned a panel size of 240, and a third-year student (i.e., second-year resident) was assigned a panel size of 360. Also, the fully trained providers spend a good portion of their time with the students, which was confirmed by the

number of FTEs in clinic (about 5 at both places) compared with the number of FPs on board (8+ at Pendleton and a similar number at Jacksonville). Therefore, there are at least two methods for determining the simple panel size. One is to follow the same technique as before, simply adding up all providers, but this time including the FTEs for interns and residents as well. The second method is to allocate enrollees to the students, using the panel sizes provided above, and then calculate the panel size for the remaining fully trained staff as before. We could only do this for Camp Pendleton, which provided its onboard staffing.

Table 43 presents these numbers, first by using all FTEs, called Method 1, and second by allocating panels to the onboard interns and residents and then allocating the remaining enrollees to the FTE providers (i.e., the FP, PAs, and NPs), which we call Method 2. Whether by coincidence or design, the values for at least the fully trained providers are close between the two methods. From here on in this paper, we plan to rely on the FTE values, including the interns and residents, as our counts of providers. It does seem to account for everyone's time, even taking into account the training offered by fully trained providers and received by the students.

Table 43. Simple panel sizes for two FP clinics

Site	Enrollees	Providers	Enrollees/ provider
Method 1			
Camp Pendleton (CP)	15,391	19.6[a]	785
Jacksonville	14,007	15.1	928
Method 2 (CP only)			
CP interns and residents	7,800	34[b]	229
CP FPs, PAs, and NPs	7,591	9.9	767

a. Method 1 relies on available FTEs from table 30.
b. Method 2 relies on actual numbers onboard for interns and residents, but FTEs for the fully-trained providers.

FP workload and productivity

Analogous to the PC clinics, we will focus on what we call enrollee workload and site workload at each of the FP clinics. Our earlier explanations of how we examined the work at the clinics still follows, so we can simplify our discussion in this section and just show the results. Before doing so, let's examine the counts of visits obtained from different sources. We continue to use the counts as obtained from the M2 under the designation of raw, countable visits. Table 44 compares the total counts against what was reported in the WWR (as shown earlier in table 4) and from MEPRS. The values from the WWR and MEPRS are quite close, but the raw counts from the M2 are less, by 4 or 6 percent at the respective sites. Nonetheless, we rely on the raw count variables for each site.

Table 44. Visit counts at FP clinics, three different measures

	Raw (from SADR)	WWR	MEPRS
Camp Pendleton	68,177	70,689	70,599
Jacksonville	68,812	73,370	73,658

Enrollee and site workload

Table 45 shows the results for visits and RVUs for the two clinics' enrollees. As we did earlier, we break down the enrollee visits into those made to the enrollment site, other direct care clinics, or MTFs and the network. Because these clinics are located within the MTF, we don't need a separate category for the local medical center as we did for the branch clinics.

In both cases, more than 96 percent of the enrollees' family practice visits were made at the respective FP clinic sites. The remaining visits were split between other direct care sites and the network. In terms of RVUs, both sites' enrollees' average RVUs per visit were at or just below 0.70, which was close to the average provided by the clinics to their enrollees. As we've seen, this is slightly below the benchmark we provided earlier of 1.08 for FPs with OB.

Table 45. Visits and RVUs at two FP clinics

	Visits		RVUs		
	Number	Percent	Number	Percent	Per visit
Camp Pendleton					
Camp Pendleton	58,405	96.9	41,858	96.4	0.72
Other clinics	1,013	1.7	791	1.8	0.78
Network	844	1.4	784	1.8	0.93
Total	60,262	100.0	43,433	100.0	0.72
Jacksonville					
Jacksonville	54,920	97.7	38,459	97.2	0.70
Other clinics	722	1.3	570	1.4	0.79
Network	569	1.0	538	1.4	0.95
Total	56,211	100.0	39,567	100.0	0.70

Turning next to the total clinic workload, table 46 shows all of the sites' visits, including to other sites' enrollees and nonenrollees. Pendleton provides much more of its visits and RVUs to its own enrollees than does Jacksonville, about 86 percent versus about 80 percent. Most of the difference results from visits by nonenrollees to the clinic at Jacksonville. The overall RVU per visit is 0.72 at Camp Pendleton and 0.70 at Jacksonville, essentially identical to what each provides its own enrollees.

Table 46. Enrollee and nonenrollee visits at two FP clinics

	Visits		RVUs	
	Number	Percent	Number	Per visit
Camp Pendleton				
Site enrollees	58,405	85.7	41,858	0.72
Other enrollees	3,033	4.5	2,567	0.85
Nonenrollees	6,739	9.8	4,901	0.73
Total	68,177	100.0	49,326	0.72
Jacksonville				
Site enrollees	54,920	79.8	38,459	0.70
Other enrollees	3,432	5.0	2,858	0.83
Nonenrollees	10,460	15.2	7,147	0.68
Total	68,812	100.0	48,464	0.70

FP clinics' effective panel size

We've shown the simple panel size; now we can calculate the effective panel size, which adjusts each site's equivalent lives numbers for the amount of care the enrollees receive at their enrollment site and the number of FTEs by the proportion of care delivered to them by site providers.

Table 47 presents the effective panel sizes for the two clinics. We begin with the number of enrollees and our calculated values of equivalent lives (based on the resource intensity values shown earlier). We must then adjust the equivalent lives values by the percentage of enrollee RVUs obtained at the site. Combined with the adjusted FTE counts, we derive panel sizes somewhat higher than we observed for each site's simple panel size. Camp Pendleton's value changes only a bit and is somewhat smaller than Jacksonville's, but again that is mainly because of the higher count of FTEs.

Table 47. Effective panel sizes, FP clinics

	Camp Pendleton	Jacksonville
Number of enrollees	15,391	14,007
Adjusted equivalent lives	15,978	14,745
Adjusted available FTEs	16.6	12.0
Effective panel size	962	1,229

Measures of FP implied demand and provider productivity

We finish the section on the two FP clinics with measures analogous to what we examined for the primary care clinics. First, table 48 presents our calculations for visits and RVUs per enrollee. The values in each case are close, with slightly lower numbers for Camp Pendleton enrollees. The numbers are similar to what we observed at the primary care clinics shown earlier, with perhaps lower values for the RVUs per adjusted life.

Second, table 49 provides two additional productivity measures for each clinic. The first is based on a calculation of the RVUs received at the site by enrollees per provider, when the number of providers considers how much care was offered to the site's enrollees. The second

is the more standard and simple measure of all visits at the site divided by the total number of available FTEs at the site. According to these measures, Jacksonville's productivity appears somewhat higher. This may not be too surprising, given that we counted fewer total FTEs and slightly higher numbers of visits. The lower value of FTEs at Jacksonville may simply result from our having to base the FTEs from EAS IV without any confirmation from the clinic that the numbers were accurate.

Table 48. Demand measures, FP clinics for their enrollees

	Camp Pendleton	Jacksonville
Visits per enrollee[a]	3.9	4.0
RVUs per enrollees	2.8	2.8
Visits per adj. equivalent life[b]	3.7	3.7
RVUs per adj. equivalent life	2.6	2.6

a. All visits and RVUs pertain to the family practice clinics only.
b. Pertains to visits by enrollees at their enrollment site.

Table 49. Productivity measures, FP clinics

	Camp Pendleton	Jacksonville
Enrollee RVUs per adj. FTE	2,517	3,210
All visits per total FTEs	3,478	4,557

Measuring the clinics' role in the demand for care

Not only should the clinics respond to the demand for care by their beneficiaries, by simply providing whatever is requested, they should also have a role in managing the care required. We recognize that *demand management* may focus on the management of care for certain conditions or diseases. In this section, we explore a more general issue—namely, how the demand for care varies across sites and the potential role that the clinics may play in managing this care. Our results are based on inferences drawn from a statistical analysis that first predicts the amount of care that would be demanded by the clinics' beneficiaries and then compares the prediction to what actually happened. When the actual amount of care is less than the prediction, we infer that the clinics had a role in reducing this demand.

The basic notion here is that although higher productivity may be a "good" attribute, there are other important issues related to good clinic management, both in terms of delivering appropriate care as well as appropriate resource management. Clinics may provide a lot of visits or RVUs, but that doesn't necessarily mean that they have effectively managed their patients' demand for services. A provider may be providing a lot of RVUs, but perhaps this has been achieved by seeing the same patients over and over again. Such providers may provide a lot of RVUs, but for a small panel. If providers can effectively manage demand to reduce unnecessary visits, they can free up capacity in the clinic, enabling it to support a larger enrollee base and/or see more nonenrollees.

Approach

To determine how well clinics manage demand, we estimated the expected amount of inpatient and outpatient care each enrollee should receive based on their demographics. We could then compare

our calculated expected demand to the amount of care they actually received. We focus on enrollees because we recognize the difficulty providers would have managing nonenrollee or space-available care.

Data

In this section, we used the 5-percent sample of DOD beneficiaries that we described in an earlier section. The advantage of a population-based sample over a workload sample is that the population-based sample shows us *all* of the care that each beneficiary in the sample received and also gives us a random sample of each clinic's workload. A workload sample may allow us to look at the workload of a clinic, but it doesn't allow us to look at the total care received by any one beneficiary.

Specifically, this population-based sample consists of 436,074 beneficiaries in FY 2002, of which 400,981 are in regions 1 through 12. Of the beneficiaries in these regions, 192,108 are enrolled to the various hospitals, clinics, and managed care contractors.

Before we go into a description of the methodology we used to look at the clinics' role in the demand for care, we present the average outpatient visit and RVUs and inpatient days and RWPs for enrollees by age group. The patterns we observe in workload and complexity across the age groups are generally consistent with the expectation of higher workload and complexity for older enrollees.

Figure 3 shows the average visits and RVUs per enrollee by age group. The patterns we observe for average visit counts seem reasonable. Visits are higher for infants than for children 1 to 17 years old and, going up the age groups, the average number of visits rises steadily. We also observe that RVUs per visit are higher for those age 65 and older than they are for those under 17 years old. However, this trend is not monotonic. RVUs per visit are higher for the 65 to 74 age group than for the 75 and over age group.

The patterns we observe with visit and RVUs are similar to what we observe with inpatient days and relative weighted products (RWPs), as figure 4 shows. We observe a large number of inpatient days for infants (nearly 3 days per infant), which is logical given patterns following childbirth. Inpatient days are lowest (134 days per 1,000 enrollees) for those 1 to 17 years old. As with outpatient visits,

inpatient days increase steadily across the age groups, but at a faster rate than visits. RWPs per inpatient day are lowest for those under 17 years old and are higher for the older age groups. This is an indication that complexity of care is generally higher for older patients.

Figure 3. Average visits and RVUs per enrollee by age group

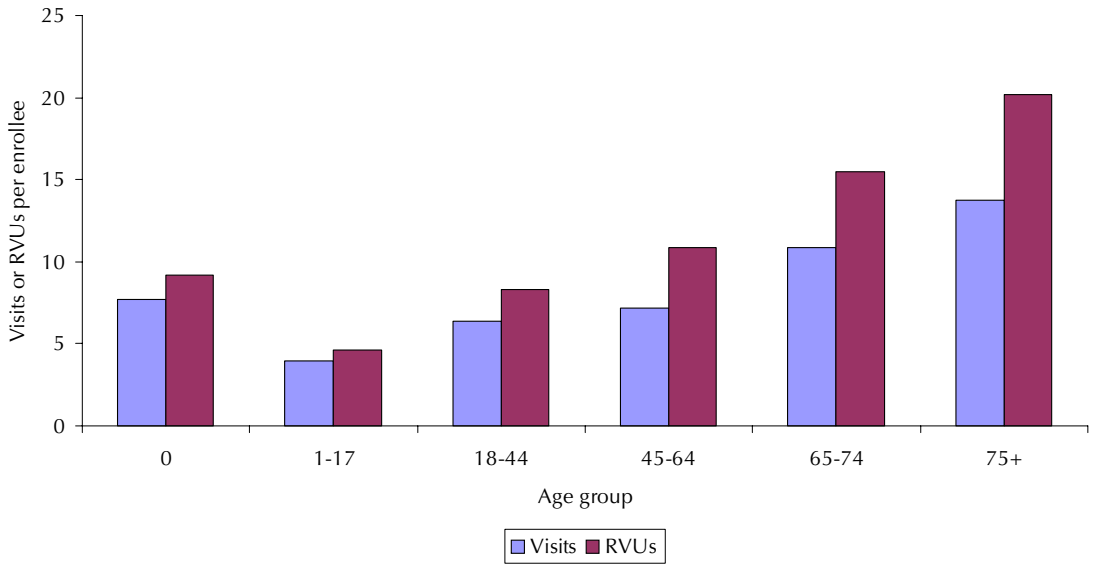
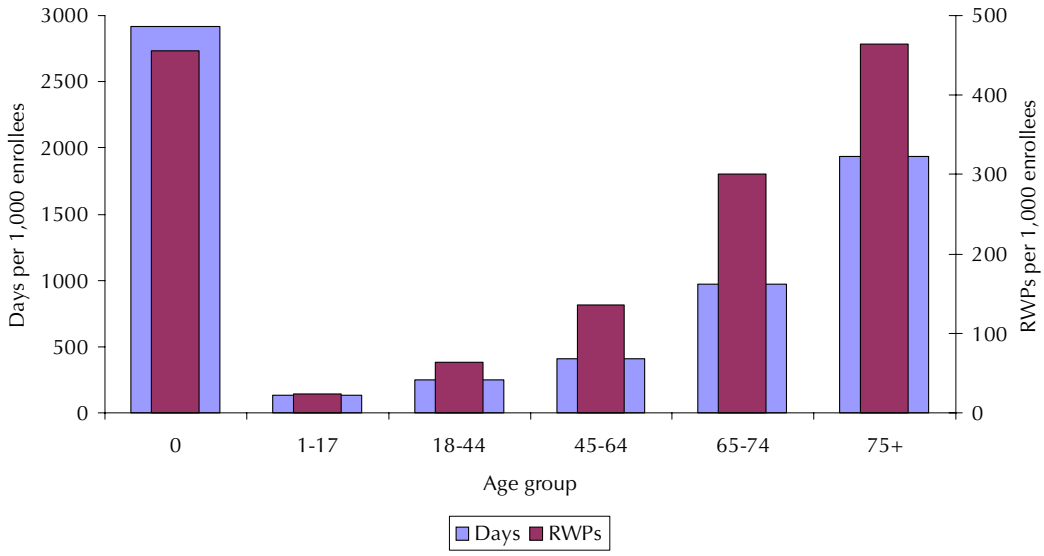


Figure 4. Average inpatient days and RWPs per 1,000 enrollees



Methodology

Again, our basic approach is to estimate how much outpatient and inpatient care we expect each demographically adjusted enrollee to receive and then compare that to the amount of care they actually received. We do this separately for each of the four workload sources using a two-step estimation process.

1. First, we estimate the probability that each enrollee has at least some workload. We do this using a probit regression model. A probit model uses a binary dependent variable and estimates the probability of an event occurring. In this case, the event is having at least some workload.

2. The second step consists of using the subset of enrollees with at least some workload to estimate how much workload each enrollee in this group should have using ordinary least squares (OLS) regression.

Finally, we compute the expected workload for each enrollee by multiplying their expected probability of having at least some workload from step 1 with the expected RVUs (the workload estimate assumes they have at least some workload) from step 2. For example, if a particular beneficiary has an expected probability of having at least some outpatient workload is 0.8 (step 1) and the expected RVU value is equal to 5 (step 2), the expected outpatient workload is 4 RVUs (0.8 x 5).[12]

Internal benchmark

Summing up the estimated workload for each enrollee, we compare the average expected workload for a clinic's enrollees to the actual workload they received. Our measure of how well a clinic manages its enrollees' demand is relationship between the expected and actual workload. If clinics' expected workload is more than actual workload,

12. A simpler estimation option is to use OLS in a single-step estimation process where we estimate workload using all enrollees—not just those with some workload. Because there are many enrollees with no workload, however, estimates are less precise and for many enrollees the predicted workload would be a negative amount. By employing the two-step procedure, we increase the precision of the estimates and remove the problem of negative workload predictions.

we infer that they are effectively managing demand. Conversely, where expected workload is less than actual workload, we infer that clinics are not managing demand as well as their peers.

In defining the effectiveness of demand management in this way, we make the assumption that providers are providing enrollees with the care they need. That is, actual visits are lower than predicted because providers are effective in reducing unnecessary care and not because they are failing to provide medically necessary care. In short, we assume that differences between actual and predicted visits are not the result of differences in quality of care.

Note that this benchmark for managing demand is an *internal benchmark*; it is not a private-sector benchmark for how many visits and hospital days enrollees should have on average. The internal standard we derived from this study's two-step regression analysis compares how well a clinic is doing compared with the other clinics, hospitals, medical centers, and managed care contractors in the MHS. In other words, the amount of care the average enrollee in the entire system receives is the benchmark. This means that the internal benchmark for our sample of enrollees is 6.0 visits per enrollee.[13]

In general, private-sector benchmarks for the average number of visits and hospital days would be a tougher standard than this internal benchmark. For example, the average number of visits per member from the *2001 Managed Care Digest Series* is 5.1 for non-Medicare and 10.2 for Medicare, whereas the average number of visits per MHS enrollee is 5.8 for those under 65 years old and 11.8 for those 65 years and older.[14] Similarly, data from the Centers for Disease

13. We have limited our sample to the 192,108 enrollees in regions 1 through 12. And, because our focus in this section is the impact clinics have on managing demand, we excluded MTFs with less than 200 enrollees in our sample. This further limited our sample to 173,652.

14. These figures include physician encounters and ambulatory visits to a physician's office but the member may not be seen by a provider. (The member is there for tests, injections, immunizations, etc., which would only "count" if the procedure is associated with a non-zero RVU.) Specifically, for non-Medicare, physician encounters per member were 3.2 and the ambulatory visits were 1.9 for a total of 5.1.

Control show that the number of physician visits per person is 3.0.[15] Hence, by comparing MTFs to their peers, we are applying a less stringent standard than those from the private sector.

Adjusting for demographics

Overall, the average number of visits or internal benchmark is 6.0, but because we expect demographics to affect demand, we adjust this benchmark for demographics. We to this using regression analysis, which allows us to estimate how much care, as measured by their RVUs, the average enrollee receives *given their demographics*. Specifically the analysis controls for age, gender, race, marital status, sponsor paygrade, sponsor Service, beneficiary category, and whether the enrollee is in a catchment area. Hence, the internal benchmark for a 20-year-old person on active duty is less than for a 75-year-old retiree.

Controlling for age and gender allows us to control for differences in health care demand and how those differences vary by gender. We controlled for age using age groups rather than using the numeric age. Using age groups is better than using the numeric age because health care demand does not increase linearly as age increase. While health care needs are generally higher for those 65 years or older than for those in their twenties, the rate of increase in health care needs is not constant and there is high demand at some ages.[16]

In addition to age and gender effects on health care demand, marital status substantially affects health care demand. For example, the health care needs of young married women are substantially more than for their unmarried counterparts because of the associated higher likelihood of pregnancy and childbirth.

Control for sponsor paygrade is in some sense a control for income with the idea that health care demand varies by income level. In the military, however, the relationship between income and health care

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15. This figure is comparable to the number of physician encounters per member from the *2001 Managed Care Digest Series* (*Advance Data*, No. 328, June 5, 2002, p.10).

16. C. Phelps, *Health Economics*, 2nd ed., 1997, Addison-Wesley Educational Publishers, Inc.

demand isn't as strong as in the private sector because there are no copays or deductibles.

Controlling for an enrollee's beneficiary category is not so much a control for health care needs as it is a control for where enrollees tend to get care. Active duty enrollees tend to get a much higher percentage of their care in the direct care system than do active duty dependents, retirees, and retiree or survivor dependents. Similarly, whether enrollees live in a catchment area has a substantial impact on how much of their care they get in the direct care system.

In addition to these enrollee characteristics, we have controlled for the type of facility the enrollees are enrolled to—medical center, hospital, clinic that is a child of a larger MTF, clinic that is its own parent, or managed care contractor. We have controlled for facility characteristics for two reasons. First, the different type of enrollment sites have varying capabilities to provide certain types of care. Enrollees at a medical center or hospital, for instance, should be more likely to get specialty care at an MTF (rather than in the network) than enrollees to a clinic or managed care contractor.

Second, while controls for age are in some sense a proxy for health, they do not completely capture it. We hypothesize that less healthy individuals have a tendency to locate themselves near large MTFs where they have easier access to medical care. Indeed, the detailing process takes medical considerations (of sailors and their dependents) into account when deciding where a person will be stationed. It also seems reasonable that retirees and their dependents would be less likely to locate in remote areas if they feel that, for health reasons, they need to have more immediate access to medical care. If this is true, where an enrollee is enrolled is another proxy for health.

Finally, we also controlled for the geographic region the facility is in, if it is in a revised financing region, and whether the facility is a graduate medical education (GME) facility. The idea of controlling for geographic region is to account for systematic demand differences due to such things as climate. Controlling for revised financing regions accounts for the different incentives the MTFs face because of it. The rationale for controlling for GME is the same as the proceeding rationale for controlling for facility type.

When we statistically control for demographics, the directional impact these demographic variables have on the amount of care received is as expected. For example, table 50 shows that men use significantly less care than women. Similarly, children or those who are single use significantly less care than those who are married. We also observe that, if both spouses are in the military, they tend to get more care from MTFs than the network.

Table 50. Impact of demographics and other factors on the amount of care received per enrollee

Variable	Care received in the direct care system (MTFs)	Care received in the purchased care system (network)
Age	Impact varies by age[a]	Impact varies by age
Males relative to females	Negative	Negative
Blacks relative to whites	Positive	No impact[b]
Singles relative to married	Negative	No impact
Children relative to married	Negative	Negative
Both spouses in military	Positive	Negative
Navy relative to Army	No impact	Positive
Navy afloat relative to Army	Negative	Negative
Air Force relative to Army	No impact	Positive
Marines relative to Army	Negative	Positive
Coast Guard relative to Army	Negative	Positive
Rank of sponsor	Impact varies by rank	Impact varies by rank
Live in a catchment area	Positive	Negative
AD dependents relative to AD	Negative	No impact
Retirees relative to AD	Negative	No impact
Retiree dependents relative to AD	Negative	No impact
Enrolled at hospital relative to a medical center	Negative	Positive
Enrolled at a teaching hospital	Positive	Negative
Enrolled to a clinic relative to a medical center	Negative	Positive
Enrolled to the network relative to a medical center	Negative	Positive
Live in a revised financing region	Positive	Negative

a. For example, those age 0 use significantly more care than those aged 18 to 25 years; those aged 11 to 17 use significantly more care than this same age group.
b. No impact means that the effect is not statistically significant.

For purchased care, whether the sponsor's service is Army, Navy, or Air Force makes no significant difference in the amount of care received in the MTFs, but Navy and Air Force enrollees tend to

receive more purchased care than Army enrollees. However, those Navy personnel who are afloat receive significantly less MTF care than that do enrollees with an Army sponsor. We observe similar patterns with the Coast Guard and Marine Corps. These differences may stem from differences in the availability or relative proximity of MTFs for beneficiaries of the various services.

Not surprisingly, active duty beneficiaries receive a greater proportion of their care in the MTFs than do all beneficiary categories. Similarly, where a person is enrolled significantly affects the amount of care received. For example, those enrolled in medical centers receive more care in MTFs than those enrolled in community hospitals or clinics. Further, those enrolled directly to the network receive more care in the network than in MTFs. Finally, whether the health service region operates under a revised financing contract significantly affects the amount of care received in the MTFs and the network.

Outpatient care

The focus in this section is examining primary care demand management in terms of all outpatient care as well as inpatient care. That is, effective demand management in the primary care setting may be able to reduce the amount of unnecessary care in other settings.

Table 51 shows the number of primary care visits and RVUs per enrollee as well as all outpatient visits and RVUs per enrollee.[17] It shows these figures for three Portsmouth clinics, three San Diego clinics, the naval medical centers (NMCs) at Portsmouth and San Diego, and the naval hospitals (NHs) at Jacksonville and Camp Pendleton. We show both visit and RVU data for comparison, but our

17. Our definition of primary care was outlined earlier in the paper. For the direct care system, we define primary care visits based on the 3-digit MEPRS codes: BDA (pediatrics), BDB (adolescent), BDC (well baby), BGA (family practice), BHA (primary care), BHB (medical examination), BHH (TRICARE outpatient clinics), and BHI (immediate care). For the purchased care system, we define primary care visits based on provider type: family practice, internal medicine, general practice, pediatrics, nurse practitioners, and physician assistants.

focus is on RVUs because visits are not all the same, but differ in level of complexity.

Table 51. Visits and RVUs per enrollee by enrollment site (FY 2002)

Enrollment site	Direct care		Purchased care		Total	
	Visits	RVUs	Visits	RVUs	Visits	RVUs
Primary care						
Little Creek (LC)	2.9	2.8	0.1	0.1	2.9	2.9
Naval Training Center (NTC)	2.5	2.2	0.1	0.1	2.5	2.3
Sewell's Point (SP)	2.5	2.6	0.0	0.0	2.5	2.6
Naval Station (NS)	2.3	2.2	0.0	0.1	2.3	2.2
TPC Virginia Beach (VB)	3.6	3.0	0.1	0.1	3.7	3.1
TOC Clairemont (Cl)	3.0	2.0	0.1	0.1	3.1	2.1
NMC Portsmouth	2.3	2.1	0.1	0.1	2.3	2.3
NMC San Diego	2.7	2.4	0.1	0.2	2.8	2.6
NH Jacksonville	2.9	2.3	0.1	0.2	3.0	2.6
NH Camp Pendleton	2.9	2.6	0.1	0.2	3.1	2.7
All outpatient care						
Little Creek (LC)	5.5	7.1	0.6	1.2	6.1	8.3
Naval Training Center (NTC)	5.7	8.2	0.2	0.5	5.9	8.7
Sewell's Point (SP)	62	9.5	0.2	0.5	6.4	10.0
Naval Station (NS)	5.5	7.4	0.1	0.2	5.5	7.6
TPC Virginia Beach (VB)	5.7	6.0	0.7	1.2	6.4	7.2
TOC Clairemont (Cl)	4.7	5.2	0.3	1.0	5.0	6.1
NMC Portsmouth	7.5	9.1	0.4	1.1	7.9	10.1
NMC San Diego	6.9	9.5	0.3	0.9	7.2	10.5
NH Jacksonville	6.1	6.4	0.5	1.5	6.6	7.9
NH Camp Pendleton	6.7	9.5	0.3	1.0	7.0	9.2

Although the clinics chosen for this study were picked because they have similar characteristics, such as Sewell's Point and Naval Station being primarily active duty clinics, there are differences. Naval Station has virtually 100 percent active enrollees, whereas 71 percent of enrollees at Sewell's Point are active duty. Consequently, we must be very careful when comparing the clinics. For example, simply because the average primary care RVUs per enrollee at Sewell's Point (2.6) is higher than at Naval Station (2.2), we should not immediately conclude that Naval Station is managing demand better than Sewell's Point. The differences we see might simply be a function of demo-

graphic differences between enrollees. It could be that, once we account for enrollee demographics, Sewell's Point is more effectively managing demand.

Applying our statistical approach to predict RVUs tells us what RVUs should be given the enrollees' characteristics. This is the internal benchmark of how much care they should have received based on the average across the MHS. For example, suppose we have two sites, A and B. The actual RVUs per enrollee at site A is 6.5 compared to 7.0 at site B. The predicted RVUs per enrollee—internal benchmark based on demographics—shows that RVUs per enrollee at site A should have been 6.0 compared to 7.5 at site B. We conclude from this that site B is more effectively managing demand because its actual RVUs were less than the benchmark, whereas actual RVUs were higher than predicted RVUs at site A.

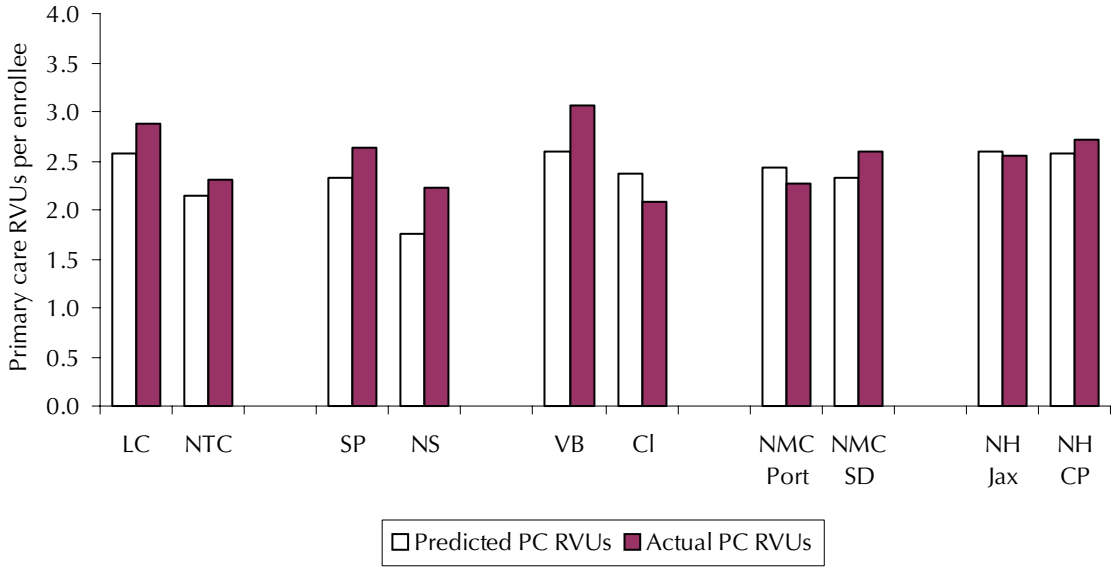
Figure 5 shows the predicted versus actual RVUs by enrollment site. The white bars on the left are the predicted (benchmark) numbers of primary care (PC) RVUs per enrollee. These are predicted PC RVUs in the direct and purchased care systems with the vast majority of the care in the direct care system. The red (dark in black and white) bars on the right represent the actual numbers of PC RVUs in both the direct and purchased care systems.

When we say that a clinic's enrollees had on average 2.1 PC RVUs in the direct care system, it does not necessarily mean that all of those RVUs occurred at the enrollment site. For example, enrollees at Little Creek will likely have most of their primary care at Little Creek, but they may also have some at NMC Portsmouth and some at other clinics, such as Sewell's Point. Hence, when we say Little Creek, for example, we mean where people are enrolled and not necessarily where the the care occurred.

Comparing the matched clinics, Naval Training Center's and Little Creek's actual primary care RVUs per enrollee are more than their predicted values, but Naval Training Center's actual numbers are closer to its predicted than is Little Creek. Hence, this methodology suggests that neither Naval Training Center nor Little Creek manages demand as effectively as the average MTF, but that Naval Training Center manages demand more effectively than Little Creek. We

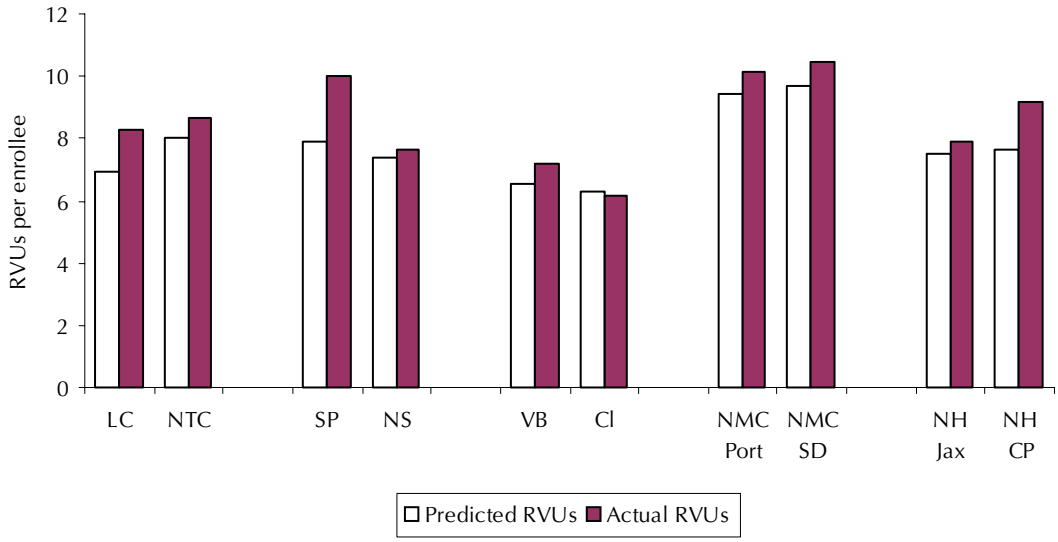
observe a similar pattern with Sewell's Point and Naval Station; Sewell's Point is closer to its predicted value. As for Virginia Beach and Clairemont, Clairemont's actual PC RVUs per enrollee are less than its predicted, whereas Virginia Beach's actual exceeds its predicted.

Figure 5. Actual and predicted primary care RVUs by enrollment site (FY 2002)



In addition to primary care RVUs, we are interested in the number of RVUs for outpatient care in general. Figure 6 shows the actual and predicted numbers of outpatient RVUs by enrollment site. When we compared primary care RVUs per enrollee between Virginia Beach and Clairemont, Clairemont fared better in actual-to-predicted primary care RVUs. This pattern still holds when we look at all outpatient RVUs, but the performance of the two clinics is more similar than with PC only. Though it is hard to explain the difference between primary care and all outpatient care, one reason may be that, by providing more PC RVUs, Virginia Beach was able to lessen the demand/need for non-PC RVUs.

Figure 6. Actual and predicted outpatient RVUs by enrollment site (FY 2002)



Similarly, Sewell's Point fared better than Naval Station when we looked only at PC RVUs, but worse when we looked at all outpatient RVUs. Little Creek and Naval Training Center fared about the same relative to each other in either RVU measure. The NHs at Jacksonville and Camp Pendleton fared similarly under either RVU measure, with NH Jacksonville faring slightly better in both cases (PC only and all outpatient care). Again, there may be many potential explanations for the differences between the primary care and all oupatient care results, but one possibility is that MTFs may be able to limit non-PC through some of the primary care it provides.

Inpatient care

We now turn to looking at demand management in the inpatient setting. We do this because demand management is more than controlling primary care and non-PC visits. It also involves reducing the need for costly inpatient care.

Table 52 shows the actual inpatient days and relative weighted products (RWPs) per 1,000 enrollees by enrollment site. RWPs are a measure of complexity of inpatient care, just as RVUs are a measure of

complexity of outpatient care.[18] Inpatient days and RWPs vary substantially across the enrollment sites. For example, Naval Station has the fewest inpatient days (118 per 1,000 enrollees) of these enrollment sites. This is logical because its enrollment is nearly 100 percent active duty and they are less likely to be hospitalized.

Table 52. Inpatient days and RWPs per 1,000 enrollees by enrollment site (FY 2002)

	Direct care		Purchased care		Total	
Enrollment site	Days	RWPs	Days	RWPs	Days	RWPs
Little Creek (LC)	188	42	68	14	256	56
Naval Training Center (NTC)	261	84	21	11	282	95
Sewell's Point (SP)	248	58	12	3	261	62
Naval Station (NS)	114	37	4	5	118	42
TPC Virginia Beach (VB)	284	57	117	31	400	87
TOC Clairemont (Cl)	145	43	197	6	342	49
NMC Portsmouth	779	198	90	26	869	224
NMC San Diego	494	137	155	15	649	153
NH Jacksonville	218	62	167	35	385	97
NH Camp Pendleton	453	121	111	23	564	144

In comparison, the TRICARE clinics (VB and Cl) have about three times as many inpatient days as Naval Station. This is reasonable because these clinics treat mostly active duty dependents and almost no active duty. To clarify, we are not saying that the clinics are providing inpatient care, but that this is the inpatient care these clinics' enrollees received throughout the direct and purchased care systems.

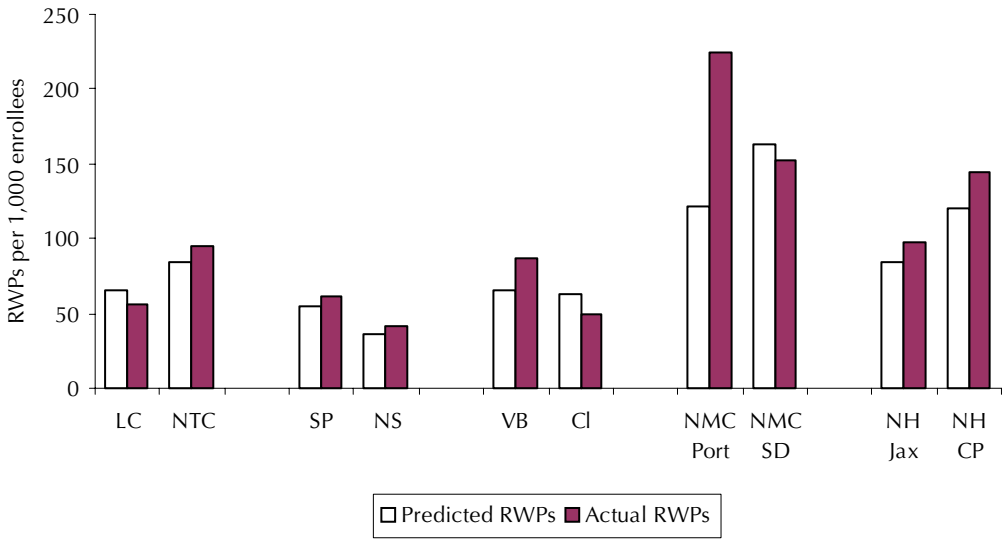
The enrollment sites with the highest number of inpatient days per 1,000 enrollees are the medical centers. Clearly, some of the additional inpatient days are the result of demographic differences between each site's enrollees. For example, the medical centers have much higher percentages of retirees and retiree dependents than the clinics. In addition, the number of inpatient days may be higher

18. The RWP quantifies the relative resource consumption of an admission of disposition based on the diagnosis related group (DRG). The DRG code is itself "grouped" based on the diagnosis codes, procedure codes, discharge status, sex, birth date, admission date, and discharge date.

because fewer health people may tend to enroll at a large MTF than at a clinic.[19]

Figure 7 shows the actual and predicted number of inpatient RWPs per 1,000 enrollees. Comparisons of actual and predicted inpatient RWPs with the patterns we observed with outpatient RVUs show some similarities. First, Sewell's Point and Naval Station have actual RWPs that exceed predicted RWPs. The same pattern holds for NH Jacksonville and NH Camp Pendleton. This is the same pattern that we observed with outpatient RVUs. Second, Clairemont has lower actual inpatient RWPs than predicted, but the opposite is true for Virginia Beach. We observe this same pattern for these clinics with primary care and all outpatient RVUs.

Figure 7. Actual and predicted inpatient RWPs by enrollment site (FY 2002)



As for differences, we observe that Little Creek fared better than Naval Training Center in terms of actual inpatient RWPs relative to

19. Again, this is the reason we controlled for the type of facility a beneficiary is enrolled to in our analysis.

predicted RWPs. The opposite was true with primary care and outpatient RVUs: Naval Training Center fared better than Little Creek.

Although the matched-clinic pairs—not the medical centers—are the focus of the analysis, we present the medical centers' data for comparison. Specifically, we observe that NMC Portsmouth fared better than NMC San Diego in terms of primary care and outpatient RVUs. When we look at actual versus predicted inpatient RWPs, the actual number of RWPs for NMC San Diego's enrollees is slightly less than the predicted number. However, for NMC Portsmouth's enrollees, actual inpatient RWPs exceed the predicted amount by over 80 percent. This finding is consistent with the financial difficulties Portsmouth had in FY 2002. Further, although there are some variations, it seems that the clinics in both Portsmouth and San Diego perform roughly how we expect them to given the demographics of their enrollees. Major differences seem to occur at the medical centers—we observe higher actual demand than predicted demand for primary care at NMC San Diego and for inpatient care at NMC Portsmouth.

Summary

Because RVUs and RWPs are different measures, it is difficult to combine our demand management results from the outpatient and inpatient settings. Clearly, there are some tradeoffs. Limiting care in one area may cause care to rise in another. Conversely, more intensive use of one type of care may lead to less use of another type.

For example, more intensive use of primary care may lead to less specialty care because problems were treated and/or prevented in the primary care setting. The patterns we observed for Naval Station and Virginia Beach may support this. For these MTFs, they fared better relative to the internal benchmark when we looked at all outpatient RVUs than when we looked only at PC RVUs. For this to occur, this means a lower specialty-to-PC ratio than the other clinics. The point is that just looking at the primary care visits per enrollee as a means of comparison between clinics may lead to faulty conclusions if more primary care leads to less specialty care.

Although the statistical results may show that some clinics "poorly" manage demand (relative to their MTF peers) because their enrollees received more care than the average across the system, we do not believe this is a definitive indication that the clinic is doing a "bad" job. We recognize that the data do not allow us to control for all characteristics and factors that affect demand. Similarly, there may be clinic-specific factors that we cannot control for that may explain the variation. That said, we believe that the preceding analysis provides useful information because it identifies clinics that should be examined more closely. "Good" clinics can be examined more closely to find out (a) if they are indeed performing well and (b) if what they are doing that can be exported to other clinics. Similarly, "bad" clinics can be examined more closely to find out if they are actually doing poorly and, if so, what can be done to improve their performance.

Measuring clinic and purchased care costs

We've been examining a number of workload and productivity measures, but it's hard to compare how productive a site may be without some discussion of how that higher productivity affects the bottom line, i.e., the cost to the government. Unfortunately, it's difficult to determine the costs of health care even in the civilian sector. It becomes even harder in the public sector, particularly when one government agency, in this case DOD, produces health care services at its own facilities or through arrangements with the civilian health care sector. Nonetheless, we will discuss the costs of providing care, comparing costs across clinics and with the civilian sector when DOD pays the bills of its beneficiaries.

In addition to obtaining cost estimates, we will discuss some of the implications for direct care costs that may be associated with what is known as *revised financing*. We mentioned this term earlier and said we were most interested in understanding whether the presence of revised financing in certain regions (in our case in Region 2, which includes the Portsmouth clinics) affects outpatient care delivery at the clinics.

Measuring cost

We begin with the costs of providing outpatient care. We would like to examine the price of care to the government or beneficiary, both in the direct and purchased care systems. As an analogy, we would normally want to compare the alternative prices of loaves of bread when determining which one to buy, not what it costs the manufacturer to make them. There should be a relationship between price and cost, but the ultimate decision by the consumer depends on the price he or she observes. Similarly, consumers of health care services will respond to the *price* of outpatient health care services, which should reflect all costs incurred, such as the providers' compensation

(including past training costs), office costs, as well as any profit on the services provided. A private-sector claim generally represents the full price of care. Even here, we will report on the *cost* to DOD of the private-sector care that must be paid to settle the claim, not the total allowed costs, some of which are paid by beneficiaries or other health insurance.

There is also another complication that arises because of the complexity of claims forms as well as deriving costs that are comparable to what we report for the direct care system. To be more specific, purchased care claims generally pertain to the type of service provided. There are claims for professional services offered by physicians, physical therapists, nurses, and other medical professionals. This is one cost of the visit, but many would argue that it's incomplete. Other associated costs must be included to derive the total outpatient visit cost. For example, there are often claims to the facilities in which the physician was located when he or she provided the services, such as an outpatient surgical center. In addition to the facilities charge, there may be other claims for laboratory services required for conducting blood tests or cancer screening. Therefore, an outpatient visit cost may need to consider all of these supporting services. The extent to which these kinds of services must be included depends on the comparable services delivered in the direct care system.

On the direct care side, we can calculate several possible measures, all of which are based on the cost of producing the service. Therefore, we will assume that if we carefully construct a measure based on the appropriate costs, it can be compared to our purchased care measure.

All measurement of the costs associated with direct care visits begins with MEPRS. Expenses in MEPRS are assigned to work centers, which relate directly to the specific 3- or 4-digit codes we've been using to designate where primary care is provided to beneficiaries. A problem we and others face in measuring the costs of care is not that there may be an inappropriate linkage between cost and workload; the MEPRS codes link the amount of work to the costs of providing those services. The bigger problem is determining which definition of cost is most appropriate.

We'll present a few different measures, with two of them representing lower and upper bounds on the per visit costs. Then, we will suggest the measure we believe is most appropriate and is based on the same method that has been offered as a "reasonable" measure under the TRICARE for Life (TFL) program when reimbursement must be made to the direct care system for outpatient care received by DOD beneficiaries. We recognize the controversial nature of comparing direct and purchased care costs, but we try to develop measures that we believe are appropriate.

Different sources can be used to derive the costs of outpatient services, but all are essentially based on MEPRS. From the M2 file based on the SADRs, all countable visits have a number of possible costs that have been associated with them. Unfortunately, there is too much controversy surrounding the reliability of these costs, so we have avoided them in this analysis. Rather, we rely on methods that begin with data from the EAS IV system, based on the DOD Standard Expense Element Code (SEEC). These codes are used to total service-level detailed expense and obligation data into a uniform format for OASD/Health Affairs. For each activity, such as the family practice clinic at NBMC Sewell's Point, all of the expenses are detailed by specific SEECs.

A slightly different way of observing the costs at the same set of primary care or family practice clinics are from MEPRS directly, which provides counts of visits, direct expenses and other costs, including ancillary and support expenses. We begin with direct expenses, which are those identified specifically with a particular work center. The direct expense does not include expenses that might be identified with two or more work centers. In the expense assignment process, sometimes referred to as the "step-down" procedure, all intermediate operating expense accounts are fully distributed to final operating expense accounts. The two types of accounts of interest for us are ancillary services (from the "D" accounts, including pharmacy expenses associated with that work center) and the support services (from the "E" accounts, including GME and plant management). By adding the stepped-down D expenses and the stepped-down E expenses to the direct expense, we derive the total expenses associated with outpatient visits to the particular clinic of interest. It would

include all facility charges and any laboratory or ancillary costs, including pathology or radiology services.

We believe that the direct expense provides too low a measure of the cost that can be compared to a civilian "price," and the total expense that includes these stepped-down intermediate expenses is too high. In other words, direct expenses exclude some important costs—office and other overhead costs that should be included—that are part of producing health care services and allow for comparison with purchased care costs. But the total expense measure includes too many cost elements, such as prescriptions dispensed at the clinic as part of the visit, which would not be included in the cost of a civilian outpatient visit.

Therefore, we create a measure that will approximate what might be thought of as the total cost associated with outpatient care. When divided by the number of (raw, countable) visits, the measure we obtain then approximates the average cost (AC). We derive this measure by starting with the clinic's total expenses, but then subtract three specific expenses:

- Depreciation of equipment (from EAS IV, SEEC # 31.30)
- Free receipts, or nonreimbursables, are goods, services, or equipment provided to an activity, such as a clinic or MTF, and not financed from that activity's operating budget (from EAS IV, SEEC # 41.20)
- Pharmacy stepdown expenses associated with that clinic.

The result of this simple calculation will be our measure used in this analysis. The next section compares these values to the direct and total expenses for the same clinics.

Outpatient visit costs at the clinics

Table 53 presents three measures of costs (all per visit) for the six clinics. As we expected, there are wide discrepancies in the per-visit costs, particularly between direct and total expenses. For example, the average direct expense is $93 at the Naval Training Center, but only $50 at Little Creek. The differences are much less between the paired

Portsmouth and San Diego clinics at the other sites, ranging between $39 and $69. At the other extreme are the average total expense. NTC's is very high, over $200, but the others range between $111 and $131. In between the average direct and total expenses are our calculated average costs, the measure we argue is most appropriate and use for the costs of outpatient care. In general, it appears that the AC is reasonably close to the average of the two, although that's not always the case. It does appear to be in a reasonable range, from $82 at Sewell's Point up to $159 at NTC.

Table 53. Measures of direct care costs, on a per-visit basis, PC clinics (in dollars)

Measure	NTC	Little Creek	Naval Station	Sewell's Point	Clairemont	Virginia Beach
Average direct expense	93	50	69	48	39	55
Average cost	159	88	138	82	99	92
Average total expense	216	131	160	111	131	125

Table 54 presents the same costs for the FP clinics at NHs Camp Pendleton and Jacksonville. Note the wide range between direct and total expenses, and that the costs generally are very close to each other. This is also true of the AC, which is more or less in the middle range of what we observed at the primary care clinics. The interesting finding here is that the average visit costs we use are about $1 apart.

Table 54. Measures of direct care costs, on a per-visit basis, FP clinics (in dollars)

Measure	Camp Pendleton	Jacksonville
Average direct expense	59	47
Average cost	108	109
Average total expense	160	168

These costs pertain to an average visit made to that particular site. Calculating the costs as we have means there's no distinction between the costs of care for an enrollee or a nonenrollee. Nevertheless, we can compare the costs of providing the care for each site's enrollees at the various sites where they receive care as long as we're willing to accept the overall visit cost for that site. Making these comparisons meant obtaining estimates for the local medical center (i.e., either

NMC San Diego or NMC Portsmouth) as well as other sites the enrollees may have gone to. Creating the AC for all of the sites the six sites' enrollees might have gone to sometime in 2002 would have meant performing the calculations for dozens if not hundreds of sites. Therefore, we created an "all Navy" value and use it for the "other sites" costs. Finally, we use the "loaded" purchased care costs, which means the DOD costs for an outpatient visit after having associated all facility, laboratory, and ancillary charges.[20]

Although our method does not distinguish among enrollees' and nonenrollees' care when calculating a site's costs, we can at least make certain allowances for the complexity of care received by the enrollees, depending on where the care was received. We know the average RVU of the visit for enrollees, whether received at the enrollment site, the local medical center (i.e., NMC San Diego or Portsmouth), other MTFs or clinics, or a civilian site. We can divide the average cost for the site by the average RVU of the visit to derive an average "complexity-adjusted" cost depending on where the care was received. We realize this measure isn't perfect, and we would rather have all measures calculated directly for each visit and then averaged, but we believe our measure serves as a reasonable proxy.

Table 55 presents the bundled average visit cost for the San Diego-area clinics' enrollees. We've also provided the AC per RVU at each site as another indicator of how costs may vary across the sites of interest.[21] Again, note that the ACs for NMC San Diego visits and other clinics' visits are the same for all three enrollment sites' comparisons. What we want to compare are the costs of the visit across enrollment

20. Our procedure for determining the total cost of a purchased care visit, i.e., with all relevant services included, was based on the sample data we described in the previous section. We relied on the 5-percent sample of beneficiaries and their care and costs to determine the ratio of all of the costs to the cost of the visit to the provider alone. This ratio is what we call the "bundling factor," which we then could apply to the average visit cost that we determined for enrollees using purchased care. We calculated this factor for each clinic's enrollees separately, but we decided to calculate it in each catchment area and then apply it to the average visit cost for a given clinic's enrollees. We did this for primary care (PC), PC ER, non-PC, and non-PC ER visits. For primary care, the San Diego factor was 1.12 and in Portsmouth it was 1.38.

sites as well as with the network costs. For two of the sites, at the Naval Station and TOC Clairemont, the clinics' costs are a little higher than care received in the network, but less than the care received either at NMC San Diego or other direct care sites. That's not the case at NTC, which is the highest of any of the sites. At this point, network costs are lower, but one important reason is that we've determined the cost only for the government paid portion. In other words, the beneficiary pays part of the cost, on the order of 15 to 20 percent for his or her purchased care visit.

Table 55. AC per visit or RVU, for enrollees of three San Diego area clinic s

Treatment site	AC/visit ($)	RVU/visit	AC/RVU ($)
Naval Training Center			
NTC	159	0.80	199
NMC San Diego	141	0.79	178
Other clinics	120	1.02	117
Network	75	0.91	82
ER			
At NMC	310	0.83	373
Network	96	1.62	59
Naval Station			
Naval Station	138	1.11	124
NMC San Diego	141	0.81	174
Other clinics	120	0.95	126
Network	97	1.10	88
ER			
At NMC	310	0.82	378
Network	90	1.56	58
Clairemont			
Clairemont	99	0.62	160
NMC San Diego	141	0.78	181
Other clinics	120	0.87	138
Network	63	0.87	72
ER			
At NMC	310	0.92	337
Network	97	1.72	56

21. The RVUs from tables 13 and 14 are provided in this and the next table to make the calculation easier.

Note also that we've included visits to the primary care, as long as the provider seen is one of the group we're characterizing as a primary care provider. Whether these are for primary care is debatable. But, the larger point is that there appears to be a large difference in cost whether the beneficiary went to the medical center, where the cost was more than $300, or to a civilian facility, where the cost was under $100.

Once corrected for RVUs, there are further differences in the cost of providing care, at least for NTC and Clairemont. NTC's costs become even higher, with an RVU-corrected visit more than twice as high as if received in the network. An RVU-corrected visit is still cheaper when received at Clairemont than at other direct care sites, but it now becomes 86 percent more expensive than a network visit. The only site that appears to be reasonably competitive is the Naval Station. Its RVU-corrected average visit cost is about 14 percent higher, which seems small given the uncertainty associated with creating per-visit costs.

Table 56 presents the analogous results for the Portsmouth area clinics. Costs are generally lower than the San Diego clinics. In all cases, the AC is lower at these clinics than if the care were obtained at NMC Portsmouth or other direct care clinics but well above network costs. For example, the average visit cost is $88 at Little Creek, but $159 at NTC, and about $42 in the network. Sewell's Point's average visit cost is $82, compared with $49 at the network. TPC Virginia Beach's average visit cost is $92, compared with $49 in the network.

There are changes, however, once we correct for complexity. Little Creek's AC per RVU rises to $105, still lower than NMC Portsmouth or at other clinics, but substantially higher than our calculated network cost of $59. Sewell's Point's costs move closer to the network costs, within about $18 dollars. Finally, Virginia Beach's costs rise to $121 per visit, which is substantially higher than the network's $60 RVU-corrected cost.

Table 56. AC per visit or RVU, for enrollees of three Portsmouth area clinics

Treatment site	AC/visit ($)	RVU/visit	AVC/RVU (S)
Little Creek			
Little Creek	88	0.84	105
NMC Portsmouth	174	1.43	122
Other clinics	120	1.00	120
Network	42	0.71	59
ER			
At NMC	206	0.90	229
Network	77	1.52	51
Sewell's Point			
Sewell's Point	82	0.99	83
NMC Portsmouth	174	1.25	139
Other clinics	120	0.96	125
Network	49	0.75	65
ER			
At NMC	206	0.88	234
Network	75	1.49	50
Virginia Beach			
VA Beach	92	0.76	121
NMC Portsmouth	174	1.43	122
Other clinics	120	0.82	146
Network	49	0.82	60
ER			
At NMC	206	0.95	217
Network	83	1.62	51

There are also large differences in costs for ER visits, although the spread isn't quite as large as at San Diego. NMC Portsmouth's average visit cost for an ER visit is slightly above $200, as compared to about $75 or $80 for an ER cost to the network. The spread widens even more, however, once we correct for the average RVU per visit.

Finally, table 57 presents the costs calculated in the FP clinics in a simple comparison between their costs and the network. The differences in cost were already fairly substantial with the network when examined on a per-visit basis, but the difference really grows, at both sites, when calculated using the average visit cost per RVU.

Table 57. Average cost, per visit or RVU, for two FP clinics

	AC/visit ($)	RVU/visit	AVC/RVU (S)
Camp Pendleton			
Camp Pendleton	108	0.72	150
Network	50	0.93	54
Jacksonville			
Jacksonville	109	0.70	156
Network	31	0.94	33

Thus, in this section we've outlined a method for deriving a per-visit cost that can be used to compare clinics within the direct care system as well as with purchased care costs. The findings for the primary care and family practice clinics suggest they are generally cost-effective when compared internally with other direct care sites, but are more costly than for care in the civilian network. The numbers indicate substantial differences, and it seems important to understand why these differences exist. One reason we have not accounted for is any readiness-related cost. We recognize that such costs exist and suggest additional work to incorporate readiness-related issues. However, we've already noted that there appear to be more providers on staff than FTEs actually providing patient care services. It is costly to have large numbers of staff relative to the number of FTEs. Although readiness is one reason for this difference, it is probably only one factor, and the others should be scrutinized to ensure they don't add unnecessarily to costs.

Implications of revised financing

This area of our analysis examined the implication of the financing policies associated with the managed care support contracts. NMC Portsmouth operates under the revised financing arrangement introduced under the contracts in Region 2. In contrast, NMC San Diego operates in Region 9 under the traditional financing model employed by the MHS. Our conclusion from the various clinic visits was that the Portsmouth area clinics were much more concerned with tracking and controlling referrals than the San Diego clinics. That is not to say that referrals were not important to the San Diego clinics, but the nature of the managed care contracts would seem to lead

Portsmouth to screen referrals to the network more carefully. Although revised financing is not the main focus of this study, we felt it was important to examine given the apparent focus on referrals we observed during our Portsmouth area clinic visits.

Under the traditional model, there are two separate pools of monies for direct care and purchased care. The MTF is accountable for the direct care budget, and TRICARE Management Activity is accountable for the purchased care budget. In an effort to control the escalation of the health care costs, revised financing was introduced.

Under revised financing, the MTF is accountable for both the direct and purchased care budgets. The hypothesis of the new financing policy is that, through fiscal accountability of all care provided to an MTF's enrollees, the MTFs would better manage and direct the care to control cost.

During our site visits, a clear area of focus for NMC Portsmouth was referrals and the need to ensure the medical necessity of the referrals. NMC San Diego did not have an emphasis or a clear tracking mechanism for referrals. Plans were under way to implement a Consult Management Center with drop-down protocols for referrals.

Earlier, we noted that the specific manner in which enrollee care is financed under the managed care support contracts would likely influence the number of referrals to the network. Portsmouth is in Region 2, which means it falls under the managed care support contract that includes revised financing. Again, under revised financing, the MTF at which the beneficiary enrolls is "responsible" for all of his or her care. If the enrollee should need a referral outside the direct care system, the MTF must pay the cost out of funds it has been given for enrollee care. San Diego does not yet fall under revised financing, but it will when the new round of contracts replace the current one. That doesn't mean it would be unconcerned with referrals to civilian providers, but the concern does not have the full budgetary implications that it does in Portsmouth. That is why, during our visit, the Portsmouth area clinic managers were concerned with referrals, not only directly to the network, but even to the medical center. To the extent that enrollees went to NMC Portsmouth without "good" cause,

it could potentially clog up the system and lead to other enrollees having to be referred to the network directly.

Thus, the "bottom line" for how successful MTF managers have been in reducing leakage from the direct care system would appear to be in terms of the cost per enrollee. This seems to be the simplest and most persuasive evidence that controls may have been in place. We might expect that these costs would be lower in the Portsmouth area.

Interestingly enough, that supposition turns out to be incorrect. Table 58 presents the network costs per enrollee, combining both primary care visits and non-primary-care visits. It shows each of the six clinics' enrollees' costs. Not surprisingly, the PC costs per enrollee are small. Only a small fraction of all visits were observed in the network. We also provide the non-PC costs. In each case, the cost per enrollee at the San Diego area clinics was less than the analogous clinic in the Portsmouth area. The two mainly active duty clinics—the Naval Station and Sewell's Point—showed the smallest per-enrollee cost, but even here, the Naval Station's enrollees' costs were less than a third as much as those of the Sewell's Points' enrollees (admittedly the Naval Stations' enrollees were all active duty compared to about two-thirds active duty at Sewell's).

Table 58. Purchased care costs per enrollee at six clinics (in dollars)

	NTC	Little Creek	Naval Station	Sewell's Point	Clairemont	Virginia Beach
Primary care (PC)	6	15	2	7	6	19
Non-PC	82	157	20	64	125	225
Total	88	172	22	71	131	244

To explore this further, we can examine the percentage of visits that were made in the network for each site's enrollees. Table 59 shows these numbers, broken out for primary care, non-PC (simply the difference between all visits and primary care visits), and all visits. These numbers suggest why the costs are higher. Without exception, the San Diego area clinics have lower percentages of network visits than do their matched clinics.

Table 59. Percentage of enrollee visits going to the network at 6 clinics

	NTC	Little Creek	Naval Station	Sewell's Point	Clairemont	Virginia Beach
PC	1.7	5.8	0.7	2.9	2.1	5.9
Non-PC	11.4	30.5	1.6	8.5	31.6	45.0
All	7.6	20.9	1.3	6.3	15.9	26.3

Perhaps there are good reasons why this may be occurring, including higher per enrollee visit rates, or the need for more complex care, or lower capacity at area MTFs (i.e., at Portsmouth). We can't explore all issues in this report. It would be hard to determine whether excess capacity exists at area MTFs. But, table 60 presents some of this information, on the per-enrollee visit rate and per-enrollee RVU value.

Table 60. Visits and RVUs per enrollee at six clinics

	NTC	Little Creek	Naval Station	Sewell's Point	Clairemont	Virginia Beach
Visits						
PC	3.52	3.76	2.65	3.31	3.35	4.02
Non-PC	5.36	3.94	4.32	4.90	2.87	4.17
All	8.88	7.70	6.97	8.21	6.22	8.19
RVUs						
PC	2.90	3.35	2.76	3.29	2.16	3.34
Non-PC	8.07	5.17	7.11	6.71	4.09	5.47
All	10.97	8.52	9.87	10.00	6.25	8.81
RVUs/visit	1.23	1.11	1.42	1.22	1.01	1.08

The three Portsmouth clinics do have higher primary care visit rates than the corresponding San Diego clinics. Whether that indicates a need to go outside the enrollment site—at the local medical center and ultimately in the network—is less clear. But, to the extent that beneficiaries require (or at least want) more office visits, it's possible the only way to accommodate that need is through the network. Turning to non-primary-care visits, NTC's rate is higher than Little Creek's, which may follow from NTC being the only site with a relatively substantial senior population. At the other two sites, the San Diego clinics have lower non-PC visit rates. In terms of the complexity

of care, we show the RVUs per visit as well as the average RVU per visit (for all visits). The Portsmouth clinics do tend to have higher values of RVUs per enrollee for either PC or non-PC, but some of that is simply because their enrollees have more visits. The last measure, the average RVU, does indicate that there are some slight differences in the average complexity of a visit, but probably not enough to lead to higher network costs.

To sum up, we still have no clear explanation for the higher number of network visits in the Portsmouth area. The MTFs and clinics in this region have a definite incentive to reduce purchased care costs, but we see little evidence of it.

Modeling revised financing

We expected network costs per enrollee to be lower at the Portsmouth clinics than at the San Diego clinics, which are not in a revised financing region. As we've just shown, that is not what we observed. We found that network costs per enrollee were lower at the San Diego clinics than they were for the Portsmouth clinics.

One factor that could explain this result is capacity. If capacity is more limited at Portsmouth than San Diego, a higher percentage of referrals may have to get sent to the network because the capacity to handle more of these referrals in-house doesn't exist. Unfortunately, capacity is not an easy thing to estimate, especially for a specific set of services falling under the primary care heading. Getting a good measure of each location's primary care capacity could easily be a study of its own. Capacity could be measured in terms of manpower, clinicians, physical space constraints, or other resource constraints.

The approach we have taken here is to determine whether there is a difference, measured through a statistical analysis, in the workload between the regions that currently have revised financing and those regions that do not have it. We did this by creating a variable indicating whether an enrollee was enrolled at a site in a revised financing region. We then predicted what the primary care RVUs, outpatient RVUs, and inpatient RWPs would be if each beneficiary were enrolled

at revised financing sites and then if enrolled at a site without revised financing.

Given the incentives that revised financing should create, we expect that a higher percentage of care will be performed in the direct care system than without revised financing. Also, to the degree that revised financing causes primary care providers to limit referrals in general, we expect that total care should be less than without revised financing. Table 61shows our results. Whether we are looking at primary care, outpatient care, or inpatient care, the results are consistent with what we expect. Specifically, more RVUs/RWPs are done in the direct care system with revised financing. Fewer RVUs/RWPs are done in the purchased care system with revised financing. Total RVUs/RWPs are slightly less under revised financing.

Table 61. Predicted annual RVUs and RWPs with and without revised financing

	Direct care	Purchased care	Total
Primary care RVUs			
With revised financing	1.7	0.3	1.9
Without revised financing	1.6	0.4	1.9
All outpatient RVUs			
With revised financing	5.6	1.6	7.2
Without revised financing	5.1	2.1	7.3
Inpatient RWPs			
With revised financing	25.3	17.7	43.1
Without revised financing	18.2	26.2	44.4

For example, the analysis indicates that 1.7 primary care RVUs would occur in the direct care system with revised financing compared to 1.6 without it. In the purchased care system, 0.3 RVU would occur with revised financing compared to 0.4 without it. In total, primary care RVUs would be about 1.9 with or without revised financing. Hence, the statistical analysis indicates that, given the incentives that revised financing creates, it has the kind of impact that we would expect. Again, this is not what we found comparing Portsmouth and San Diego purchased care costs, but there may be other factors, such as capacity driving those findings.

Processes

As specified in the TRICARE Management Authority's *Population Health Improvement Plan and Guide* (December 2001), the following even key process elements of population health improvement have been identified for implementation throughout the MHS.

1. Identify the population
2. Forecast demand
3. Manage demand
4. Manage capacity
5. Evidence-based primary, secondary and tertiary care prevention
6. Perform community outreach
7. Analyze performance and health status.

Within the clinic management assessment methodology, we review elements 2 through 5. Based on our site visits, we have focused our analysis on the management of patient scheduling, records, utilization, and population health and disease oversight initiatives.

Patient scheduling management

The patient scheduling process includes various components working together to drive the efficiency and effectiveness of the primary care clinics. For our purposes, patient scheduling include: demand management, template management, appointment scheduling techniques, no-show management, and access standards. Management personnel at both the NMC Portsmouth and NMC San Diego associated clinics state that managing the patient scheduling process consumes a major portion of their administrative time. In the following,

subsections, we describe each scheduling process component as it relates to the clinics.

Demand management/improvement

The goal of demand management (also known as "demand improvement") is to reduce unnecessary health care utilization while encouraging appropriate use of health care resources.

One specific MTF process that supports demand improvement is maximizing appointment efficiency. This includes providing both central access to advice and appointed care through the phone or in person, and primary care triage systems (such as nurse triage, health information lines, web-based approach, or self-care books). Factors that inhibit demand management practices mentioned by the San Diego clinics are insufficient nursing staff and the requirement that patients insist on being seen even though their condition may not warrant a face-to-face encounter with a provider.

The Portsmouth area clinics use a centralized appointment system managed by the contractor. Clinics report that there is no triage type of function at the contractor level. Beneficiaries typically call the appointment access center and, about 50 percent of the time, are transferred to the local clinic where advice is given or an appointment is arranged.

Each Portsmouth clinic commented that it books most of its own appointments (70 percent of total) and the contractor handles the rest. However, figures provided for October 2002 represented only 45 to 53 percent. It appears that, when the Portsmouth primary care clinic is factored into the overall average (i.e., because of its large volume of patients), the clinic booking rate does average 70 percent. The Virginia Beach clinic remarked that the clinic appointment booking process is primarily staffed by RNs, which is an inefficient use of this resource.

Portsmouth clinics are frustrated by the 24-hour access rule for urgent care. Anecdotally, appointments are available within a couple of hours of the end of the 24-hour-access standard; the beneficiary is

willing to accept them, but the contractor must advise the beneficiary to seek care at the ER.

The Portsmouth area clinics commented that, under the future MCS contracts, the appointment and advice function will be decentralized back to the clinics. It was not clear which model will be considered for this function. Either each clinic will manage its own internal center or a smaller regional center supporting a fixed number of clinics at a centralized location will be formed.

In contrast to Portsmouth, the San Diego-based clinics do not use contractor services for their appointment function. Appointments for the San Diego clinics, Naval Station and Clairemont, are booked directly with the clinic (99 and 92 percent, respectfully). The balance is booked by beneficiaries using TRICARE Online. The NTC has a central appointment number that is used 90 percent of the time; 9 percent of bookings are made directly to the primary care clinic, and the remaining 1 percent use TRICARE Online.

A nurse triage is not available at Naval Station, but the NTC and Clairemont clinics use this function when appropriate appointment slots are no longer available, access standards cannot be met, or patients desiring acute appointments ask to speak to a nurse. In addition, the RNs also invoke clinical practice guidelines, such as dysuria, urinary track infection (UTI), strep throat, and over-the-counter medications in an effort to maximize appointment efficiencies.

NH Camp Pendleton's phone system is located outside the clinic. Patients can book appointments through the Internet with TRICARE Online, by calling the access-to-care center (60 percent are made this way), or via the clinic (40 percent). Appointments made through the clinic are usually for follow-ups. The central appointment system and the message line work together to achieve efficiencies. About 10 messages per provider are received every day or night that require call-back or follow-up. Further call system enhancements at NH Camp Pendleton are not expected because of technology constraints on phone lines.

Currently NH Camp Pendleton uses no formalized triage system. With its advanced access appointment scheduling system, the patient

can request to be seen for any reason on the same day. Nurses in the access center and in the clinic help patients determine if they need to be seen. However, no formalized triage system exists using approved protocols or adequate documentation. NH Camp Pendleton is in the process of purchasing this type of system along with nursing staff.

Industry best practice is to centralize the appointment and advice function or at a minimum, the appointment area with advice decentralized at the clinic level. Further analysis is required to understand why clinics perceive the contractor's appointment booking process to be not functioning to expectation. Possible causes include the following:

- Appointment slots are not available in volume or type to meet population needs
- The nature of the population requires a synthesis of the nurse triage, advice, and appointment processes that is not currently available at the contractor level.

In summary, the clinics' appointment efficiency can be improved. Considerable attention should be given to the availability and management of appointment slots. The appointment slot is analogous to a manufacturing firm's inventory concept. The firm maintains a stock of finished inventory and fill orders as they arrive. Appointment slots are the medical clinic's inventory. As patients demand access to primary care services, an appointment slot is used (filled) when requested. In addition, the availability of appointments is a proxy indicator of the MTF's economic performance. That is, each appointment has monetary value that, if not used, creates undercapacity or, conversely, not enough appointment availability causing patients to seek care at more expensive venues (i.e., urgent care clinic and the emergency department).

Template Management

Template management refers to each clinic forecasting patient visit demand and managing provider capacity to meet beneficiary health care needs. Portsmouth area clinics calculate 4.5 primary care visits per enrollee (per year) with modifications for no-shows and cancellations to forecast visit demand for their beneficiaries' medical needs.

This demand forecast is then matched to the available provider appointments. Each clinic devoted significant daily administrative time in arranging and updating the appointment template.

Clinics in the San Diego area tended to match the number of appointments to a provider's clinic availability. Each of the clinics in San Diego make daily adjustments to templates as necessary, based on history, patient demand, and time of day (i.e., increasing "well" appointments in the summer and "acute" appointments in the winter). In addition, Clairemont always builds in school physical slots in the fall.

Each clinic matches expected demand with appointment supply based on internal heuristic approaches. The use of 4.5 visits per enrollee may not always capture the nonenrollee (or ghost population) demand. No evidence of a more sophisticated modeling technique in forecasting demand and managing capacity at the clinic level was observed.

Each clinic used template analysis tools in varying degrees to assist in managing appointments prospectively and to ensure efficient and effective use of capacity.

NH Camp Pendleton's Family Practice Department has some form of advance access appointment scheduling. That is, a large number of open appointments are available at the beginning of the day. These appointments can be used for any type of visit, not just acute or urgent care. Patients who call and request an appointment are given one. There is no triage per se. Ifa patients are not sure they need to be seen, they can speak with a nurse in the access -to-care center or a nurse in the clinic. Providers use the telephone to manage stable patients who may not need to visit the clinic.

The clinic manager reviews the templates on a regular basis to determine what types of appointments are needed. Most clinics use only "acute," "est," "well," and "opac" appointments in their templates. During the winter cold and flu season, more appointments are "acute" or "opac." During the summer, more "est" and "well" appointments are available. In addition, the clinic business managers monitor availability on a daily basis and may use provider administration time for patient care if patient needs are outstripping availability.

Appointment scheduling

As previously mentioned, the majority of patients schedule their appointments by phone, some by walk-in, and in San Diego very few use the recent TRICARE On-line option. The MTF clinic patient scheduling techniques observed in Portsmouth and San Diego mirrored industry standards. Most civilian practices follow either the traditional or carve-out models, with a few practicing advanced access.

In a traditional model, the provider goes to the office each morning and the schedule is booked in advance. Same-day and urgent care cases are either piled on top of existing appointments or deflected to urgent-care centers or the emergency department. In a carve-out model, appointment slots are either booked in advance or held for same-day urgent care. Same-day nonurgent requests are deflected into the future. In the advanced access model, the majority of appointment slots are open for patients who call that day for routine, urgent, or preventive visits.

Across both Portsmouth and San Diego clinics, consistent methods (i.e., carve-out model) for scheduling with slight modifications were applied. In the Portsmouth area clinics, nine appointment types are available for booking with four or five used in the majority of cases. The San Diego NMC clinics typically use four types of appointments for booking purposes. Clinics should strive to use the least number of appointment types available. Having many appointment types actually increases the total delay in the system because each appointment type creates its own differential delay and queue. In addition, each appointment type creates its own inclusion and exclusion criteria (i.e., each appointment type requires its own criteria to determine who gets in and who does not).

Appointment utilization at Virginia Beach shows that 94 percent of appointments are used. However, the unbooked appointments reveal significant variability by month. Virginia Beach expressed interest in expanding its scheduling method to open access—that is, to reduce appointment types to three and provide more open appointments at the start of each day.

At NH Camp Pendleton, the official policy is that walk-ins are not normally encouraged. If a patient walks in and requests to be seen, clinic staff members do their best to give the patient an appointment that day and to educate him or her on the importance of calling for an appointment. Since the reported phone call abandonment rate in the access center is very low (less than 2 percent), the vast majority of calls are answered in a timely manner allowing for easy scheduling of appointments. Patients who want to be seen, however, are not turned away. They may have to wait a considerable length of time for their appointment.

Because of the residency program and nonphysician providers providing patient care, appointment lengths vary based on skill level. Staff and third-year residents have 15- or 30-minute appointments, FNP and second-year residents have 20- or 40-minute appointment, and PAs and first-year interns have 30- or 60-minute appointments. NH Camp Pendleton has created two simple appointment types: "long," which is 30 minutes or more and "short" usually 15 or 20 minutes. Appointments can be combined as needed.

Appointment utilization is tracked daily through template management and monthly through reports including the volume of direct care visits, average appointments per hour, appointment type (i.e. available, booked and open).

No-show management

Significant differencse in no-show management approaches are evident between regions and among clinics. The Portsmouth clinics have no policy on dealing with no-show patients and do not directly contact patients (via phone or letters), even repeat offenders. Indirect efforts, such as signs in the clinic, are nonexistent. Virginia Beach commented that they are aware of the repeat offenders and typically will book around them. They also place 100 percent reminder calls to their population. Virginia Beach clinic's self-reported no-show rate averages around 11 percent, whereas Little Creek varies between 10 and 16 percent, depending on the season.

In contrast, each San Diego clinic has a no-show management policy. At the NTC, documentation is placed in front of providers, who

decide whether a patient needs to be(a) contacted to come in or (b) offered another appointment. The NTC reports few chronic no-show patients. For those active duty patients who are no-shows at Naval Station, their names are submitted to the CO of the base and patients are contacted by the CO's office, which asks them for an explanation. Naval Station also reported few chronic no-shows. Clairemont calls all "well" appointments at home and offers to reschedule if necessary. For chronic no-shows, patients are contacted via letter encouraging them to keep their appointment. In addition, Clairemont uses historical patterns to estimate the number of no-shows. It does this by day of the week, hour of the day, and appointment type. Such forecasting enables them to manage no-shows more effectively than they otherwise could.

NH Camp Pendleton has a self reported no-show rate of about 8 percent. By civilian standards, this is very low. The low no-show rate can be attributed to the performance improvement projects where patients were called for their "est" and "well" appointments 1-2 days ahead and reminded. This small no-show rate gives the opportunity for a provider to see an occasional walk-in patient or spend more time with a complicated patient.

The civilian sector targets a no-show rate of less than 5 percent as ideal, but missed appointments have been documented to range from 3 to 80 percent,[22] with rates usually about 15 to 21 percent. Typical civilian practices include (a) use of automated reminder systems, (b) reduction of provider's time to next available appointment, (c) use of advanced access scheduling, and (d)creation and enforcement of a no-show policy on repeat offenders.

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22. Rust, C.T., et al. "Patient Appointment Failures in Pediatric Resident Continuity Clinics." *Arch Pediatric Adolesc Med* 1995, 149(6):693-5; Kendall, C., et al. "The Relative Effectiveness of Three Reminder Letters on Making and Keeping Mammogram Appointments." *Behav Med* 1993; 19:29S-34S; and Hixon, A., et al. "Failure to Keep Clinic Appointments: Implications for Residency Education and Productivity." *Fam Med* 1999, 31(9):627-30.

Access standards/unmet needs

All the clinics measured reported and adhered to the access standards. The current standards are:

- 24 hours for urgent care
- 7 days for routine care
- 4 weeks for well-care visit
- Referrals to specialists, as appropriate, generally no longer than 4 weeks.

Both Portsmouth and San Diego aggressively manage their templates to meet access standards.

Tracking unmet patient needs provides clinics with a performance measure regarding access to services. At each San Diego clinic, patients' unmet needs are tracked by customer and staff satisfaction surveys, and front desk and HMC community feedback. In addition, at the NTC, call volume is monitored and patients dissatisfied with care, service, or access are referred to the nursing staff for resolution. No daily tracking system is in place to measure the number of patients requesting an appointment who are unable to obtain one.

At NH Camp Pendleton, one key benchmark reviewed on a daily basis is the unmet patient needs. This occurs when a patient calls for an appointment and cannot get one. The goal is to have less than 10 per day for all Primary Care departments combined. In the fourth quarter of FY02, unmet appointment needs were 3.5 percent of the daily available appointments (or on average of 2 per day)—a significant decrease from the 14 percent reported for first quarter FY02. This drop was caused by an increase in the availability of daily appointments offered. Other benchmarks reviewed include access standards for the standard appointment types, the number of visits per clinic, and patient satisfaction as measured by the DOD satisfaction survey.

Record management

The MHS is an ideal organizational candidate for automated medical records. The size of the beneficiary population, 8.7 million, and the fact the population is quite mobile provide a sound cost justification for automating medical records.

The facility space used to house the medical records could be utilized for care delivery. Additionally, the risk of lost medical records is costly. For example, active duty military personnel must have all immunizations and inoculations repeated.

Currently, the medical records are paper based and the active duty beneficiary or dependent must physically pick up and hand carry the medical records. An initiative is under way in cooperation with the Veterans Administration and Indian Health Services to develop a government computer-based patient record system (GCPR). The estimated roll-out date for this initiative is 2005.

Utilization management

We discussed the management of referrals with the clinics. Referrals from the primary care departments were sent to respective hospitals. As a result of contract financing methodology, two separate approaches were observed in each region. The Portsmouth clinics had accountability measures in place at the clinic level to track referral utilization to the hospital. In contrast, the San Diego clinics placed less significance on referrals.

In general, emergency department referrals were either self-referred or, in Portsmouth's case, referred by the contractor because of the lack of appointment availability.

Virginia Beach tracks referrals on a monthly basis. The top five referrals are orthopedic, dermatology, gynecology, ENT and surgery. In addition, Virginia Beach performed 100 percent follow-up for patients who incurred an ER visit to recapture any post treatment needs, for patient education purposes and service improvement opportunities.

At the San Diego clinics, patients are referred to the hospital with the referral center coordinating the care. Frequent referrals to the hospital are unknown for the NTC and Naval Station clinics. Clairemont reported that the Senior Medical Officer tracks referrals but was unable to provide specific data on what type of referrals are sent to the hospital.

Referrals are centrally managed by the hospital and will be returned to the Family Practice Department if the referral is judged not appropriate. NH Camp Pendleton has an internal database that track referrals, including requests for physical therapy, occupational therapy, nutrition evaluation and case management that do not necessarily require referral outside the Navy system. In FY01 NH Camp Pendleton's referral rate was 17 percent. This is calculated by the number of referrals provided per MEPRS countable visits. In FY02, the referral rate slightly improved to 16 percent of primary care visits. Camp Pendleton's top five referrals to specialty clinics are Orthopedics/ Sports Medicine, General Surgery/Breast Care, OB/GYN, Cardiology, and Dermatology.

Population health and disease management initiatives

Population health and disease management (PHM) shift the health delivery focus upstream, before the patient needs medical attention. PHM programs identify health risks and implement clinical and educational interventions designed to prevent or minimize the need for downstream consumption of medical services. The main components of PHM are:

- Identify health risks within a group or population.
- Design and implement interventions appropriate to the morbidity of each group;.
- Educate the members of each group on healthy lifestyles.
- Reduce the demand for medical services.
- Improve the overall health of the population.

We found PHM efforts underway at each of the clinics we visited. The clinics had developed or were in the process of developing programs based on their populations.

Portsmouth area

Given a primarily active duty population, Sewell's Point identified the need for a sports medicine clinic. The clinic is being funded under the MTF Optimization initiative.

Little Creek also identified the need for a sports medicine clinic because of the large transient student population that it supports , and a Preventive Health Assessment program was initiated. In addition, Little Creek implemented rotational specialty clinics for dermatology, ENT, internal medicine, and clinical psychology.

Virginia Beach implemented a nurse managed clinic to ensure that the care it provides is at the appropriate level and to support follow-up care. Virginia Beach identified the need for a sports medicine clinic and also hosts specialty clinics, such as back to school immunization days.

San Diego area

Naval Station and NTC conduct Preventive Health Assessments and screens for high blood pressure and cholesterol. The clinics offer smoking cessation, remedial fitness training, obesity classes, healthy lifestyle classes, stress management, and time management. The clinics also offer programs in diabetic education, coumadin clinics, asthma management, and cardiac rehabilitation.

Clairemont offers classes for smoking cessation and weight management. Clairemont has a diabetes program in place and plans to implement a teledermatology program. The telemedicine program is coordinated through the MTF.

NH Camp Pendleton has focused for the last year on developing chronic disease registries to help manage patients with diabetes mellitus, asthma, and congestive heart failure. These databases pull data from CHCS and ADM to help providers and nursing staff proactively

manage patients in these risk categories. Recently, the second version of the diabetes registry was unveiled and is going through clinician trials.

NH Camp Pendleton has also done population health work aimed at improving mammography screening, influenza vaccination, and hormone replacement therapy.

In addition to the programs outlined, the clinics offered standard wellness programs and counseling. The clinics were attuned to their populations and were responsive in implementing appropriate programs.

We reviewed the top five diagnoses at each clinic site to verify the appropriateness of PHM program emphasis. Overall, counseling and general medical exams for the general population, including woman's health and infant and children, were the top diagnosis codes for the clinics. This seems to confirm the applicable need for preventive health assessment and standard wellness and counseling programs offered by the clinics.

Summary

Across all clinics, we found management and staff members who were highly motivated and wanting to deliver exceptional health services and support the mission of the DOD. Clinic management within the MHS has a unique balance of readiness and benefit that must be maintained. This balance places constraints on clinic management. The sites have common issues surrounding labor mix, facilities, and data and unique issues surrounding regional managed care support contracts. The management teams in San Diego and Portsmouth have taken different approaches to organizing and managing their respective clinics to best support their situational circumstances.

The management teams have creatively optimized patient flow despite:

- The physical constraints of facilities originally designed for solely inpatient or outpatient services

- The challenges of aggressively managing complex templates to accommodate the patient population
- The drive to implement current trends in demand management and population improvement.

These efforts are conducted under a foundation of a high personnel turnover, a highly mobile enrollee population, complex data structures, and limited space and funds. We have considered these aspects in qualitatively evaluating the clinics' performance.

The common areas of potential improvement that we found include:

- *Improve data capture, accuracy and consistency.* It is imperative to have sound data to effectively administer a clinic. Given the mobility of personnel and enrollees in the MHS, this is even more important. The data capture and accuracy of resource accounting must be improved as well as the data accuracy of patient care delivery. As the MHS consider per capita and other variations of budgeting and fiscal management, the need for complete and accurate data is an essential requirement. Continued support (funding, training, and feedback) for accurate diagnosis coding that provides critical insight to performance and resource support requirements for providers is essential.
- *Emphasize staff training and turnover transition management.* The high turnover in personnel is a by-product of the dual mission and is difficult to control. Sound training programs for key positions are critical. Personnel assigned to new positions should be evaluated by the clinic management and feedback provided to the training programs to illuminate areas of the training that may need improvement.
- *Use consistent no-show management strategies across clinics and regions.* No-show appointments carry a heavy cost to the system. Each clinic and region has a slightly different approach to managing the issues. An MHS-wide policy will assist in developing beneficiary expectation and reducing no-show appointments.
- *Continue to optimize appointment efficiency through improved methods of forecasting clinic demand and reducing the number of appointment*

booking types. Developing suitable forecasting models (either regionally or locally) that can be used at the clinic level may provide administrative staff additional information to plan and manage their appointment templates and to ease the daily administrative burden. Decreasing the number of appointment types offers patients improved access to providers and may save resources by reducing telephone transfers manned by RNs to the primary care departments.

Some of the site-specific areas we recommend for improvement include the following:

- *Improve Portsmouth's central appointment booking system provided by the MCSC contractor*. It is our understanding that this will be remedied with the new MCSC contracts.
- *Improve San Diego's referral tracking process*. No tracking process is in place for referrals to determine the appropriate referral of care to the NMC and the network. It was our understanding that the DHOP was in the process of developing a Consult Management Center to track referrals, determine appropriateness, and provide feedback to the referring providers.

Conclusions and recommendations

Our analysis of the primary care clinics in Portsmouth and San Diego and the FP clinics at Jacksonville and Camp Pendleton has focused on the following:

- Developing appropriate productivity measures
- Determining appropriate cost measures for both direct and purchase care
- Examining the clinics' role in the demand for care
- Documenting our understanding of how the clinics are currently managed.

Findings

Developing appropriate productivity measures requires accurate measures for both workload and staffing. In doing this, we've found the following:

- Workload measures from the M2 generally agree with what the clinics reported both in terms of visits and RVUs.
- Staffing estimates as measured by FTEs, however, generally differ with what the clinics report for FTEs. Specifically, total FTEs from EAS IV and what was reported by the clinics differed substantially for the Naval Station and Naval Training Center. The differences were not only in the totals, but the mix, in terms of provider sources (military, civilian, or contactor) and types (physicians, NPs, or PAs). This further erodes our confidence about how accurately FTEs have been captured.
- Relatively small differences in FTE estimates can change the implications of whether clinics have been very productive or

not. Hence, reported productivity estimates are only as good as the data on which they are based.

- Using a simple panel size (enrollees per FTE) can result in a misleading picture. MTFs and clinics provide care to beneficiaries other than their own enrollees, and these enrollees may get some of their care elsewhere. Also, the demographics of enrollees vary significantly from clinic to clinic. Hence, what we've called the effective panel size, which takes account of how much care enrollees receive locally as well as demographic differences, provides a better basis for comparison across clinics.
- With the exception of NH Camp Pendleton, our dicussions with clinic managers indicate a pervasive lack of confidence in MEPRS accuracy in terms of correctly reflecting the clinics' FTEs.

Although clinic productivity was an important focus of this study, it is also important to know how productivity affects the bottom line, i.e., cost. In our exploration of cost, and in discussions of cost with people at TMA and BUMED, we found the following:

- TMA has computed or allocated costs to each outpatient visit, it is difficult to know exactly what this cost really includes and its usefulness is often disputed.
- In terms of accurately estimating costs, we find that *direct expenses* are too low because they include only the costs directly attributable to a specific (3- or 4-digit MEPRS) clinic and not the costs that are allocated across multiple clinics. Similarly, *total expenses* are too high because they include step-down costs for such items as pharmacy costs, which are not a cost of a purchased care office visit.
- Given the problems with both direct and full cost, we estimated the average cost of a visit at each clinic. We used a method that we believe is reasonable based on discussions with people at TMA and BUMED. Even using this average cost measure, the cost per visit varied substantially across the clinics.
- In general, the average cost per visit by clinic enrollees was higher in the direct care system than when they received similar

care through network providers and facilities (i.e., in the purchased care system). And, when we looked at the cost of the visit corrected for complexity through the RVU, the difference between the direct and purchased care systems became even greater.

- Related to cost was the issue of revised financing. During our clinic visits, we found that the Portsmouth-area clinics placed a substantial focus on referrals because of their responsibility for all enrollee costs as part of the regional managed care support contract. However, we did not observe this same focus in San Diego, which does not operate under this type of contact.
- As a result of revised financing, we expected to see lower network costs per enrollee in Portsmouth than in San Diego, but the opposite was true. In general, after exploring this issue more widely throughout the MHS through a statistical analysis, we found that revised financing across the MHS slightly increases direct care workload, slightly decreases purchased care workload, and slightly decreases overall workload. But, this more general finding does not help us explain why we found higher purchased care costs per enrollee in the Portsmouth area.

In addition to productivity measures, we looked at the role clinics play in the demand for care by their enrollees. We found that:

- More intensive use of primary care may lead to less specialty care because problems were treated and/or prevented in the primary care setting.
- Just looking at the primary care visits per enrollee as a means of comparison between clinics may lead to faulty conclusions if more primary care leads to less specialty care.
- There are differences across the sites pertaining to how well the sites generally manage both inpatient and outpatient care to their enrollees.

In studying how the clinics are managed, we found the following:

- Clinic managers were highly motivated and wanted to deliver exceptional health services and support the DoD mission.

- Clinics with mostly active duty providers and enrollees operated under the most severe constraints. Potential deployments and the collateral duties of active duty providers make managing manpower difficult. These clinics also deal with a lot of sailors who are enrolled to ships or other MTFs. In contrast, the TRICARE clinics had mostly civilian or contract personnel and treated a more stable active duty dependent population, which makes these clinics easier to manage because they don't operate under the same constraints.
- Clinic management worked to optimize patient workflow given significant differences in facility layouts, aggressively managed complex templates to meet demand, and managed no-shows.

Finally, although our visits to the clinics and the information we received was helpful, it was not easy obtaining the information and the follow-up necessary to get it was very time-consuming, both on our part and theirs. Therefore, although we would argue that it was still useful in our study, management of the system requires that the standard sources of data be reliable and usable. Relying on the clinics to use their valuable time to correct mistakes in standard data sources will almost certainly mean that it won't be done system-wide, and the data ultimately used to understand system productivity and cost will be flawed.

Recommendations

Based on our analyses of the clinics' productivity, costs, demand, and management, we recommend the following:

- Improve the accuracy of staffing data. The system can't be effectively managed if there are questions about whether what we observe really reflects what is occuring in the clinics.
- The requirement for monthly MEPRS complaince seems insufficient. It's difficult to remember how you spent your time a few days ago; it's extremely unlikely that once-a-month accounting will accurately capture patient care time allocation. We recommend that providers be held accountable for accurate time-

keeping and that the timekeeping process be enhanced by moving to a web-based system for daily entry.

- Develop and make readily available in the M2 a cost measure that people can agree on as an accurate reflection of costs in the direct care system.
- Evaluate staffing training and turnover/transition management. Sound training programs are critical. Personnel assigned to new positions should be evaluated by the clinic management and feedback provided to the training programs to illuminate areas of the training that may need improvement.
- Develop a consistent no-show management policy across the system to develop a common beneficiary expectation about what is expected of them. Though both Portsmouth and San Diego clinics deal with no-shows, San Diego clinics had more aggressive practices in place to reduce them.
- Improve the appointment booking system in Portsmouth to reduce the amount of clinic staff time spent booking appointments.
- Improve the referral tracking system and monitoring process in San Diego to limit unnecessary referrals. This will be particularly important when San Diego begins operating under a revised financing contract, which is due to happen sometime in 2004.

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