

| 1. AGENCY USE ONLY (Leave blank) | 2. REPORT DATE | 3. REPORT TYPE AND DATES COVERED |
|---|---|---|
| | December 1992 | Final Report (07-91 to 07-92) |

**4. TITLE AND SUBTITLE**
Provider-Line Ancillary Service Support: A Study of Performance and Cost Data

**5. FUNDING NUMBERS**

**6. AUTHOR(S)**
CPT Bonnie M. Murdock, MS



**7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)**
Darnall Army Community Hospital
Fort Hood, TX
76544-5063

**8. PERFORMING ORGANIZATION REPORT NUMBER**
15A-92

**9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)**
U.S. Army-Baylor University Graduate Program in Health Care Administration
Academy of Health Sciences, U.S. Army (HSHA-MH)
Fort Sam Houston, TX 78234-6100

**10. SPONSORING/MONITORING AGENCY REPORT NUMBER**

**11. SUPPLEMENTARY NOTES**

**12a. DISTRIBUTION/AVAILABILITY STATEMENT**

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

**12b. DISTRIBUTION CODE**

**13. ABSTRACT** *(Maximum 200 words)*

**14. SUBJECT TERMS**

**15. NUMBER OF PAGES**
85

**16. PRICE CODE**

| 17. SECURITY CLASSIFICATION OF REPORT | 18. SECURITY CLASSIFICATION OF THIS PAGE | 19. SECURITY CLASSIFICATION OF ABSTRACT | 20. LIMITATION OF ABSTRACT |
|---|---|---|---|
| N/A | N/A | N/A | UL |

# PROVIDER-LINE ANCILLARY SERVICE SUPPORT:

# A STUDY OF PERFORMANCE AND COST DATA

A Graduate Management Project

Submitted to the Faculty of

Baylor University

In Partial Fulfillment of the

Requirements for the Degree

of

Master of Health Administration

by

Captain Bonnie M. Murdock, MS

July 1992





Running Head: PROVIDER-LINE PERFORMANCE DATA

TABLE OF CONTENTS

LIST OF TABLES

## ACKNOWLEDGEMENTS

I would like to acknowledge the wisdom of my preceptor, Colonel H. Michael Case, in giving me the opportunity and the freedom to learn. I would also like to acknowledge the support of Lieutenant Colonel Thomas E. Leonard in all aspects of this project and my residency year.

## Abstract

Under the Department of Defense (DoD) Coordinated Care Program (CCP), reliable cost data become more important than ever. Decentralized cost accountability rationalizes the need for a single framework for average and total costs, and increases the need to know provider-line costs. It becomes appropriate to ask, how accurate are the data on which cost analyses rest? This study framed this question in light of wide disparity in reported ancillary service performance data and increasing Partnership provider productivity at Darnall Army Community Hospital (DACH).

The subject of this study was the distribution of ancillary service data for MEPRS summary accounts with multi-provider lines; and the accuracy of cost analyses based on these data. Ancillary service requests from a clinical department were audited for provider-line and procedure data (raw count and weighted value) for one reporting period. Provider-line ancillary service performance distribution, based on this audit, was compared to the distribution reflected in the comparable MEPRS summary account. Average ancillary service cost were computed based on the results of the tabulation. The delta between average ancillary service cost based on ancillary service data summaries and average costs derived from the audited service requests was reported.

# Introduction

## The Coordinated Care Environment

### Cost Data as the Sine Qua Non of Coordinated Care

From the perspective of the local medical treatment facility, the most important principle of the Department of Defense (DoD) Coordinated Care Program (CCP) initiative may well be that which gives commanders of medical treatment facilities (MTF's) "responsibility for the health care costs, quality, and access in their local delivery area for all beneficiaries" (Assistant Secretary of Defense (Health Affairs), 8 January 1992, p. 2). While a single yardstick for measuring performance against these inter-linked criteria has not been developed, rudimentary attempts to measure performance of this responsibility will depend, in no small part, on the analysis of locally-produced data. As delivery options complexify and quality and access standards are refined, the need for reliable data is sure to become greater.

While no element of the cost, quality and access triad can or should be considered in isolation, cost is the most quantifiable (i.e., databased) at the operational level so as to be useful as a basis of comparison, and even cost data will be challenged as a basis of facility comparison while adjustments for differences in facility mission are not yet explicit. However, for the foreseeable future, cost data are

likely to provide the basis by which performance is measured, and by which facilities are compared. One can expect the cost-output relationship to be analyzed with increasing rigor in the Coordinated Care environment. Productivity data will continue to be the denominator of success.

Cost, it should be stressed, is a malleable concept. Marginal cost, for example, may be difficult to compute in a meaningful way at the facility level, given the interrelationship of the many products and services which the hospital delivers; but total costs and average costs per unit of service (between and within health service areas) can be determined from available databases without particular difficulty. One can predict that increasingly-refined cost-output models, relating the volume of raw and weighted products to average costs and total costs, will be used to evaluate delivery options at the local level. Total cost behavior and graphs of average cost per unit of service also can be expected to be used by major command managers to evaluate facility performance.

Cost savings, of course, is the consideration on which future DoD health care policies are likely to turn. Witness the statements made by the Assistant Secretary of Defense for Health Affairs in opposing continuation of the CHAMPUS (Civilian Health and Military Program of the Uniformed

Services) Reform Initiative (CRI) in favor of CCP. Secretary Mendez told Congress that DoD "numbers showed the increase in costs for the reform program in fiscal 1991 was 14%, compared with 13% for CHAMPUS overall" (Weissenstein, 1992, p. 14). Even more significantly, costs for CRI were projected to rise 15% this fiscal year, while overall CHAMPUS costs were expected to rise only 4% (Weissenstein, 1992).

Notably for this study, the Secretary quoted DoD data to justify his position, ignoring contradictory data from a Rand Corporation study (which showed that CRI costs rose 2%, while overall CHAMPUS costs rose 16%) (Weissenstein, 1992). A better argument can scarcely be made for the importance of cost data generated by local medical treatment facilities.

## Evolution toward a Single Cost-Output Framework

Under CCP, compartmentalized responsibility for direct and indirect costs, and fragmented responsibility for cost control, has been replaced by the concept of decentralized accountability in the hands of the local commander. Where it was once useful to conceptualize indemnity (CHAMPUS and its derivatives) costs and direct care (MTF) costs separately, it is now useful to conceptualize a single framework for the health service area, with dollars on the vertical scale and production data on the horizontal scale. Ideally, the total variable cost curve would reflect the volume of both fee for

service (CHAMPUS-paid) and incremental cost (budgeted by the MTF, and dependent on case mix, severity of illness, incentives for resource use, etc.). Again ideally, the total fixed cost curve would include MTF capital investments, depreciation, and overhead for coordinated care and the MTF; and its position would reflect the quality, technological level, scope and resource intensity of MTF services.

A rationale for conceptualizing costs in a single framework can be found in the evolution of DoD guidance pertaining to the DoD Military-Civilian Health Services Partnership Program. This was the precursor of an integrated approach to health care delivery within the Military Health Services System (MHSS). It is instructive to review the guidance pertaining to this program on the threshold of coordinated care implementation.

Initial guidance creating the Partnership Program, under which private practitioners operate inside military medical treatment facilities, was outlined in DoD Instruction No. 6010.12 on October 22, 1987. Known by its abbreviated title, the Partnership Program was officially intended "to make health care services more available to health care beneficiaries using the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS)" (Office of the Secretary of Defense (Health Affairs), 1987, p. 1). In economic terms,

however, it created a multi-provider line for CHAMPUS services. The Partnership service lines, operating at negotiated discounts, were intended to reduce the slope of the total variable cost curve in the CHAMPUS total cost picture. By omitting mention of any impact on MTF costs, this guidance implicitly treated MTF costs as fixed, and assumed that average fixed costs would fall as they were spread over increased output from additional providers. It did not reflect an awareness that the Partnership Program was also, in effect, creating multi-provider lines within fixed facility departments, or what the cost impact of these might be. Paragraph 4.b.(3) of the instruction holds the Commander responsible for ensuring merely that the "health care resources to be provided are consistent with the level and type of health care resources generally provided by the MTF" (Office of the Secretary of Defense (Health Affairs), 1987, pp. 1-2).

Two years after the inception of the Partnership Program, during which the cost shift from civilian providers to the government was beginning to be reflected in the government's stiffening position on negotiated discounts (Egmon, personal communication, 1992), a memorandum was issued which expanded the responsibilities of the MTF Commander outlined in paragraph 4.b.(2) of the original DoD instruction.

Specifically, the new guidance read as follows: "negotiated discounts should also take into account any incremental increase in MTF costs for ancillary or administrative support resulting from the Partnership agreement" (Office of the Secretary of Defense for Health Affairs, 1989, p. 1). A format guide was provided for justification for initiation/renewal of a Partnership Program Agreement. Paragraph 3g of the format guide stated: "For new and renewal agreements, state the cost impact, if any, of the agreement on existing hospital services. . . " (Office of the Secretary of Defense for Health Affairs, 1989, unnumbered). This reflected an implicit understanding at the policy-making level that Partnership Program implementation has the potential to increase the slope of the MTF total cost curve, either by shifting the fixed cost curve (representing increased overhead) or by increasing the slope of the variable cost curve (representing increased ancillary service use and the impact of diseconomies of scale).

CCP guidance, issued in final form in January 1992, brings to fruition the rationale for a single cost framework. If it does not give local commanders desired programming authority between CHAMPUS and direct care budgets, it holds them unequivocally responsible for total health service area costs. No doubt, division of programming authority will

continue to develop over the three-year phase-in period. However, it is from the position of a unified cost framework that the local commander can and ought to begin to examine all extant health care delivery options, based on available data.

Given the rationale for viewing costs in a single analytic framework; that average and total cost behavior will be the measure of success under CCP; and that cost savings is perhaps the central factor in health care policy decisions; it is not inappropriate to ask, how accurate are the productivity data on which cost analyses rest? This has implications at levels where delivery options are compared, performance is evaluated, and policy decisions are made.

## Conditions which Prompted the Study

### The Quality of Local Performance Data

Local ancillary service summary reports, particularly those for ambulatory clinics where private clinicians (under the auspices of the Partnership Program) practice alongside military providers, raised concern about data accuracy.

While local cost analyses showed that ancillary services represented a preponderance of the cost an ambulatory visit (Leonard, 1992), ancillary service data summaries revealed a very wide disparity in the weight and volume of ancillary services ordered by provider categories. This was so for several ambulatory clinics at (DACH), as Tables 1 and 2 show.

Table 1

Raw Count of Ambulatory Ancillary Services

First Quarter FY 92

| | Clinical Pathology | Anatomical Pathology | Pharmacy | Diagnostic Radiology |
|---|---|---|---|---|
| Int Medicine | | | | |
| military | 21040 | 37 | 12592 | 760 |
| Partner | 4 | 68 | 0 | 0 |
| Allergy | | | | |
| military | 846 | 0 | 1285 | 214 |
| Partner | 265 | 0 | 5155 | 0 |
| Dermatology | | | | |
| military | 750 | 3051 | 2478 | 16 |
| Partner | 12 | 48 | 470 | 0 |
| Ophthalmology | | | | |
| military | 90 | 24 | 760 | 52 |
| Partner | 11 | 0 | 183 | 0 |
| Gynecology | | | | |
| military | 4789 | 14772 | 4226 | 388 |
| Partner | 22 | 1654 | 1920 | 7 |
| Obstetrics | | | | |
| military | 45162 | 5 | 3021 | 1247 |
| Partner | 0 | 0 | 743 | 0 |
| Wmen's Hlth(OB) | | | | |
| military | 50 | 0 | 0 | 0 |
| Partner | 0 | 0 | 0 | 0 |
| Wmen's Hlth(GYN) | | | | |
| military | 0 | 0 | 0 | 0 |
| Partner | 0 | 0 | 0 | 0 |
| Pediatrics | | | | |
| military | 18624 | 0 | 12333 | 1038 |
| Partner | 12 | 0 | 6427 | 0 |

(U.S. Army Medical Activity, Fort Hood, TX, 1992).

Table 2

Weighted Ancillary Service Procedures

First Quarter FY 92

| | clinical path | anatomical path | pharmacy | radiological |
|---|---|---|---|---|
| Int Medicine | | | | |
| military | 66952.0 | 189 | 12592 | 7830 |
| Partner | 4.4 | 414 | 0 | 0 |
| Allergy | | | | |
| military | 4081.0 | 0 | 1285 | 1212 |
| Partner | 469.7 | 0 | 5155 | 0 |
| Dermatology | | | | |
| military | 2922.0 | 18348 | 2478 | 52 |
| Partner | 34.3 | 282 | 470 | 0 |
| Ophthalmology | | | | |
| military | 445.3 | 182 | 760 | 809 |
| Partner | 47.1 | 0 | 183 | 0 |
| Gynecology | | | | |
| military | 19021.3 | 54389 | 4226 | 3122 |
| Partner | 49.5 | 10015 | 1920 | 43 |
| Obstetrics | | | | |
| military | 161556.2 | 33 | 3021 | 11886 |
| Partner | 0 | 0 | 743 | 0 |
| Wmen's Hlth(OB) | | | | |
| military | 302 | 0 | 0 | 0 |
| Partner | 0 | 0 | 0 | 0 |
| Wmen's Hlth(GYN) | | | | |
| military | 0 | 0 | 0 | 0 |
| Partner | 0 | 0 | 0 | 0 |
| Pediatrics | | | | |
| military | 55562.9 | 0 | 12333 | 4241 |
| Partner | 72 | 0 | 6427 | 0 |

(U.S. Army Medical Activity, Fort Hood, TX, 1992).

## Ancillary Service Reporting

### Medical Expense and Performance Reporting System (MEPRS)

By DoD policy, fixed military medical treatment facilities use the Medical Expense and Performance Reporting System (MEPRS) to support expense and performance accounting and reporting, such as the performance and cost analyses above. At its core, MEPRS is a chart of accounts, designed to standardize medical workload and expense accounting and reporting methodologies within the Military Health Services System (Office of the Secretary of Defense (Health Affairs), 1986).

MEPRS standard account codes. Under MEPRS, each standard account is identified by a four-position, alpha-character code. The first character (first level) of the code identifies one of six functional categories, viz., inpatient; ambulatory; dental; ancillary; support services; and special programs. Two of these functional categories - ancillary and support services - are intermediate operating expense accounts, which (using step-down methodology) are distributed to final operating expense accounts, i.e., the other four functional categories. Distribution is based on performance factors for each intermediate expense account (Office of the Secretary of Defense (Health Affairs), 1986).

The second character (second level) of the code

identifies a summary account (Office of the Secretary of Defense (Health Affairs), 1986). For practical purposes, summary accounts are comparable to clinical departments. Within the functional area of ambulatory services, eleven MEPRS summary accounts are specified, seven of which are reflected in clinical departments at Darnall Army Community Hospital: obstetrical and gynecological care (the subject of this study); medical care; surgical care; pediatric care; orthopedic care; psychiatric/mental health care; primary medical care; and emergency medical care.

The third position (third level) of the code refines the summary account into a subaccount or work center. Work centers, as described in Chapter 2, DoD 6010.13-M, comprise the chart of accounts for the MTF (Office of the Secretary of Defense (Health Affairs), 1986). Work centers prescribed and in use at Darnall Army Community Hospital for the obstetrics and gynecological care summary account are, not unexpectedly, two, viz., gynecology ("BCB") and obstetrics ("BCC") (U.S. Army Medical Activity, Fort Hood, TX, 1992).

Provider-line expense reporting. The fourth level of the code is non-standardized; it is available for use at the local level "to enhance the utility and flexibility of the account code structure" (Office of the Secretary of Defense (Health Affairs), 1986). In effect, it is available to support local

information requirements about provider-line performance and expenses within clinical department work centers. This is how its use can be characterized at Darnall Army Community Hospital (U.S. Army Medical Activity, Fort Hood, TX, 1991).

Sample study. That contradictory work center identification data elements on ancillary service requests may be implicated in reported disparity between provider lines was recently tested. A one-day sampling of all clinical pathology service request forms from the Department of Obstetrics-Gynecology outpatient clinics was obtained. First, the forms were categorized as initiated by military or Partnership providers (the independent variable). Forms on which no provider was named were rejected from the sample. These categories were then subdivided into those that had contradictory work center identification data elements and those that did not (an example of such a case would be one in which the requesting provider's name did not match the MEPRS code). Presence of contradictory identification data elements was the variable of interest. The null hypothesis was that requests from Partnership providers were no more likely than requests from military providers to contain contradictory work center identification data elements. The alternate hypothesis was that requests from Partnership physicians were significantly more likely to contain

contradictory work center identification data elements. The probability level was set at .05. A chi square test was completed. The data array is in Table 3.

Table 3

Work Center Data Elements on Ancillary Service Requests

| | Military Provider Requests | Partner Provider Requests | Total Requests |
|---|---|---|---|
| Contradictory Data Elements | 39 | 11 | 50 |
| Non-Contradictory Data Elements | 51 | 12 | 63 |
| Total | 90 (x =.43) | 23 (x =.48) | 113 (x=.44) |

The computed chi square was found to be .149. The results were not significant, with a p value of 77.929 (Daniels, 1983). The null hypothesis could not be rejected. It appeared equally likely that military and Partner requests contain conflicting data elements. The best estimate was about 45% of requests from both groups contained conflicting identification data elements (Murdock, 1992).

These findings tended to confirm that the system was relying on flawed provider identification data on service requests, calling into question the data on which subsequent cost analyses rely. The concern was that flawed statistics could be used to justify selection of a particular provider-line option at the expense of delivery alternatives.

Average Cost Differential by Provider Line

Analyses of provider line costs for ambulatory obstetrics-gynecology based on MEPRS summary reports for fiscal year 1991 revealed a wide delta in average cost per visit between Partnership and military providers. The wide disparity in major ancillary services expense categories was a major factor in this disparity. According to MEPRS cost data, ambulatory non-Partner (military) gynecological ancillary service costs were almost eight times greater than those of Partnership providers. Partnership obstetricians were credited with zero ancillary service costs in all categories with the exception of Pharmacy, and Pharmacy costs charged to military obstetricians were over four times greater than Partnership Pharmacy costs. Even with productivity reported at approximately one-third that of military obstetricians-gynecologists, these low ancillary service costs resulted in unit costs for the Partnership Program to be far lower than military provider unit costs. Tables 4 and 5 show these cost analyses.

Table 4

MEPRS Ambulatory Gynecology Cost Analysis

Fiscal Year 1991

| | Military Gyn Cost | PartnerGynCost |
|---|---|---|
| Pharmacy | $ 270,104 | $ 54,017 |
| Pathology | 48,115 | 28 |
| Anatomical Pathology | 115,444 | 13,814 |
| Blood Trans | 0 | 0 |
| Radiology | 89,298 | 128 |
| KG | 28 | 0 |
| EEG | 0 | 0 |
| EMG | 0 | 0 |
| Pulmonary Functions | 0 | 0 |
| CSS | 13,907 | 0 |
| CMS | 0 | 0 |
| Anest | 0 | 0 |
| hOR | 0 | 0 |
| RR | 0 | 0 |
| SDSC | 0 | 0 |
| Inhal Therapy | 0 | 0 |
| OT | 0 | 0 |
| Phys Med | 0 | 0 |
| PT | 0 | 0 |
| Nuclear Medicine | 0 | 0 |
| Total Ancillary Cost (from all services) | $ 536,896 | $ 67,987 |
| Support | 103,286 | 21,030 |
| | $ 640,182 | $ 89,017 |
| Purification (overhead) | $ 212,214 | $ 54,020 |
| | | 189,459 |
| | $ 852,396 | $ 143,037 |
| Direct Expense | 234,193 | 11,014 |
| Total Support Cost | $ 1,086,589 | $ 154,051 |
| Less Military Pay | $ 198,199 | |
| Total Expenses divided by | $ 888,390 | $ 154,051 |
| Total Visits to derive | 17,281 | 4,399 |
| Cost per Visit | $ 51.41 | $ 35.02 |

(U.S Army Medical Activity, Fort Hood, TX, 1992).

Table 5

MEPRS Ambulatory Obstetrics Cost Analysis

Fiscal Year 1991

| | Military Ob Cost | PartnerOBCost |
|---|---|---|
| Pharmacy | $ 146,603 | $ 34,474 |
| Pathology | 420,741 | 0 |
| Anatomical Pathology | 8,553 | 0 |
| Blood Trans | 174,567 | 0 |
| Radiology | 252,664 | 0** |
| E KG | 110 | 0 |
| EEG | 0 | 47 |
| EMG | 0 | 0 |
| Pulmonary Functions | 364 | 0 |
| CSS | 6,245 | 0 |
| CMS | 0 | 0 |
| Anest | 0 | 0 |
| OR | 0 | 0 |
| RR | 0 | 0 |
| SDSC | 0 | 0 |
| Inhhal Therapy | 0 | 0 |
| OT | 0 | 0 |
| Phys Med | 0 | 0 |
| PT | 0 | 0 |
| Nuclear Medicine | 0 | 0 |
| Total Ancillary Cost | $ 1,009,847 | $ 34,521 |
| (from all services) | 113,650 | 34,062 |
| Support | $ 1,123,497 | $ 68,583 |
| Purification (overhead) | $ 330,902 | $110,866 |
| | $ 1,454,399 | 438,605 |
| | | $179,449 |
| Direct Expense | $ 217,696 | 2,360 |
| Total Support Cost | $ 1,672,095 | $181,809 |
| Less Military Pay | $ 217,996 | |
| Total Expenses | $ 1,454,099 | $ 181,809 |
| divided by Total Visits | 26,446 | 9,528 |
| to derive Cost per Visit | $ 54.98 | $ 19.08 |

(U.S Army Medical Activity, Fort Hood, TX, 1992).

These reports showed that the average cost of a gynecological visit to a military provider exceeded the average cost of a visit to a Partnership provider by 47%, and that the average cost of an obstetrics visit to a military provider was 188% greater than such a visit to a Partnership provider.

Justification for Partnership Agreement Initiation/Renewal

Perhaps due to doubts associated with the completeness and accuracy of MEPRS data, local cost analyses to justify Partnership provider agreements reflected average departmental (summary account, or second level) costs, not provider-line (fourth level) costs. Summary level statistics obscured the wide disparity in average costs by provider line, giving $47 as the average cost of a gynecology visit, and $53.93 as the average cost of an obstetrics visit (MEPRS, 1991). This made a very different impression about relative Partnership Program cost than would provider-line cost analyses.

If credible performance data were available to support provider-line cost analysis, local decisions regarding health care delivery options, such as the Partnership Program, could be improved. Better understanding of the cost impact of health care delivery options would be in keeping with Partnership Program and Coordinated Care Program implementation guidance. Provider-line cost analysis would be

particularly meaningful given the increasing contribution which Partnership physicians are making to facility productivity: Visits to Partnership physicians presently make up an average of 20% of monthly clinic visits at DACH, up from an average of 13% last fiscal year (Leonard, 1992).

Moreover, as the contest over whether DoD will endorse the CHAMPUS Reform Initiative or the Coordinated Care Program has shown, local cost data (compiled at DoD) could have a tremendous impact on health care policy. Given the sizeable economic stakes in this contest, medical treatment facilities bear a great responsibility to ensure that the data cited be credible, which is to say, accurate.

## Statement of the Management Problem

In justifications prepared to support Partnership Provider agreements, use of summary account expense data, rather than provider-line (fourth level MEPRS code) data, appeared to rest on the assumption that the distribution of weighted procedures in MEPRS summary account reports was skewed toward military provider accounts; Partnership Provider accounts were assumed to be overlooked. Overreporting of military provider support, and underreporting of Partnership provider support, would explain the cost differential. While this appeared to be the case, the extent to which this assumption held was not known. A concomitant assumption held

that total and average costs calculated at the department (summary account) level accurately represented the incremental MTF cost at the Partnership provider-line level.

The management problem was, did the distribution of weighted performance procedures in MEPRS reflect the actual distribution of these procedures by provider line (fourth-level MEPRS code)? Did total and average cost analyses based on this data reflect the actual distribution of ancillary service expenses by provider line?

## Review of the Literature

The unreliabiliy of routinely-collected hospital data has been noted in previous studies (Institute of Medicine, 1976). Moreover, while routine databases are considered of potential value in quality assessment (Bunker, Roos, Fowles, & Roos, 1986), some authors caution against using them in applications for which they were never intended (Eisenberg, 1986). That care must be exercised in data application is in keeping with Naisbitt's observation in Megatrends (1982), that it is not the supply of data, but the selection of appropriate data, which is at issue.

This observation touches on the issue of the databases available for health care research. Several studies have used medical claims data to make inferences about physician utilization patterns (Eisenberg, 1986). That this approach is

problematic is pointed out by Eisenberg (1986), who underscores the need for methodological research to underpin such utilization studies.

Other studies point to the fundamental problem of claims data inaccuracy with regard to diagnostic information. One found that DRG's on claims forms match the DRG on the medical record only about half the time (Johnson & Appel, 1984). While the accuracy of provider-line data on ancillary service requests may be an issue of less consequence than the accuracy of diagnostic information on claims forms, common to both is the potential impact on health care financing policy.

A study on data reliability concludes that three general levels of data reliability can be demonstrated. Data on hospital episodes were found to be the most accurate. Data on procedures were found to have a second level of reliability, but to vary greatly from hospital to hospital. Diagnostic coding data were found to be the least accurate (Bunker et al., 1986). These researchers concluded that the two-digit level of the standard four-digit code yielded the most consistent information, an observation of potential value in examining work center identification data which is similarly codified.

## Purpose of the Study

The purpose of this study was to verify or fail to

verify the distribution of MEPRS summary account ancillary service performance data, and cost analyses based on these data, for ambulatory clinics in a department with multi-provider lines. This was based on comparison of MEPRS ancillary service performance data to a tabulation of major ancillary service performance data, based on an audit of service requests from department providers; specimen logs; and pharmacy databases. One reporting period was audited. The variable of interest was the weighted percentage of ancillary service procedures charged to Partnership providers in a multi-line department. The null hypothesis was that the weighted percentage of summary account ancillary service procedures charged to Partnership providers (based on audit) is less than or equal to the percentage reported in MEPRS summary reports. The alternate hypothesis was that the weighted percentage of ancillary service procedures charged to Partnership providers (based on audit) is greater than the MEPRS summary account weighted percentage. These hypotheses were tested for major performance procedures in each major ancillary service category.

The second purpose of this study was to calculate the average cost of a visit to a Partnership provider, based on a stepdown of summary account ancillary service expenses (with distribution based on an audit of procedures charged to

Partnership providers). The delta between the average cost derived from MEPRS data and the average cost derived from the service request audit was reported.

Objectives

The first objective was to define the set of MEPRS standard account codes used to report ancillary service procedures in a multi-provider-line department during a specified reporting period, and to group these by provider line. The second objective was to define and classify by provider line the set of providers conducting ambulatory clinics during the period. The third objective was to define the set of ancillary service performance procedures charged to summary account ambulatory clinics during this period. The fourth objective was to group these procedures to facilitate comparison to tabulated procedures from service requests forms; modifications were made to retain the comparability of distribution patterns and allow calculation of total cost and average cost per visit. The fifth objective was to audit ancillary service requests, tabulating weighted procedures identified for comparison by MEPRS account. The sixth objective was to report the distribution of weighted procedures for major ancillary services by provider line (grouped MEPRS accounts). The seventh objective was to compare this distribution to MEPRS summary account performance

data distribution. The eighth objective was to apply MEPRS summary account cost analyses to the tabulated performance data distribution, obtaining a total cost per provider category. The ninth objective was to divide total provider-line cost by total visits to obtain an average ambulatory visit ancillary service cost. The final objective is to compare this average cost to the quotient obtained using MEPRS data.

## Methods and Procedures

### MEPRS Standard Account Codes

#### Ambulatory Obstetrics-Gynecology Work Centers (Subaccounts)

In the Department of Obstetrics-Gynecology, six work centers were differentiated through MEPRS standard account codes, viz., ambulatory obstetrics ("BCCA"); ambulatory gynecology ("BCBA"); Women's Health Clinic obstetrics, provided by midwives and clinical nurse practitioners ("BCCW"); Women's Health Clinic gynecology, also provided by midwives and clinical nurse practitioners ("BCBW"); Partnership obstetrics (provided by physicians in the department ambulatory clinic and midwives in Women's Health Clinic, coded "BCBP"); and Partnership gynecology (coded "BCBC," also provided in the ambulatory department clinic and Women's Health Clinic). These defined the set of codes by which tabulated and MEPRS weighted ancillary service procedure

distributions were compared.

Provider-line (Fourth Level) Groups

For purposes of provider-line comparison, the six MEPRS codes were grouped in three groups of two, based on the fourth position. This was necessary and practical for purposes of the study: First, service request forms were unreliable sources of MEPRS codes (procedures were classified by a decision rule described below). Second, appointment templates showed that all providers saw both obstetrics and gynecolgy patients, so there was no basis to eliminate any workcenter classification. (The status of the patient - obstetric or gynecolgic - ostensibly revealed by the MEPRS code, could not be verified without reference to medical records. However, as the purpose was not utilization review, but rather to categorize and cost weighted ancillary service procedures by provider line, the distinction between obstetric and gynecologic care was not material. For purposes of this study, the third level of the standard account code functioned as a place holder; the critical element was the fourth level of the code.)

MEPRS standard account codes classified requesting providers as follows: (a) military physicians, residents and interns, and screening nurse, BCBA and BCCA; (b) military nurse midwives and clinical nurse specialists in the Women's

Health Clinic, BCBW and BCCW; and (c) Partnership providers, both physicians and midwives, regardless of clinic location, BCBP and BCCP.

## Data Sources

### MEPRS Requesting Work Center Summaries

Performance procedures chargeable to MEPRS accounts were identified by raw count and weighted value under ancillary service areas in MEPRS monthly workcenter summaries. These areas were Clinical Pathology; Blood Bank; Anatomical Pathology; Diagnostic Radiology; and Pharmacy. The summary account value of all procedures in these areas was assessed (except as described below under Disposition of excluded values).

### Ancillary Service Requests and Registers

In discussion with Pathology and Diagnostic Radiology personnel, sources for collection, tabulation, and comparison of service requests to summary listings were identified. These were: (a) file copies of Clinical Pathology service requests and Blood Bank requests maintained by Department of Pathology; (b) the specimen log, Anatomical Pathology Branch, Department of Pathology; (c) information system (TRIPHARM) reports, Pharmacy Service; and (d) the ultrasound register, Ultrasound Branch, Department of Radiology.

### Departmental Providers Listing and Appointment Templates

Providers were identified through listings of privileged providers from the Credentials Officer, Darnall Army Community Hospital. These were compared to patient appointment templates to screen out providers who did not conduct ambulatory clinics during the period. During the reporting period, the number of Department of Obstetrics-Gynecology providers seeing ambulatory patients for which ancillary services could be requested totaled twenty-nine. Of these, nine were military physicians; eight were Partnership physicians and midwives; six were military nurse midwives or clinical nurse specialists; five were residents and interns; and one was a screening nurse.

## Assumptions

### Accuracy of Functional and Summary Reporting

To allow for provider-line comparison within the summary account, an assumption that MEPRS ancillary service summaries accurately reported the number and categories of procedures at the functional (first) and summary (second) level was made; thus no test of the accuracy of functional and summary level reporting was required.

### Accounting for Deltas between Tabulation and MEPRS Data

A second assumption was made to cover discrepancies between MEPRS reports and tabuled summary account procedures:

Deltas between tabulated count and MEPRS workcenter summaries represented data loss, errors in tabulation, or resulted from crude estimating procedures (used where direct count was not feasible, as described under respective ancillary service sections below). Such deltas, perhaps unavoidable, did not negate findings on the distribution of weighted summary account procedures, which were the focus of the study.

## Decision Rules

### Tabulation Decision Rule

Review of data sources revealed that in many cases these sources provided incomplete, contradictory workcenter data, making a decision rule necessary to specify the chargeable MEPRS account. Procedures were charged to MEPRS accounts based on the following data elements, in order: (a) requesting provider; (b) MEPRS account; and (c) clinic. Absent a requesting provider, procedures were charged to the MEPRS account identified on the request. Absent a requesting provider and MEPRS account, procedures were charged to the clinic identified (distinguishing between gynecologic and obstetric - third position - work centers was not material to provider-line classification).

### Procedure Comparison Decision Rules

The difficulty of comparing requests for services to MEPRS procedure classifications was a major issue in study

design. To make feasible the comparison of MEPRS procedure classifications to service requests and specimen logs, decision rules were required. In general, rules were applicable if more than one procedure applied to a single service request or if procedures were transparent based on the processed request. In other cases (see Tabulation of microbiology procedures) procedure weighted value was assigned based on weighted frequencies for a family of procedures.

Disposition of Values Excluded from Analysis

Based on difficulties involved in comparing some MEPRS procedures to service requests, certain procedure values were excluded from tabulation. Because the balance of excluded values would have an impact on costs, disposition of the balance was necessary. Table 6 shows service area summary values for included procedures (74% of ancillary service weight) and the balance of excluded procedures (26% of ancillary service weight).

Table 6

Summary Account Values Classified for Tabulation

| MEPRS Area | Weighted Value | Value of Audited Procedures | Pct Total Value | Balance | Pct Total Value |
|---|---|---|---|---|---|
| Clin Path | 71765.3 | 45711.5 | 64% | 26053.8 | 36% |
| Blood Bank | 25413.0 | 23947.0 | 94% | 1466.0 | 6% |
| Anat Path | 9102.0 | 8595.0 | 94% | 507.0 | 6% |
| Diag Rad | 5737.3 | 5007.7 | 87% | 729.6 | 13% |
| Pharmacy | 3497.0 | 3497.0 | 100% | 0.0 | -- |
| Total | 115514.6 | 85532.5 | 74% | 29980.4 | 26% |

Clinical Pathology balance. Clinical Pathology included eleven MEPRS locations, six of which were compared to summary account provider requests: Chemistry; Hematology; Urine and Feces; Microbiology; and Immunology. Excluded were five locations: Specimen Processing and Dispatch; and four Stat locations (identifying separate shifts). Table 7 classifies summary procedure values as tabulated or excluded.

Table 7

Classification of Clinical Pathology Values

| MEPRS Location | Weighted Value | Value & Pct for Audit | | Value & Pct of Balance | | ClinPath Value | Clin Path PctAud | Clin Path PctBal |
|---|---|---|---|---|---|---|---|---|
| Chemistry | 2141.1 | 1403.3 | (65%) | 737.8 | (35%) | 71765.3 | 2% | 1% |
| Hematology | 5899.0 | 4856.0 | (82%) | 1043.0 | (18%) | 71765.3 | 7% | 1% |
| Urin&Feces | 12910.0 | 12541.0 | (97%) | 369.0 | ( 3%) | 71765.3 | 18% | <1% |
| Micribio | 13745.7 | 12690.2 | (92%) | 1055.5 | ( 8%) | 71765.3 | 18% | 1% |
| Immuno | 14331.0 | 14221.0 | (99%) | 110.0 | ( 1%) | 71765.3 | 20% | <1% |
| Stat 1 | 2855.1 | 0.0 | ( 0) | 2855.1 | (100%) | 71765.3 | 0 | 4% |
| Stat 2 | 3434.4 | 0.0 | ( 0) | 3434.4 | (100%) | 71765.3 | 0 | 5% |
| Stat 3 | 0.0 | -- | | -- | | 71765.3 | -- | -- |
| Stat 4 | 0.0 | -- | | -- | | 71765.3 | -- | -- |
| SpecProc | 16449.0 | 0.0 | ( 0) | 16449.0 | (100%) | 71765.3 | 0 | 23% |
| Total | 71765.3 | 45711.5 | (65%) | 26053.8 | (36%) | 71765.3 | 65% | 36% |

Specimen Processing and Dispatch included venipuncture and other procedures which were transparent on service requests. Stat procedures were difficult to capture as a group. However, together these locations represented 32% of Clinical Pathology summary account value. It was decided not to attempt tabulation of these procedure categories, but to include their weighted value in the analysis, distributing the balance as reported by MEPRS. This was a conservative decision: In that MEPRS charged none of these procedures to Partnership provider accounts, it would tend to support the null hypothesis, i.e., that Partnership provider weighted procedures were less than or equal to percentages in MEPRS summary reports.

The balance of procedures in Chemistry, Hematology, Urinalysis, Microbiology, and Immunology represented 4% of Clinical Pathology value. Exclusion of this percentage would have a relatively small impact on summary value and total costs. Therefore, total summary account Clinical Pathology value was reduced by this percentage.

Blood Bank balance. The balance of summary account Blood Bank procedures constituted 6% of Blood Bank value and 1% of ancillary service value. As the impact on total costs was relatively small, total Blood Bank value was reduced by the balance of 6%.

Anatomical Pathology balance. The balance of summary

account Anatomical Pathology procedures constituted 6% of the area value, and less than one-half of 1% of summary account ancillary service value. The value of this area was reduced by 6% in cost analysis.

Diagnostic Radiology balance. The balance of summary account Diagnostic Radiology procedures constituted 13% of ancillary service area value and six-tenths of 1% of summary account ancillary service value. Given its relatively large share of Diagnostic Radiology value, it was decided to distribute the 13% balance of summary account Diagnostic Radiology value as reported by MEPRS. This was the most conservative decision possible: Virtually none of these procedures were reported by MEPRS against Partnership provider lines, so this decision would tend to support the null hypothesis, i.e., that Partnership provider weighted procedures were less than or equal to percentages in MEPR summary reports.

## Validity and Reliability

To insure validity, a definitive list of privileged providers in the Department of Obstetrics-Gynecology, obtained from the Credentials Officer, Darnall Army Community Hospital, was used to screen out non-departmental providers. In addition, patient appointment templates from ambulatory obstetrics-gynecology clinics for the period under study were used to screen the privileged provider listing. Finally, a set of ancillary

service performance measures associated with the ambulatory obstetrics-gunecology clinics for the period of study was defined, based on all departmental procedures in the MEPRS database for that period.

Reliability was insured by completing a 100% count of ancillary services procedures requested by departmental providers for the period under investigation.

## Tabulation by Ancillary Service Area

### Clinical Pathology

Following analysis of MEPRS summary account procedure listings and consultation with Pathology administration, procedures in each section were grouped for tabulation on the basis of services requested. Groups of weighted procedures are described under each MEPRS location below.

Tabulation of chemistry procedures. Chemistry Group 1 comprised procedures 1035 and 1162, which together accounted for 65% of MEPRS summary account chemistry weighted value, as shown in Table 8.

Table 8

Summary Account Chemistry Group 1 Procedures

| MEPRS Code | ID Number | Name | Raw Count | Weighted Value | % Chem Weight |
|---|---|---|---|---|---|
| 1035 | 82410.096 | Automated Chem Set-Up | 636 | 1335.6 | 62% |
| 1162 | 84330.096 | Glucose, Quant/Astra 8 | 677 | 67.7 | 3% |
| Total Count, Wtd Value & % Summary Wt | | | 1313 | 1403.3 | 65% |

The combined weight of these procedures (2.1 + .1 = 2.2) applied to all but 41 (677 - 636 = 41) of summary account requests for glucose testing. Since it was not apparent, based on service requests, which requests should not receive the additional weight, it was decided to distribute a proportionate share of the balance between all requests tabulated (41 x 2.2 = 86.1; divide 86.1 by results of tabulation).

The balance of procedures comprised a group which did not lend itself to tabulation on the basis of processed service request forms. Although procedures in Group 2 represented 35% percent of summary account weighted chemistry procedures, each adds little to summary account value due to low count. Low count also made it difficult to insure capture. The exception to low count was procedure 1072 (Calculation), at fourteen percent; however, this was a manual procedure which complemented automated analysis, and it is was easily overlooked on the service request. Because procedures 1031 and 1033 reflected the means of analysis, not the test requested, these procedures could not be inferred from service requests alone. While infrequent, procedures 1140 and 5174 were transparent on the service requests.

The balance of Chemistry Group 2 procedures were excluded from tabulation and cost analysis, as discussed above. Table 9 displays Chemistry Group 2.

Table 9

Summary Account Chemistry Group 2 Procedures

| MEPRS Code | ID Number | Name | Raw Count | Weighted Value | % Chem Weight |
|---|---|---|---|---|---|
| 1031 | 82410.035 | Auto Chem Set-Up/Du ACA | 12 | 30.0 | 1% |
| 1033 | 82410.049 | AutoChemSet-Up/AbottTDX | 1 | 1.2 | <1% |
| 1153 | 81307.049 | Gentamycin/TDX | 1 | .5 | <1% |
| 1140 | 82804.000 | Entry Demographic Data | 39 | 35.1 | 2% |
| 1006 | 82040.035 | Albumin/Dupont ACA | 12 | 6.0 | <1% |
| 1072 | 82350.000 | Calculation | 97 | 291.0 | 14% |
| 1088 | 82400.056 | ChemAnalProfile/SMA 8/60 | 32 | 192.0 | 9% |
| 1157 | 82955.000 | Glucose-6-Phos Dehydrog | 3 | 30.0 | 1% |
| 1164 | 85051.000 | Glycohemoglobin, Column | 1 | 10.0 | <1% |
| 1232 | 82805.000 | Ph, Body Fluids | 1 | 7.0 | <1% |
| 1280 | 84180.000 | Protein,Quant,Urin,Fluid | 15 | 90.0 | 4% |
| 1238 | 84917.000 | Phenobarb/Serm/Quant/Emit | 6 | 18.0 | 1% |
| 1366 | 84821.092 | Lithium/Serum/Quant/I1643 | 1 | 7.0 | <1% |
| 5174 | 89362.000 | Specimen Preprocessing | 4 | 20.0 | 1% |
| Total Count, Wtd Value & % Summary Wt | | | 225 | 737.8 | 35% |

Tabulation of hematology procedures. Eighty-two percent of summary account hematology weighted values were concentrated in procedures 2014, 2075, and 2067. These procedures were not applicable to the same set of service requests, so a combined value was not applied. Respective values for this group were 4 (procedures 2014 and 2067) and 14 (procedure 2075). Hematology Group 1 is displayed in Table 10.

Table 10

Summary Account Hematology Group 1 Procedures

| MEPRS Code | ID Number | Name | Raw Count | Weighted Value | % Hemat Weight |
|---|---|---|---|---|---|
| 2014 | 85017.087 | Blood Cell Prof/s PII | 715 | 2860.0 | 48% |
| 2075 | 85660.000 | Sickle Cell ID | 126 | 1764.0 | 30% |
| 2067 | 85613.084 | PT/PTT | 58 | 232.0 | 4% |
| Total Count, Wtd Value & % Summary Wt | | | 899 | 4856.0 | 82% |

The balance of procedures did not, as a group, lend themselves easily to tabulation on the basis of processed service request forms. Although this group represented 18% of summary account weighted hematology procedures, each procedure was low in weighted value. Low frequency made it easy to overlook them. Procedures 2021, 1072 and 2016 were manual procedures which complemented automated analysis; they were transparent on service request forms. Disposition of the value of these procedures is described above. Table 11 displays Hematology Group 2.

Table 11

Summary Account Hematology Group 2 Procedures

| Code | ID Number | Name | Raw Count | Weighted Value | % Hemat Weight |
|---|---|---|---|---|---|
| 2021 | 85581.000 | Blood Film Screen | 1 | 5.0 | <2% |
| 1072 | 82350.000 | Calculation | 33 | 99.0 | <2% |
| 1169 | 83020.000 | Hemoglobin Electrophor | 9 | 225.0 | <4% |
| 1170 | 83030.000 | Hemoglibin, Fetal Chem | 7 | 217.0 | <4% |
| 2016 | 85008.000 | Blood Film Exam | 15 | 165.0 | <3% |
| 2045 | 85370.000 | Fibrinogen,ScreeningTest | 9 | 54.0 | <1% |
| 2044 | 85371.000 | FibrinDegradProd/KitMeth | 4 | 32.0 | <1% |
| 2058 | 85570.000 | PlateletCount,WholeBlood | 1 | 9.0 | <1% |
| 2073 | 85645.000 | Reticulocyte Count | 16 | 144.0 | 2% |
| 2074 | 85655.000 | Sedimentation Rate | 2 | 8.0 | <1% |
| Total Count, Wtd Value & % Summary Wt | | | 196 | 958.0 | 18% |

Tabulation of urinalysis procedures. Urinalysis Group 1 comprised procedures 8024, 9019, 9020, and 4088; these accounted for 98% of summary account urinalysis weighted procedures. Procedure 8024 (urine collection) accompanied every procedures in Urinalysis Group 1, so its weight of six was added to the weight of every other procedure in this group. Procedure 9019 was given a weight of 12 (6 + 6); procedure 9020 receiveds a weight of 10 (4 + 6); and procedure 4088 was given a weight of 11 (5 + 6). Urinalysis Group 1 is presented in Table 12.

Table 12

Summary Account Urinalysis Group 1 Procedures

| MEPRS Code | ID Number | Name | Raw Count | Weighted Value | % Urin Weight |
|---|---|---|---|---|---|
| 8024 | 89340.001 | Urine, Collection | 1152 | 6912.0 | 54% |
| 9019 | 81000.000 | U/A, Routine w/Micro | 249 | 1494.0 | 12% |
| 9020 | 81002.000 | U/A Routine w/o Micro | 380 | 1520.0 | 12% |
| 4088 | 86006.018 | HCG/Qual | 523 | 2615.0 | 20% |
| Total Count, Wtd Value & % Summary Wt | | | 2304 | 12541.0 | 98% |

Table 13 shows the one remaining procedure, 9017, which comprised 2% of summary account urinalysis weighted values. This procedure was excluded from tabulation and cost analysis.

Table 13

Summary Account Urinalysis Group 2 Procedures

| MEPRS Code | ID | Name | Raw Count | Weighted Value | % Summary Weight |
|---|---|---|---|---|---|
| 9017 | 81104.000 | U/A Single Component | 123 | 369.0 | 2% |
| Total Count, Wtd Value & % Summary Wt | | | 123 | 369.0 | 2% |

Tabulation of microbiology procedures. In this area, bacterial culturing procedures were tabulated. These were divided into three groups. Microbiology Group 1 comprised 42% of summary expense account microbiology weighted values and consisted of two procedures, displayed in Table 14.

Table 14

Summary Account Microbiology Group 1 Procedures

- Direct Count Procedures -

| MEPRS Code | ID Number | Name | Raw Count | Weighted Value | % Micro Weight |
|---|---|---|---|---|---|
| 5215 | 87530.000 | Accession Specimen | 1566 | 2662.2 | 19% |
| 5270 | 87550.000 | Record/Report Bac Cult | 1566 | 3132.0 | 23% |
| Total Count, Wtd Value & % Summary Wt | | | 3132 | 5794.0 | 42% |

A second group of four, mutually-exclusive procedures was identified, which applied to all bacterial culturing and accounted for 32% of summary expense account weighted values. Because number of readings/organisms would require case-by-case reference to Pathology personnel, it was decided to weight all procedures in this group at two, based on weighted frequencies. Microbiology Group 2 procedures are in Table 15.

Table 15

Summary Account Microbiology Group 2 Procedures

- Procedures Counted at Weight of 2 -

| MEPRS Code | ID Number | Name | Raw Count | Weighted Value | % Micro Weight |
|---|---|---|---|---|---|
| 5260 | 87542.000 | Read Cult, 1 Org | 1389 | 2778.0 | 20% |
| 5262 | 87544.000 | Read Cult, 2 Org | 262 | 786.0 | 6% |
| 5264 | 87546.000 | Read Cult, 2 X | 303 | 303.0 | 2% |
| 5266 | 87548.000 | Read Cult, + 2 Org | 258 | 516.0 | 4% |
| Total Count, Wtd Value & % Summary Wt | | | 2212 | 4383.0 | 32% |

A third group of four, mutually-exclusive procedure categories, which applied to all bacterial culturing procedures

and accounted for 18% of summary expense account weighted values, was identified as Microbiology Group 3. Because number of plate media were not identified on service requests, it was decided to weight all Group 3 procedures at three, based on weighted values for this procedure group. Microbiology Group 3 is displayed in Table 16.

Table 16

Summary Account Microbiology Group 3 Procedures

- Procedures Counted at Weight of 3 -

| MEPRS Code | ID Number | Name | Raw Count | Weighted Value | % Micro Weight |
|---|---|---|---|---|---|
| 5242 | 87532.000 | Plant 2 Media | 688 | 1376.0 | 10% |
| 5244 | 87533.000 | Plant 3 Media | 34 | 94.8 | <1% |
| 5246 | 87534.000 | Plant 4 Media | 1 | 3.6 | <1% |
| 5248 | 87535.000 | Plant 5 Media | 236 | 1038.4 | 8% |
| Total Count, Wtd Value & % Summary Wt | | | 959 | 2512.0 | 18% |

Together, these three groups accounted for 92% of summary account microbiology weighted values. Based on additive weighted values, each tabulated procedure received a weight of 8.7.

The balance of microbiology procedures were grouped based on low count and consequent low weighted value, as shown in Table 17. These procedures were excluded from tabulation and cost analysis.

Table 17

Summary Account Microbiology Group 4 Procedures

| MEPRS Code | ID Number | Name | Raw Count | Weighted Value | % Micro Weight |
|---|---|---|---|---|---|
| 1293 | 89320.000 | Semen Analysis | 28 | 420.0 | 3% |
| 5013 | 87706.000 | Biochem Test, Rapid | 72 | 72.0 | <1% |
| 5032 | 87720.000 | Gram Stain From Cult | 72 | 180.0 | 1% |
| 5082 | 87736.000 | Subculture | 180 | 270.0 | <2% |
| 5028 | 87920.071 | Formalin Ether | 2 | 8.0 | <1% |
| 5036 | 87925.075 | Macro Exam, Feces | 2 | 6.0 | <1% |
| 5043 | 87925.076 | Micro Exam, Feces | 8 | 56.0 | <1% |
| 5085 | 87930.068 | Trichrome Stain | 1 | 8.0 | <1% |
| 5232 | 87900.000 | Accession Parasit | 2 | 3.4 | <1% |
| 5280 | 87910.000 | Record/Report Parasit | 2 | 4.0 | <1% |
| 5031 | 87718.000 | Gram Stain from Spec | 1 | 5.1 | <1% |
| 5080 | 87734.000 | Streptex Typing | 3 | 12.0 | <1% |
| 5078 | 87942.000 | Streptex Extraction | 3 | 6.0 | <1% |
| 5174 | 89362.000 | Specimen Preprocessing | 1 | 5.0 | <1% |
| Total Count, Wtd Value & % Summary Wt | | | 377 | 1055.5 | 8% |

Tabulation of immunology procedures. Ninety-eight percent of immunology weighted values in the MEPRS summary expense account were concentrated in four procedures, comprising Immunology Group 1, shown in Table 18.

Table 18

Summary Account Immunology Group 1 Procedures

| MEPRS Code | ID Number | Name | Raw Count | Weighted Value | % Immuno Weight |
|---|---|---|---|---|---|
| 4075 | 82803.055 | ELISA (NOS) | 746 | 5222.0 | 43% |
| 4203 | 86430.000 | Syphilis/RPR/Qual | 499 | 1497.0 | 12% |
| 5174 | 89362.000 | Specimen Preprocessing | 848 | 4240.0 | 31% |
| 4008 | 86006.000 | Antibody Det Agg/Qul | 438 | 2190.0 | 12% |
| Total Count, Wtd Value & % Summary Wt | | | 2531 | 13149.0 | 98% |

The remaining summary account immunology procedures

comprised 2% of summary account immunology weighted values, and were excluded as described above. Table 19 displays these procedures.

Table 19

Summary Account Immunology Group 2 Procedures

| MEPRS Code | ID | Name | Raw Count | Weighted Value | % Immuno Weight |
|---|---|---|---|---|---|
| 4073 | 86030.051 | DNA Antibds/IDTFixFmtr | 3 | 24.0 | <1% |
| 4174 | 86006.029 | Rheumatoid Factor/Qual | 2 | 10.0 | <1% |
| 4246 | 86280.000 | Hemaglut-Inhib/NOS/GP 4 | 2 | 40.0 | <1% |
| 4205 | 86410.000 | Syphilis/VDRL/Qual | 2 | 6.0 | <1% |
| 4206 | 86420.000 | Syphilis/VDRL/Quant | 10 | 30.0 | <1% |
| Total Count, Wtd Value & % Summary Wt | | | 19 | 110.0 | 2% |

Blood Bank

Tabulation of blood bank procedures. Following analysis of MEPRS summary account blood bank procedures and consultation with Pathology administration, a decision to tabulate by work center only the five procedures in which 94% of summary account blood bank weighted procedures were concentrated was made. These procedures, designated Blood Bank Group 1, applied to the same process requests, giving each request tabulated a value of 38 (based on procedure 0004 at 7; procedure 0015 at 10; procedure 0063 at 12; and procedure 5174 at 5). Table 20 shows this group.

Table 20

Summary Account Blood Bank Group 1 Procedures

| MEPRS Code | ID Number | Name | Raw Count | Weighted Value | % BB Weight |
|---|---|---|---|---|---|
| 0004 | 86082.000 | ABO Cell Srm RHO Typ | 631 | 4417.0 | 17% |
| 0015 | 86167.000 | Antibody Det W/Typ&Scr | 630 | 6300.0 | 25% |
| 0063 | 86216.000 | Reagent RBC Prep Enzy | 630 | 7560.0 | 30% |
| 2077 | 89362.000 | Spec Dispatch | 630 | 2520.0 | 10% |
| 5174 | 89362.000 | Spec Preprocessing | 630 | 3150.0 | 12% |
| Total Count, Wtd Value & % Summary Wt | | | 3151 | 23947.0 | 94% |

Table 21 shows the remaining procedures, which comprised about 6% of summary account blood bank weighted value. The weights of these were excluded (see above).

Table 21

Summary Account Blood Bank Group 2 Procedures

| MEPRS Code | ID | Name | Raw Count | Weighted Value | % BB Weight |
|---|---|---|---|---|---|
| 0024 | 86120.000 | Antigen BldType,S or T | 5 | 10.0 | <1% |
| 0018 | 86160.001 | Antigen Ident, Liss | 44 | 1408.0 | 6% |
| 0042 | 86847.000 | Inhibition/Neutralztn | 8 | 48.0 | <1% |
| Total Count, Wtd Value & % Summary Wt | | | 57 | 1466.0 | 6% |

Anatomical Pathology

This MEPRS subaccount contained two locations, cytology and histology. All ambulatory obstetrics-gynecology account procedure listings for this time period were in the latter.

Tabulation of histology procedures. Following analysis of summary account histology procedures and consultation with Pathology administration, a decision was made to group procedures

to facilitate tabulation. Table 22 displays Histology Group 1 procedures, which together comprised 94% of summary account histology value.

Table 22

Summary Account Histology Group 1 Procedures

| MEPRS Code | ID Number | Name | Raw Count | Weighted Value | % Histo Weight |
|---|---|---|---|---|---|
| 3067 | 88055.000 | Section, Add Slice | 501 | 2004.0 | 22% |
| 3017 | 88340.001 | Clerical, Surg | 282 | 3948.0 | 44% |
| 3059 | 88345.001 | Section, Surg | 303 | 1515.0 | 16% |
| 3037 | 88501.001 | Gross Surg | 282 | 1128.0 | 12% |
| Total Count, Wtd Value & % Summary Wt | | | 1368 | 8595.0 | 94% |

The problem was to find a way to assess specimen log weights. It was affirmed by Pathology staff that multiple procedures applied to each case; however, consultation on individual cases was impractical. Therefore, a calculated weight was derived as follows: First a base weight, representing the sum of all Group 1 procedures (4 + 14 + 5 + 4 = 27) was applied to the lowest raw count, or base count, of 282 (27 x 282 = 7614). This left 219 counts of procedure 3067 and 19 counts of procedure 3059 unassessed. Second, the value of the components of the unassessed balance was calculated (219 x 4 = 876; 19 x 5 = 95). Third, each unassessed component value was divided by the base count of 282 (876/282 = 3; 95/282 = .3) Finally, these quotients were added to the base value to obtain a derived value of 30.3 (27 + 3 + .3 = 30.3).

The second group, Histology Group 2, consisted of procedures which were difficult to identify based on evaluation of the service request alone, and which as a group added 5% to the value of histology procedures. These were eliminated from costing and tabulation, as described above. Table 23 displays Group 2 procedures.

Table 23

Summary Account Histology Group 2 Procedures

| MEPRS Code | Raw IDName | | Weighted Count | % Histo Value | Weight |
|---|---|---|---|---|---|
| 3087 | 88305.000 | Stains - Group 2 | 3 | 42.0 | <1% |
| 3013 | 88343.000 | Case Review | 93 | 465.0 | 5% |
| Total Count, Wtd Value & % Summary Wt | | | 96 | 507.0 | 5 |

Diagnostic Radiology

Tabulation of ultrasound procedures. Procedures were grouped to facilitate tabulation. Essentially, only ultrasound procedures were counted; these represented 87% of summary account diagnostic radiology procedures. Based on weighted count, a derived weight of 10.8 was used to tabulate procedure requests. Table 24 shows the grouped procedures.

Table 24

Summary Account Diagnostic Radiology Group 1 Procedures

| MEPRS Code | Name | Raw Count | Weighted Value | % DiagRad Weight |
|---|---|---|---|---|
| 4100 | US, Pelvis | 29 | 240.7 | 4% |
| 4102 | US, Pelvis (Read) | 2 | 7.8 | <1% |
| 4480 | US, Renals | 1 | 9.8 | <1% |
| 4520 | US, Abdomen | 120 | 66.6 | <1% |
| 4521 | US, Abdomen (Exam) | 1 | 12.0 | <1% |
| 4580 | US, Pelvis | 5 | 41.5 | <1% |
| 4582 | US, Pelvis (Read) | 1 | 3.9 | <1% |
| 4600 | US, OB | 252 | 2932.2 | 51% |
| 4620 | US, Gestational Age | 184 | 1656.0 | 29% |
| 4621 | US, Gestatnl Age (Exam) | 1 | 4.7 | <1% |
| 4601 | US, OB (Exam) | 5 | 30.5 | <1% |
| 4602 | US, OB (Read) | 2 | 11.0 | <1% |
| Total Count, Wtd Value & % Summary Wt | | 486 | 5007.7 | 87% |

The balance of diagnostic radiology procedures were not tabulated, but were included in cost analysis as described above. Procedures in this group are presented in Table 25.

Table 25

Summary Account Diagnostic Radiology Group 2 Procedures

| MEPRS Code | Name | Raw Count | Weighted Value | % DiagRad Weight |
|---|---|---|---|---|
| 0020 | Chest, PA/LAT | 1 | 3.00 | <1% |
| 0046 | Chest, Lordotic | 2 | 5.40 | <1% |
| 0230 | LT Thumb | 1 | 1.90 | <1% |
| 0900 | LT Knee (2) | 1 | 2.40 | <1% |
| 1056 | LT Hip | 1 | 2.80 | <1% |
| 1070 | RT Hip | 1 | 2.80 | <1% |
| 1136 | Pelvis, Other | 1 | 2.40 | <1% |
| 1150 | KUB | 3 | 7.50 | <1% |
| 1153 | Abdomen, Upright (only) | 1 | 2.50 | <1% |
| 1190 | Abdomen Series, Acute | 2 | 7.80 | <1% |
| 1530 | Sinus Series (3) | 1 | 3.70 | <1% |
| 2030 | L-S Spine Series (3) | 2 | 6.40 | <1% |
| 3050 | Barium Enema | 3 | 26.40 | <1% |
| 3180 | Hysterosalpingogram | 4 | 38.40 | <1% |
| 3600 | IVP | 6 | 45.60 | <1% |
| 3690 | Mammogram, Bilat | 44 | 268.40 | 5% |
| 5043 | CT, Sella w/Contrast | 2 | 51.80 | <1% |
| 5163 | CT, Coronals w/Contrast | 2 | 49.00 | <1% |
| 5503 | CT, Routine ABD w/Contrast | 1 | 29.10 | <1% |
| 5543 | CT, Liver w/Contrast | 1 | 29.10 | <1% |
| 5583 | CT, Kidney w/Contrast | 1 | 29.10 | <1% |
| 5603 | CT, Pelvis w/Contrast | 1 | 29.10 | <1% |
| 5800 | CT, Reconstruction | 2 | 68.00 | 1% |
| 5996 | CT, Other | 1 | 17.00 | <1% |
| 9004 | Emergency | 1 | 0.00 | |
| 9107 | Copy/Subtraction Film | 1 | 0.00 | |
| Total Count, Wtd Value & % Summary Wt | | 87 | 729.60 | 13% |

Pharmacy

Provider code. By the information system (TRIPHARM) in use at Darnall Army Community Hospital, each prescribing provider was assigned a code to identify that provider with a particular MEPRS account. Correct MEPRS subaccount assigment would insure that prescriptions were accurately identified with the appropriate

work center, if there were no change in the status of the provider. Limitations to this assignment policy - a provider may prescribe for patients in more than one subaccount (e.g., obstetrics and gynecology) - were immaterial for purposes of this study.

Provider-line tabulation. Provider-line tabulation of summary account pharmaceutical expenses was facilitated by the standard weight of one assigned to all prescription and refill performances. The four remaining pharmacy performance measures, viz., clinic issues; bulk issues; sterile products; and unit dose; had zero procedures in the ambulatory obstetrics-gynecology summary account. Given the assumption that total prescription and refill counts were accurate at the functional and summary level, it was necessary only to determine what percentage of prescriptions and refills were prescribed by Partnership providers, and what percentage by military providers (Women's Health Clinic or Obstetrics-Gynecology Clinic), to determine the distribution of ancillary performance by provider line.

## Results

Tabulation revealed that the Obstetrics-Gynecology Clinic was responsible for 66% of weighted ancillary performance procedures. Women's Health Clinic and Partnership providers, respectively, accounted for 14% and 20% of ancillary performance procedures.

Cost analyses based on tabulation showed ancillary services expenses to be more evenly distributed across provider lines in the tabulated data. It followed that total and average costs per visit were more closely matched across provider lines in cost analyses based on tabulated procedures. However, considerable differences in average and total costs were revealed.

## Clinical Pathology Weighted Procedures Tabulation

### Tabulated Chemistry Procedures Distribution

Table 26 displays the results of tabulation of weighted chemistry procedures.

Table 26

Chemistry Group 1 Procedures

Tabulated by Work Center

| MEPRS Code | Raw Count | Combined Weight | Weighted Value* | Pct Weighted Value |
|---|---|---|---|---|
| BCBA | -- | 2.2 | 0.0 | 0% |
| BCCA | 113 | 2.2 | 233.6 | 17% |
| BCBW | -- | 2.2 | 0.0 | 0% |
| BCCW | 186 | 2.2 | 386.0 | 28% |
| BCBP | -- | 2.2 | 0.0 | 0% |
| BCCP | 378 | 2.2 | 783.4 | 55% |
| Total | 677 | | 1403.0 | 100% |

Note. Values were reduced proportionately for the 41 outstanding procedures with weights of 2.1, as follows: 41 x 2.1 = 86.1; 17% of 86.1 = 15; 27% of 86.1 = 23; and 56% of 86.1 = 48.

Comparison of tabulation to MEPRS chemistry distributions.

Table 27 compares tabulated weighted chemistry procedures to reported chemistry weighted procedures. Note the high concentration within military provider accounts in the MEPRS summary. Tabulated findings distributed summary account procedures more widely across work centers, both Women's Health Clinic and Partnership providers.

Table 27

Chemistry Group 1 Procedures -

Comparison of Tabulation to MEPRS

| MEPRS Code | Tabulation Weighted Value | Tabulation Percent Summary Value | MEPRS Weighted Value | MEPRS Percent Summary Value |
|---|---|---|---|---|
| BCBA | 0.0 | 0% | 5.6 | 2% |
| BCCA | 233.6 | 17% | 1397.7 | 98% |
| BCBW | 0.0 | 0% | 0.0 | 0% |
| BCCW | 386.0 | 28% | 0.0 | 0% |
| BCBP | 0.0 | 0% | 0.0 | 0% |
| BCCP | 783.4 | 56% | 0.0 | 0% |
| Totals | 1403.0 | 100% | 1403.3 | 100% |

Tabulated Hematology Procedures Distribution

Table 28 displays the results of hematology tabulation.

Table 28

Hematology Group 1 Procedures

Tabulated by Work Center

| MEPRS Code | BCP/PII | Sickle Cell | PT/PTT | Total | Pct Total |
|---|---|---|---|---|---|
| BCBA | 136 | 14 | -- | 150 | 3% |
| BCCA | 1776 | 1694 | 224 | 3694 | 75% |
| BCBW | 12 | 14 | -- | 26 | 0% |
| BCCW | 348 | 70 | 4 | 422 | 9% |
| BCBP | 16 | 14 | -- | 30 | 0% |
| BCCP | 572 | 28 | -- | 600 | 12% |
| Total | 2860 | 1834 | 228 | 4922 | 100% |

Comparison of tabulation to MEPRS hematology distributions. Table 29 compares tabulation to MEPRS summary reported weighted values. Note the high concentration within MEPRS military provider accounts. Tabulated findings distributed summary expense account hematology performance factors more widely across work centers, including Women's Health Clinic and Partnership providers.

Table 29

Hematology Group 1 Procedures -

Comparison of Tabulation to MEPRS

| MEPRS Code | Tabulation Weighted Value | Tabulation Percent Summary Value | MEPRS Weighted Value | MEPRS Percent Summary Value |
|---|---|---|---|---|
| BCBA | 150.0 | 3% | 28.0 | <1% |
| BCCA | 3694.0 | 75% | 4828.0 | >99% |
| BCBW | 26.0 | <1% | 0.0 | 0% |
| BCCW | 422.0 | 9% | 0.0 | 0% |
| BCBP | 30.0 | <1% | 0.0 | 0% |
| BCCP | 600.0 | 12% | 0.0 | 0% |
| Totals | 4922.0 | 100% | 4856.0 | 100% |

Note. Delta between tabulated and MEPRS count was 66, or 1%. This did not materially impact distribution patterns by provider line.

Tabulated Urinalysis Procedures Distribution

Table 30 displays the tabulation of urinalysis procedures.

Table 30

Urinalysis Group 1 Procedures

Tabulated by Work Center

| MEPRS Code | U/A w/o Micro | U/A w/Micro | HCG | Total | Pct Total |
|---|---|---|---|---|---|
| BCBA | 60 | 228 | 385 | 673 | 5% |
| BCCA | 2800 | 2604 | 5533 | 10937 | 78% |
| BCBW | -- | -- | -- | -- | 0% |
| BCCW | 720 | 888 | 22 | 1630 | 12% |
| BCBP | -- | -- | 22 | 22 | <1% |
| BCCP | 190 | 312 | 198 | 700 | 5% |
| Total | 3770 | 4032 | 6160 | 13962 | 100% |

Comparison of tabulation to MEPRS urinalysis distributions. Table 31 compares tabulation to MEPRS summary reported weighted values. Note the high concentration within MEPRS military provider accounts. This finding is refuted by the tabulated findings, with distribution more evenly spread through the work centers, including Women's Health Clinic and Partnership providers.

Table 31

Urinalysis Group 1 Procedures -

Comparison of Tabulation to MEPRS

| MEPRS code | Tabulation Weighted Value | Pct Summary Value | MEPRS Weighted Value | Pct Summary Value |
|---|---|---|---|---|
| BCBA | 673.0 | 5% | 78.0 | <1% |
| BCCA | 10937.0 | 78% | 12463.0 | >99% |
| BCBW | 00.0 | 0% | 00.0 | 0% |
| BCCW | 1630.0 | 12% | 00.0 | 0% |
| BCBP | 22.0 | 0% | 00.0 | 0% |
| BCCP | 700.0 | 5% | 00.0 | 0% |
| Totals | 13962.0 | 100% | 12541.0 | 100% |

Note. Delta between tabulation and MEPRS weighted count was an overcount of 1421, or 11%. This was assumed to result from counting error. A conservative test was applied. If the tabulated total were reduced by the entire overage, by reducing all accounts other than BCCA (which contains virtually all the MEPRS count) by 1421, that would leave 1604 weighted procedures for distribution to accounts other than BCCA. All of these could

not be distributed to BCCA or BCBA (same provider line) as some requesting providers were in other accounts (primarily BCCW, at 12% of tabulation). It seems safe to say, then, that, even if the tabulation were wrong by 11%, it established that BCCA did not account for >99% of summary account urinalysis procedures. In the absence of other evidence, maintaining the distribution based on tabulation appeared reasonable.

Tabulated Microbiology Procedures Distribution

Tabulation of weighted microbiology procedures is shown in Table 32.

Table 32

Microbiology Groups 1, 2 & 3 Procedures

Tabulated by Work Center

| MEPRS Code | Raw Count | Combined Weighted | Weighted Value | Pct Weighted Value |
|---|---|---|---|---|
| BCBA | 70 | 8.7 | 609.0 | 5% |
| BCCA | 611 | 8.7 | 5315.7 | 39% |
| BCBW | 0 | 8.7 | -- | 0% |
| BCCW | 584 | 8.7 | 5080.8 | 37% |
| BCBP | 11 | 8.7 | 95.7 | 0% |
| BCCP | 290 | 8.7 | 2523.0 | 19% |
| Total | 1566 | | 13624.2 | 100% |

Comparison of tabulation to MEPRS microbiology distributions. Table 33 compares tabulation to MEPRS summary weighted microbiology procedures. Note the high concentration within MEPRS military provider accounts. Tabulated findings distributed summary expense account performance factors more

widely across work centers, including Women's Health Clinic and Partnership provider accounts.

Table 33

Microbiology Groups 1, 2 & 3 Procedures -

Comparison of Tabulation to MEPRS

| MEPRS Code | Tabulation Weighted Value | Tabulation Pct Summary Value | MEPRS Weighted Value | MEPRS Pct Summary Value |
|---|---|---|---|---|
| BCBA | 609.0 | 4% | 3106.7 | 23% |
| BCCA | 5315.7 | 39% | 10664.5 | 77% |
| BCBW | 00.0 | 0% | 00.0 | 0% |
| BCCW | 5080.8 | 37% | 00.0 | 0% |
| BCBP | 95.7 | <1% | 00.0 | 0% |
| BCCP | 2523.0 | 19% | 00.0 | 0% |
| Totals | 13623.4 | 100% | 13771.2 | 100% |

Note. Delta between tabulated and MEPRS count was 147, or 1%; it did not materially impact distribution patterns by provider line.

Tabulated Immunology Procedures Distribution

Table 34 displays the tabulation of weighted immunology procedures.

Table 34

Immunology Group 1 Procedures

Tabulated by Work Center

| MEPRS Code | ELISA (NOS) | Specimen Preproc | RPR | Agglut | Total | Pct Weighted Value |
|---|---|---|---|---|---|---|
| BCBA | 0 | 0 | 0 | 0 | 0 | 0% |
| BCCA | 3185 | 2510 | 1326 | 2170 | 9191 | 70% |
| BCBW | 0 | 0 | 0 | 0 | 0 | 0% |
| BCCW | 1099 | 900 | 57 | 0 | 2056 | 16% |
| BCBP | 0 | 0 | 0 | 0 | 0 | 0% |
| BCCP | 938 | 830 | 114 | 20 | 1882 | 14% |
| Total | 5222 | 4240 | 1497 | 2190 | 13129 | 100% |

Comparison of tabulation to MEPRS immunology distributions. Table 35 compares tabulation to MEPRS summary reported weighted values. Note the high concentration within MEPRS military provider accounts. Tabulated findings distributed summary expense account performance factors more widely across summary account work centers, including Women's Health Clinic and Partnership providers subaccounts.

Table 35

Immunology Group 1 Procedures -

Comparison of Tabulation to MEPRS
Weighted Value and Percent Summary Value

| MEPRS Code | Tabulation Weighted Value | Tabulation Pct Summary Value | MEPRS Weighted Value | MEPRS Pct Summary Value |
|---|---|---|---|---|
| BCBA | 0.0 | 0% | 1530.0 | 11% |
| BCCA | 9191.0 | 70% | 12535.0 | 88% |
| BCBW | 0.0 | 0% | 0.0 | 0% |
| BCCW | 2056.0 | 16% | 156.0 | 0% |
| BCBP | 0.0 | 0% | 0.0 | 0% |
| BCCP | 1882.0 | 15% | 0.0 | 0% |
| Totals | 13129.0 | 100% | 14221.0 | 100% |

Note. Delta between tabulated and MEPRS count was 1092, or an 8% undercount. Undercount was assumed to result from tabulation error. A conservative test was applied against resulting distribution. If the undercount were removed from tabulation by reducing all accounts except BCBA and BCCA, that would leave 2846 weighted procedures still unaccounted for. Some of these would have to be charged to Women's Health Clinic or Partnership accounts, based on the results of tabulation. Absent evidence to the contrary, maintaining the distribution above seemed reasonable.

Recapitulation of Clinical Pathology Tabulation

Table 36 displays the recapitulation of tabulated and MEPRS weighted values for Clinical Pathology. Array is by provider line rather than work center. Although tabulation was facilitated by work center accounts, the distinction between obstetric and gynecologic care was not material to the hypothesis (verification of Partnership provider-line ancillary performance procedures distribution). Table 37, showing this data in percentages, follows Table 36.

Table 36

Clinical Pathology Summary Weighted Values

Comparison of Tabulation to MEPRS -

- MEPRS "Location"/Clinical Pathology Branch -

| Provider Line | Chem | Hem | U/A | Micro | Immun | Total |
|---|---|---|---|---|---|---|
| BCBA/BCCA | | | | | | |
| Tab | 233.6 | 3844.0 | 11610.0 | 5924.7 | 9191.0 | 30803.3 |
| MEPRS | 1403.3 | 4856.0 | 12541.0 | 13771.2 | 14065.0 | 46636.5 |
| BCBW/BCCW | | | | | | |
| Tab | 386.0 | 448.0 | 1630.0 | 5080.8 | 2056.0 | 9600.0 |
| MEPRS | 0.0 | 0.0 | 0.0 | 0.0 | 156.0 | 156.0 |
| BCBP/BCCP | | | | | | |
| Tab | 783.4 | 630.0 | 722.0 | 2618.7 | 1882.0 | 6636.1 |
| MEPRS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | | | | | | |
| Tab | 1403.0 | 4922.0 | 13962.0 | 13623.4 | 13129.0 | 47039.4 |
| MEPRS | 1403.3 | 4856.0 | 12541.0 | 13771.2 | 14221.0 | 46792.5 |

Note. Delta between tabulation count and MEPRS was 246.9, or <1%. This did not materially impact cost analysis.

Table 37

Clinical Pathology Percentages -

Comparison of Tabulation to MEPRS

| Provider Line | - MEPRS "Location"/Clinical Pathology Branch - Chem | Hem | U/A | Micro | Immun | Total |
|---|---|---|---|---|---|---|
| BCBA/BCCA | | | | | | |
| Tab | 17% | 78% | 83% | 43% | 70% | 66% |
| MEPRS | 100% | 100% | 100% | 100% | 100% | 99% |
| BCBW/BCCW | | | | | | |
| Tab | 28% | 9% | 12% | 37% | 16% | 20% |
| MEPRS | 0 | 0 | 0 | 0 | 0 | 1% |
| BCBP/BCCP | | | | | | |
| Tab | 56% | 13% | 5% | 19% | 14% | 14% |
| MEPRS | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | | | | | | |
| Tab | 100% | 100% | 100% | 100% | 100% | 100% |
| MEPRS | 100% | 100% | 100% | 100% | 100% | 100% |

## Blood Bank Weighted Procedures Tabulation

### Tabulated Blood Bank Procedures Distribution

Table 38 shows the tabulation of weighted blood bank procedures.

Table 38

Blood Bank Group 1 Procedures

Tabulated by Work Center

| MEPRS Code | Raw Count | Combined Weight | Weighted Value | Pct Weighted Value |
|---|---|---|---|---|
| BCBA | -- | 38 | -- | 0% |
| BCCA | 510 | 38 | 19380 | 94% |
| BCBW | -- | 38 | -- | 0% |
| BCCW | 9 | 38 | 342 | 2% |
| BCBP | -- | 38 | -- | 0% |
| BCCP | 24 | 38 | 912 | 4% |
| Total | 543 | | 20634 | 100% |

Comparison of tabulation to MEPRS blood bank distributions. Table 39 compares tabulation to MEPRS summary reported weighted values. Note the high concentration within military provider accounts in the MEPRS data. The tabulated findings distributed summary expense account performance factors more widely across summary account work centers, including Women's Health Clinic and Partnership providers.

Table 39

Blood Bank Group 1 Procedures -

Comparison of Tabulation to MEPRS

| MEPRS Code | Tabulation Weighted Value | Tabulation Pct Summary Value | MEPRS Weighted Value | MEPRS Pct Summary Value |
|---|---|---|---|---|
| BCBA | 000.0 | 0% | 7.0 | <1% |
| BCCA | 19380.0 | 94% | 23940.0 | >99% |
| BCBW | 00.0 | 0% | 00.0 | 0% |
| BCCW | 342.0 | 2% | 00.0 | 0% |
| BCBP | 00.0 | 0% | 00.0 | 0% |
| BCCP | 912.0 | 4% | 00.0 | 0% |
| Totals | 20634.0 | 100% | 23947.0 | 100% |

Note. Delta between tabulated and MEPRS weighted count was 3313, or 16% undercount. Missing data were believed to account for the 16% delta. To test the distribution pattern which resulted from tabulation, a conservative test was applied. If all the missing data were added to MEPRS account BCCA, which constituted virtually all MEPRS blood bank values, that would leave 4% in accounts BCCW and BCCP, based on tabulation. This was close to the tabulated value of 6% for these two accounts. Absent evidence to the contrary, the distribution pattern resulting from tabulation seemed reasonable.

## Anatomical Pathology Weighted Procedures Tabulation

### Tabulated Histology Procedures Distribution

Table 40 shows the results of tabulation of histology procedures.

Table 40

Tabulation of Histology Group 1 Procedures

| MEPRS Code | Raw Count | Combined Weight | Weighted Value | Pct Weighted Value |
|---|---|---|---|---|
| BCBA | 97 | 30.3 | 2939.1 | 35% |
| BCCA | 0 | 30.3 | 0.0 | 0% |
| BCBW | 1 | 30.3 | 30.3 | <1% |
| BCCW | 0 | 30.3 | 0.0 | 0% |
| BCBP | 176 | 30.3 | 5332.8 | 64% |
| BCCP | 0 | 30.3 | 0.0 | 0% |
| Total | 274 | | 8302.2 | 100% |

Comparison of tabulation to MEPRS histology distribution. Table 41 compares histology tabulation to MEPRS summary weighted values. Note the high concentration within military provider accounts in the MEPRS data. The tabulated findings distributed summary performance factors more widely across summary account work centers, both Women's Health Clinic and Partnership work centers.

Table 41

Histology Group 1 Procedures -

Comparison of Tabulation to MEPRS

| MEPRS Code | Tabulation Weighted Value | Tabulation Pct Summary Value | MEPRS Weighted Value | MEPRS Pct Summary Value |
|---|---|---|---|---|
| BCBA | 2939.1 | 35% | 5866.0 | 88% |
| BCCA | 0.0 | 0% | 33.0 | <1% |
| BCBW | 30.3 | <1% | 00.0 | 0% |
| BCCW | 0.0 | 0% | 00.0 | 0% |
| BCBP | 5332.0 | 65% | 758.0 | 11% |
| BCCP | 0.0 | 0% | 00.0 | 0% |
| Totals | 8271.1 | 100% | 6657.0 | 99% |

Note. The delta between tabulation and MEPRS weighted value was 1614, or 24%. Error was believed to result from overestimation of the value of Group 1 procedures. A conservative test was applied. If the entire tabulated overage were subtracted from accounts other than BCBA (the account which contains 88% of MEPRS procedures), it would have to come almost entirely from BCBP. That would still leave 3718 weighted procedures in BCBP, or more than 55% of the MEPRS weight. Based on tabulation, a certain share of procedures have to be credited to BCBP as well as to BCBA. Absent evidence to the contrary, maintaining the tabulated distribution appeared reasonable.

## Diagnostic Radiology Weighted Procedures Tabulation

### Tabulated Ultrasound Procedures Distribution

Table 42 displays the results of tabulation of diagnostic radiology procedures by work center.

Table 42

Tabulation of Diagnostic Radiology Group 1 Procedures

| MEPRS Code | Raw Count | Combined Weight | Weighted Value | Pct Weighted Value |
|---|---|---|---|---|
| BCBA | 20 | 10.8 | 216.0 | 5% |
| BCCA | 7 | 10.8 | 75.6 | 2% |
| BCBW | 0 | 10.8 | 0.0 | -- |
| BCCW | 131 | 10.8 | 1414.8 | 33% |
| BCBP | 5 | 10.8 | 54.0 | 1% |
| BCCP | 230 | 10.8 | 2484.0 | 59% |
| Total | 393 | | 4244.4 | 100% |

Comparison of tabulation to MEPRS ultrasound distributions. Table 43 compares ultrasound procedures tabulation to MEPRS summary weighted values. Note the high concentration within military provider accounts in the MEPRS data. The tabulated findings distributed summary expense account performance factors more widely across work centers, including Women's Health Clinic and Partnership providers.

Table 43

Diagnostic Radiology Group 1 Procedures -

Comparison of Tabulation to MEPRS

| MEPRS Code | Tabulation Weighted Value | Tabulation Pct Summary Value | MEPRS Weighted Value | MEPRS Pct Summary Value |
|---|---|---|---|---|
| BCBA | 216.0 | 5% | 394.6 | 8% |
| BCCA | 74.2 | 2% | 4613.1 | 92% |
| BCBW | 0.0 | -- | 0.0 | 0% |
| BCCW | 1388.6 | 33% | 0.0 | 0% |
| BCBP | 53.0 | 1% | 0.0 | 0% |
| BCCP | 2438.0 | 59% | 0.0 | 0% |
| Totals | 4244.4 | 100% | 5007.7 | 100% |

Note. Delta between tabulation and MEPRS equaled 763.3, or 18%. Delta was assumed to result from underestimation of the weighted frequency of Group 1 procedures. A conservative test was applied. If the entire undercount were added to accounts BCBA or BCCA, that would place only 21% of weighted procedures in these accounts, and the major share in remaining accounts. Absent contradictory evidence, the above distribution appeared reasonable.

## Pharmacy Weighted Procedures Tabulation

### Pharmacy Service Procedures Tabulation

Pharmacy Service data on number of prescriptions and refills were grouped by ambulatory obstetrics-gynecology provider lines (MEPRS subaccounts). Data are presented in Table 44.

Table 44

Prescription and Refill Performance

by Provider Line

| Provider Line | Raw Count | Weighted Frequency |
|---|---|---|
| BCBA/BCCA | 1363 | 1363 |
| BCBW/BCCW | 741 | 741 |
| BCBP/BCCP | 1393 | 1393 |
| Total | 3497 | 3497 |

Comparison of pharmacy data to MEPRS pharmacy distributions.

Table 45 compares summary account provider-line data to MEPRS pharmacy performance distributions.

Table 45

Presciptions and Refills

Comparison of Pharmacy Database to MEPRS

| Provider Line | Pharmacy Data Weighted Value | Pharmacy Data Pct Summary Value | MEPRS Weighted Value | MEPRS Pct Summary Value |
|---|---|---|---|---|
| BCBA/BCCA | 1363 | 39% | 2542 | 73% |
| BCBW/BCCW | 741 | 21% | 0 | -- |
| BCBP/BCCP | 1393 | 40% | 955 | 27% |
| Total | 3497 | 100% | 3497 | 100% |

Recapitulation of Ancillary Services Procedures Tabulation

Table 46 below recapitulates tabulation and MEPRS ancillary service values. Array is by provider line rather than by work center. Although tabulation was facilitated by work center

accounts, the distinction between obstetric and gynecologic care was not material to the hypothesis (verification of Partnership provider-line ancillary performance procedures distribution). Table 47, showing distribution percentages, follows Table 46.

Table 46

Ancillary Services Weighted Values -

Comparison of Tabulation to MEPRS by Provider Line

| MEPRS Code | - MEPRS Ancillary Service System - Clin Path | BB | Anat Path | Diag Rad | Pharmacy | Total |
|---|---|---|---|---|---|---|
| BCBA/BCCA | | | | | | |
| Tab | 30803.3 | 19380.0 | 2939.1 | 286.3 | 1363.0 | 54771.7 |
| MEPRS | 46636.5 | 23947.0 | 5899.0 | 5007.7 | 2542.0 | 84031.9 |
| BCBW/BCCW | | | | | | |
| Tab | 9600.0 | 342.0 | 30.3 | 1388.6 | 741.0 | 12071.6 |
| MEPRS | 156.0 | 0.0 | 0.0 | 0.0 | 0.0 | 156.0 |
| BCBP/BCCP | | | | | | |
| Tab | 6636.1 | 912.0 | 5332.0 | 2491.0 | 1393.0 | 16763.7 |
| MEPRS | 0.0 | 0.0 | 758.0 | 0.0 | 955.0 | 1713.0 |
| Total | | | | | | |
| Tab | 47039.4 | 20634.0 | 8271.0 | 4244.4 | 3497.0 | 83607.0 |
| MEPRS | 46792.5 | 23947.0 | 6657.0 | 5007.7 | 3497.0 | 85901.2 |

Note. Delta between tabulation and MEPRS was a value of 2215.4, or <3%. This was a relatively small percentage, and was immaterial in terms of accepting or rejecting the null hypothesis, which was based on distribution of summary ancillary performance procedures to Partnership provider lines.

Table 47

Percentage Comparison of Tabulation to MEPRS Values by Provider Line

| Provider Line | - MEPRS Ancillary Service System - Clin Path | BB | Anat Path | Diag Rad | Pharmacy | Total |
|---|---|---|---|---|---|---|
| BCBA/BCCA | | | | | | |
| Tab | 66% | 94% | 36% | 7% | 39% | 66% |
| MEPRS | >99% | 100% | 89% | 100% | 73% | 98% |
| BCBW/BCCW | | | | | | |
| Tab | 20% | 2% | <1% | 33% | 21% | 14% |
| MEPRS | <1% | 0.0 | 0.0 | 0.0 | 0.0 | <1% |
| BCBP/BCCP | | | | | | |
| Tab | 14% | 4% | 64% | 59% | 40% | 20% |
| MEPRS | 0.0 | 0.0 | 11% | 0.0 | 27% | 2% |
| Total | | | | | | |
| Tab | 100% | 100% | 100% | 100% | 100% | 100% |
| MEPRS | 100% | 100% | 100% | 100% | 100% | 100% |

## Cost Analysis

### Comparison of Tabulation to MEPRS Total and Average Costs

MEPRS summary cost analysis. The MEPRS summary account cost analysis for October 1991, presented in Table 48, shows total and average costs by provider line (Obstetrics-Gynecology Clinic; Women's Health Clinic; and Partnership providers). As the distinction between ambulatory obstetrics and ambulatory gynecology was considered immaterial, combined obstetrics-gynecology costs were used.

This was a partial analysis only, as it did not reflect support costs, purification, direct expenses, and military pay.

Although data for these lines were available, it was not clear how to standardize expenses in these categories across provider lines, given some obvious omissions: For example, although six military nurse midwives saw outpatients in the Women's Health Clinic, military pay was only entered against the non-Partner, non-Women's Health, Obstetrics-Gynecology Clinic. At $109,292, this sum would impact significantly on total and average costs!

The cost analysis was modified in another respect, critical to the calculation of unit cost: Total visits and dispositions reflected monthly statistical data from the Patient Appointment Service information system, TRIPAS, rather than MEPRS data.

This modification was considered necessary to standardize data across provider lines, based on the following reasoning: First, number of visits and dispositions reflected in MEPRS bore no clear relationship to ambulatory visits registered with the Patient Appointment Service; it was misleading to provide these figures as if they represented ambulatory visits. Second, past studies (Murdock, 1991) of ambulatory obstetrics-gynecology visits demonstrated that TRIPAS data were fairly reliable, in that they reflected non-scheduled visits as well as scheduled appointments. Third, MEPRS visits and dispositions data appeared to undercount ambulatory visits to Women's Health by a considerable margin, while overcounting visits to Obstetrics-Gynecology Clinic. By TRIPAS, the number of ambulatory

obstetrics-gynecology visits to Women's Health Clinic (excluding Partnership providers) was 1512; MEPRS reported a figure of 294. Conversely, TRIPAS showed that the Obstetrics-Gynecology Clinic saw 2,797 patients; the MEPRS figure for visits and dispositions was 12,639. Partnership provider data, while less divergent at 1,917 (TRIPAS) and 4,860 (MEPRS), was still too disparate to overlook. Therefore, the course chosen was to utilize TRIPAS data.

Table 48

MEPRS Ambulatory Obstetrics-Gynecology

Cost Analysis for October 1991

| | Ob-Gyn Clinic | WH Clinic | Partner |
|---|---|---|---|
| Pharmacy | $101,688 | $ 0 | $25,963 |
| Pathology | 121,115 | 0 | 33 |
| Anatomical Pathology | 35,949 | 0 | 6,615 |
| Blood Trans | 35,282 | 0 | 0 |
| Radiology | 62,819 | 0 | 180 |
| EKG | 35 | 0 | 0 |
| EEG | 0 | 0 | 0 |
| EMG | 0 | 0 | 0 |
| Pulmonary Functions | 0 | 0 | 0 |
| CSS | 5,602 | 0 | 0 |
| CMS | 0 | 0 | 0 |
| Anest | 0 | 0 | 0 |
| OR | 0 | 0 | 0 |
| RR | 0 | 0 | 0 |
| SDSC | 0 | 0 | 0 |
| Inhhal Therapy | 0 | 0 | 0 |
| OT | 440 | 31 | 0 |
| Phys Med | 0 | 0 | 0 |
| PT | 1,915 | 0 | 400 |
| Nuclear Medicine | 23,784 | 1,088 | 117 |
| Total Ancillary Cost (from all services) | $ 388,629 | $1,119 | $33,308 |
| divided by Total Visits to derive Cost per Visit | 2,797 | 1,512 | 1,917 |
| | $ 138.94 | $ .74 | $ 17.37 |

Summary cost analysis based on tabulated procedures. Cost analyses based on redistribution of MEPRS ancillary service values followed tabulation. As in the MEPRS cost analysis above, only ancillary service expenses were reflected. Visit data reflected TRIPAS statistics.

Major ancillary service expenses were redistributed based upon tabulated distribution of ancillary service procedures. As discussed above, ancillary service expenses in specific areas were reduced by the balance of excluded weighted values before total costs were redistributed by tabulated percentages. In Clinical Pathology, expenses were broken out by excluded and included location percentages; then the latter were redistributed. Table 49 displays redistributed expenses.

Table 49

Redistributed Ambulatory Obstetrics-Gynecology Costs

for October 1991

| | Ob-Gyn Clinic | WH Clinic | Partner |
|---|---|---|---|
| Pharmacy | $ 49,784 | $ 26,807 | $ 51,060 |
| Pathology | 92,739 | 14,887 | 10,421 |
| Anatomical Pathology | 14,404 | 200 | 25,406 |
| Blood Trans | 31,175 | 663 | 1,327 |
| Radiology | 12,207 | 18,067 | 32,337 |
| EKG | 35 | 0 | 0 |
| EEG | 0 | 0 | 0 |
| EMG | 0 | 0 | 0 |
| Pulmonary Functions | 0 | 0 | 0 |
| CSS | 5,602 | 0 | 0 |
| CMS | 0 | 0 | 0 |
| Anest | 0 | 0 | 0 |
| OR | 0 | 0 | 0 |
| RR | 0 | 0 | 0 |
| SDSC | 0 | 0 | 0 |
| Inhhal Therapy | 0 | 0 | 0 |
| OT | 440 | 31 | 0 |
| Phys Med | 0 | 0 | 0 |
| PT | 1,915 | 0 | 400 |
| Nuclear Medicine | 23,784 | 1,088 | 117 |
| Total Ancillary Cost (from all services) | $ 232,085 | $ 61,743 | $ 121,068 |
| divided by Total Visits to derive Cost per Visit | 2,797 | 1,512 | 1,917 |
| | $ 82.98 | $ 40.83 | $ 63.15 |

## Discussion

### MEPRS Data

As recent events in this era of decentralized accountability have shown, performance and cost data about health care delivery options could determine which programs will survive and which will not. Systems such as MEPRS, that are capable of capturing cost and productivity data by provider-line, could well become factors which local medical treatment facilities can ill afford to ignore. However, based on the study, the precision with which MEPRS was intended to ancillary service use by provider category appeared instead to have resulted in misreporting for most categories. That the differential between provider line ancillary service costs would approach the dimensions suggested by the MEPRS data surpassed reason; it was much more reasonable to suppose that MEPRS failed to capture the actual use of ancillary services by provider line.

The difficulty of comparing databases was also underscored by this study. MEPRS visits and dispositions data bore no relationship to TRIPAS visits data, although both were for the same ambulatory clinics in the same department during the same time period. Just as MEPRS was created so that reporting would be standardized and uniform, such standardization and uniformity would enhance the utility of the information systems on which the local medical treatment facility relies.

## Cost Analyses

Cost analyses based on tabulation did reflect a substantial, credible delta between provider line costs. While total costs for Partnership and Women's Health Clinic providers were considerably higher than reported by MEPRS, per visit ancillary service costs to Partnership providers were 24% lower than ambulatory, non-Partner, Obstetrics-Gynecology ancillary service costs. This is of particular note, given the use made of summary account data, rather than provider line data, to justify Partnership agreements. Lower costs associated with Partnership provider ancillary service use would appear to favor the use of this delivery option in the direct expense facility.

## The Need for Utilization Studies

However, while this would appear to support the cost effectiveness of Partnership providers in this department, this finding would be open to debate until confirmed by utilization studies.

That Women's Health Clinic ancillary service costs per visit were 36% lower than Partnership costs, and 51% lower than Obstetrics-Gynecology Clinic costs, was also informative. Again, inferences about cost-effectiveness would be premature, given that no references to medical records nor outcomes have been made. Subsequent studies on outcomes and utilization patterns, however, may prove interesting.

## Conclusions and Recommendations

### Conclusions

Based on the study, it appeared that the distribution of weighted performance procedures in MEPRS did not reflect the actual distribution of these procedures by provider line (fourth-level MEPRS code). The use of major ancillary services by departmental Partnership providers, reported by MEPRS at 2% of ambulatory summary account use, was found to account for 20% of summary account ancillary service use.

Total and average cost analyses based on MEPRS did not reflect the actual distribution of ancillary service expenses by provider line. MEPRS cost analysis appeared to underreport the total ancillary service cost by Partnership providers by approximately 72%, or approximately $87,760. Conversely, ancillary service use by military providers in ambulatory obstetrics-gynecology clinics was overreported by almost 60%, or $156,544.

However, given the productivity of Partnership providers, the average ancillary service cost per outpatient visit was found to be lower for Partnership providers than for Obstetrics-Gynecology Clinic military providers by 24%. Women's Health Clinic providers ancillary service costs per outpatient visit were the lowest of the three provider lines: These were 36% lower than Partnership costs and 51% lower than Obstetrics-

Gynecology clinic costs.

The finding that Partnership ancillary service costs were lower than military providers costs appeared to favor the use of provider-specific data in preparation of Partnership agreement justifications. However, given that MEPRS data effectively ignores all but the military obstetrics-gynecology codes, use of MEPRS data would be premature. The apparent assumption that the distribution of weighted procedures in MEPRS ancillary service summaries was skewed toward military provider accounts appeared to be justified. Until data collection improves, marginal use can be made of the results of this study.

## Recommendations

A study of the MEPRS system, to determine how the system could be used to successfully capture provider-line performance data, is recommended. Improvements in data capture could materially improve the information available to local commanders on the relative cost of health care delivery options.

Such a study should point out the preposterous delta in ancillary service use between provider lines presently reflected in MEPRS data, as means of showing the woeful lack of reliable cost information with which to make sound decisions. It should also underscore the relationship between cost and productivity; higher total costs do not necessarily reflect higher unit costs, as this study showed.

## References

Assistant Secretary of Defense (Health Affairs). (1992, January 8). Coordinated Care Program. (Available from Office of the Assistant Secretary of Defense (Health Affairs), Washington, D.C.).

Assistant Secretary of Defense (Health Affairs). (1986, January 31). Medical Expense and Performance Reporting System for Fixed Military Medical and Dental Treatment Facilities. (Available from Office of the Assistant Secretary of Defense (Health Affairs), Washington, D.C.).

Assistant Secretary of Defense (Health Affairs). (1987, October 22). Military-Civilian Health Services Partnership Program. (Available from Office of the Assistant Secretary of Defense (Health Affairs), Washington, D.C.).

Bunker, J. P., Roos, L. L., Fowles, J., & Roos, N. P. (1986.) Four information systems and routine monitoring. In W. Holland (Ed.), Oxford Textbook of Public Health. New York: Oxford University Press.

College of American Pathologists. (1991). Workload recording method & personnel management manual (1992 ed.). Northfield, IL: Author.

Daniels, W. W. (1983). Biostatistics: a foundation for analysis in the health sciences. New York: John Wiley.

Eisenberg, J. M. (1986). Doctors' decisions and the cost of medical care. Ann Arbor, MI: Health Administration Press.

Jacobs, P. (1991). The economics of health and medical care (3rd ed.). Gaithersburg, MD: Aspen.

Johnson, A. N., Appel, G. L. (1984). DRG's and hospital case records: implications for Medicare case mix accuracy. Inquiry, 21, 128-134.

Leonard, T. (1991). [Cost Analysis of Partnership Program]. Unpublished raw data.

Leonard, T. (1992). [Partnership Clinic Visits]. Unpublished raw data.

Naisbitt, J. (1982). Megatrends. New York: Warner Communications.

Murdock, B. (1992). [Conflicting Identification Data Elements on Clinical Pathology Request Forms]. Unpublished raw data.

Murdock, B. (1991) [TRIPAS Appointments in the Department of Obstetrics-Gynecology, FY 91]. Unpublished raw data.

Roos, N. P., & Roos, L. L., (1982). Surgical rate variations: do they reflect the health or socioeconomic characteristics of the population? Medical Care, 10(9), 945-958.

Weissenstein, E. (1992, March 23). CHAMPUS reform shift draws ire. Modern Healthcare, p. 14.

U.S. Army Medical Activity, Fort Hood, Texas (1991). [Ancillary workload, first quarter, FY 92]. Unpublished raw data.

U.S. Army Medical Activity, Fort Hood, Texas (1991, July). [MEPR Code List]. Unpublished list.

Effectively, however, until users of the system recognize that they have a stake in improving its accuracy, there is little reason to suppose that performance data collection will improve. So long as performance data collection has no perceived bearing on departmental budgets, it is likely to be viewed as a meaningless exercise. The challenge will be to create incentives at the user level, so that a system capable of providing significant insight into direct health care expenses will deliver the data with which sound decisions can be made.

Finally, utilization studies are strongly recommended before any health care delivery decisions are made based on cost and performance data alone.