

Running Head: IMPROVING OUTPATIENT CODING

Army-Baylor University Graduate Program  
in Health Care Administration

Graduate Management Project

Evaluating the Coding and Workload Accounting Improvement Initiative  
at Madigan Army Medical Center

Presented to:

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## Abstract

The purpose of this study was to evaluate the Coding and Workload Accounting Improvement Initiative (CWAI) at Madigan Army Medical Center (MAMC). The CWAI aims to improve MAMC's outpatient clinical workflow and business processes, nurse and medical technician workload documentation, provider coding accuracy and education, and clinic electronic medical record (AHLTA) usage. The desired end state of the CWAI is improved medical documentation and coding accuracy at MAMC. Data were analyzed using descriptive statistics and Pearson's chi-square test to assess the CWAI before and after data. Results indicate statistically significant improvements in coding accuracy and compliance. An additional CWAI byproduct was increased provider productivity and a statistically significant increase in clinic AHLTA usage. Results indicate the CWAI does indeed have a statistically significant positive impact on the MAMC outpatient coding program. The author recommends sustaining the current CWAI program, as well as adding additional educational programs to best facilitate accurate coding results.



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#### Disclaimer

The views expressed in this study are those of the author and do not reflect the official policy or position of the Department of Defense, Department of the Army, Madigan Army Medical Center or the U.S. Government.

#### Statement of Ethical Conduct in Research

The author declares no conflict of interest or financial incentives in any product or service mentioned in this article. The confidentiality of individuals whose data may have been used in this study was protected at all times and under no circumstances will be discussed or released to outside agencies.

## Introduction

The importance of coding has always been understood – proper coding allows medical staff to monitor their individual patients and overall population health status, assess the best outcomes, and manage productivity and reimbursements for services rendered. Until recently, the Military Health System (MHS) did not utilize coding for internal reimbursement activities. Careful attention was focused on coding third party insurance collection documentation, because it was the only source of reimbursement for the MHS based on workload. However, with the implementation of the Army Medical Command Performance Based Adjustment Model (PBAM), Army Medical Treatment Facilities' (MTF) budgets will be supplemented based on facility workload. Outpatient workload and complexity is captured in Relative Value Units (RVU). RVUs are calculated through analyzed documentation into medical record coding. Coding accuracy will therefore directly impact MTF reimbursement.

Madigan Army Medical Center (MAMC) has recently implemented a local program called the Coding and Workload Accounting Improvement (CWA) initiative. The CWA aims to improve MAMC's outpatient clinical workflow and business processes, nurse and medical technician workload documentation, and provider coding timeliness, accuracy and education. The desired end state of the CWA is improved medical documentation, submission timeliness and coding accuracy at MAMC. Increased productivity may be a byproduct of more accurate coding via improved documentation. Additionally, providers may be more likely to utilize the electronic medical record due to increased user training.

*Conditions that Prompted the Study*

Medical record coding is a critical component for proper medical record documentation. While it can provide a detailed clinical picture of a patient population, it can also be useful in overseeing population health, anticipating demand, assessing quality outcomes and standards of care, managing business activities, and receiving reimbursements for services. William Winkenwerder, Jr., MD, former Assistant Secretary of Defense for Health Affairs, directed “prompt and direct medical documentation and coding” (2003). In a Department of Defense (DoD) Directive dated April 13, 2004, former Deputy Secretary of Defense, Paul Wolfowitz, called for 100% medical records coding accuracy starting in FY 2006.

Proper coding, monitored through a corporate compliance plan, may reduce fraudulent billing practices. The Government Accountability Office (GAO) estimates that three to ten percent of health care dollars are lost to fraud each year. According to the Centers for Medicare and Medicaid, national healthcare expenditures topped \$1.3 trillion in 2000 (Internal Revenue Service, 2006). While it is difficult to determine the exact amount of fraud, the total dollar amount could be staggering. During Fiscal Year (FY) 2005, the Federal Government won or negotiated approximately \$1.47 billion in judgments and settlements stemming from health care fraud (Department of Health and Human Services, 2006).

As of July 2006, Madigan Army Medical Center had 29,552 inferred outpatient encounters representing possible revenue totaling nearly \$1.5 million, after assuming 75% of the encounters are revenue (derived from the Prospective Payment System (PPS) rates) and not system error. A patient encounter is defined as documenting the patient's



arrival, care plan and diagnosis. Inferred encounters are either incomplete or contain errors which will not allow the encounter to process in the database. An encounter becomes "inferred" if not completed in the Standard Ambulatory Data Records (SADR) database within 72 working hours. Reasons for the high number of inferred encounters include the MHS's electronic medical record (EMR) (Armed Forces Health Longitudinal Technology Application (AHLTA)) errors, clinic business practices and/or provider training and noncompliance. AHLTA implementation in October 2005 at MAMC was met with some resistance from providers and staff. AHLTA usage is critical to capturing workload in the medical center. With the implementation of the PBAM, MAMC could lose millions of reimbursement dollars for patient care actually provided!

Madigan Army Medical Center's local CWAI initiative was developed by the Patient Administration Division (PAD) in order to improve our workload accounting. MAMC leadership realized a need for an initiative to better improved clinic workflow, documentation and AHLTA usage. Coding audits consistently indicated tardy patient encounter documentation (compliance). Provider documentation did not support the assigned codes or did not adequately note the actual level of services provided (accuracy). Accurate documentation drives appropriate codes which is the best indicator of productivity.

The CWAI consists of approximately one week of senior coding and informatics staff conducting a workflow analysis of the front desk clerks, paraprofessionals, nursing staff, and clinical providers. The CWAI coding expert was a Certified Professional Coder (CPC) and a Certified Coding Specialist-Professional (CCS-P) with eight years experience. The coding expert focused on the clinic workflow and coding and the

informatics staff assisted clinical personnel with issues related to using AHLTA. Part of the intent of the CWAI is to educate the clinical staff in order to be more comfortable using AHLTA. The CWAI consists of four phases. Phase one consists of the CWAI staff collecting relevant coding and productivity data. The data collection allows the CWAI staff to focus their efforts on certain areas. For example, the data may indicate a need for improved nursing documentation or increased provider AHLTA training. Phase two begins when the CWAI staff conducts an in-brief with the clinic leadership and coding staff. The intent of the in-brief is to explain the intent of the CWAI, discuss the phase one CWAI coding data, explain the role of the clinic coder and solicit buy-in from the clinic staff. Next, in phase three, the CWAI staff conducts the clinic workflow analysis. If an issue is noted with AHLTA training during the workflow analysis, an appointment for individual AHLTA follow-up training can be given on the spot. The CWAI coding specialist conducts "shadowing" with a select number of providers. The shadowing allows the CWAI coding specialist to provide one-on-one assistance to many clinic providers. Phase four begins once the workflow analysis is completed. In this phase, the PAD coding staff discusses common coding problems with the clinic staff. This educational session is conducted separately for each clinical role: front desk clerks, paraprofessionals and nurses, and providers. For some clinical staff, the CWAI is the first time they have received specific coding training. AHLTA training is generic, not specific to a provider's specialty, and therefore coding is not covered in this training. The CWAI also provides an opportunity for the clinic coders to integrate with their clinic's medical staff. Additionally, AHLTA training can be addressed by the MAMC informatics staff in order to facilitate easier documentation in the EMR. Once the CWAI is complete, the

PAD coding staff discusses their findings and recommendations with the clinic's leadership. Finally, the clinic staff is educated and encouraged to monitor and sustain the CWAI principles through specific focused data collection methods.

### *Statement of the Problem*

The purpose of this study is to determine whether the Coding and Workload Accounting Improvement initiative will:

1. Improve Madigan Army Medical Center's provider coding accuracy (correctly coded encounters).
2. Improve compliance - did the encounter process in the CHCS system within 72 working hours?
3. Increase provider productivity (RVU per encounter).
4. Increase provider AHLTA usage.

### Literature Review

#### *The History of Coding*

Diagnostic coding began as a means of gathering statistical information to track mortality and morbidity. Subsequent changes to add clinical information resulted in a coding structure that describes the clinical picture of a patient, as well as non-medical reasons for seeking care and causes of injury. Diagnoses coding has been in existence since the 17<sup>th</sup> century when early physicians attempted to classify diseases based on different categories of sickness (World Health Organization, 2006). In later years,



European physicians began to apply statistics to mortality and morbidity. The International Statistics Institute prepared a list of causes of death in 1891. The Institute also published 3 revisions in 1900, 1910 and 1920 (WHO, 2006). The Institute partnered with the Health Organization of the League of Nations to publish two additional revisions. In 1946, the Interim Committee of the World Health Organization was entrusted to review the existing list of causes of death and develop a new classification system of morbidity. The resulting classification was circulated to national governments, preparing morbidity and mortality statistics, for comments and suggestions under the title, *International Classification of Diseases, Injuries, and Causes of Death* (WHO, 2006). The sixth, seventh and eighth revisions were developed in 1948, 1955 and 1965, respectively. The MHS currently uses the ninth revision, referred to as the *International Classification of Diseases, 9<sup>th</sup> revision, Clinical Modifications* (ICD-9-CM), which was developed in 1975.

Procedural coding was developed by the American Medical Association (AMA) in 1966. The AMA produced the Current Procedural Terminology (CPT) to encourage the use of standard terms and descriptors to document procedures in the medical record. This standardization also communicated accurate information on procedures and services to agencies concerned with insurance claims. These codes also allowed statistical analysis in a computer oriented system (AMA, 2006a). A second edition to the CPT in 1970 introduced a five-digit coding system, replacing the old four-digit system. In the mid to late 1970s, the third and fourth editions of CPT were introduced. The fourth edition, published in 1977, represented significant updates in medical technology and a system of periodic updating was introduced to keep pace with the rapidly changing medical environment. In 1983, CPT was adopted as part of the Centers for Medicare and



Medicaid Services (CMS), formerly Health Care Financing Administration's (HCFA), Healthcare Common Procedure Coding System (HCPCS) (AMA, 2006a).

HCPCS (pronounced *hicks-picks*) codes are grouped in two levels:

Level I HCPCS are commonly referred to as Current Procedural Terminology (CPT).

They form the major portion of the HCPCS coding system, covering most services and procedures. CPT codes supersede Level II codes when the verbiage is identical.

Level II codes supersede level I codes for similar encounters, when the verbiage of the level II code is more specific. HCPCS includes evaluation and management services, other procedures, supplies, materials, injectables, and dental codes. Having a code number listed in a specific section of HCPCS does not usually restrict its use to a specific profession or specialty. (Unified Biostatistical Utility (UBU), 2006)

In the DoD, the term evaluation and management (E/M) codes refers to the CPT codes inclusive of 99201–99499. These codes describe the non-procedural portion of services furnished during a healthcare encounter. They classify services provided by a healthcare provider and indicate the level of service. E/M codes are a subset of CPT codes (Level I HCPCS), yet are referred to as an E/M instead of as a CPT code to distinguish between E/M services and procedural coding (UBU, 2006). According to the CMS, E/M services remain one of the top two coding billing errors in 2004 (Linker, 2005).

#### *Relative Value Units*

The Relative Value Unit (RVU) was developed as a part of the Resource-Based Relative Value Scale (RBRVS). The RBRVS was created in 1986 by the Harvard School of Public Health in order to establish a physician payment schedule based on resources used to deliver health care. The cost of providing each service is divided into three

components: physician work, practice expense and professional liability insurance.

Payments are calculated by multiplying the combined costs of a service by a conversion factor (a monetary amount that is determined by the Centers for Medicare and Medicaid Services). Payments are also adjusted for geographical differences in resource costs. The physician work component accounts, on average, for 52 percent of the total relative value for each service. (AMA, 2006b) The MHS currently uses only the physician work portion of the RVU. The RVU is currently the best measurement of provider productivity. An accurate accounting of productivity is captured through proper coding. For example, documentation for a new patient, defined as those patients not seen by a physician in the previous three years, generate a higher RVU than an established patient encounter. The reason for the higher RVU is due to the time required for the encounter and the intensity of the workload: the history, physical examination, and decision making (Filler, 2007).

#### *Who Codes?*

Some civilian practitioners have the luxury of having a professional coder code each patient encounter. Professional coders receive specialized training and credentialing in the field of medical coding. Previous studies have shown professional coders tend to code more accurately than physicians (Rogers, 2003; Drish, 2002). According to a study by King, Sharp and Lipsky (2001), family physicians agreed with expert professional coders' CPT codes on only 52% of established patient records. The most common error was undercoding. Undercoding is defined as providing billing codes that are lower than what is documented and lower than what is medically necessary for the beneficiary's medical condition. Many nonphysician employees will undercode for fear of the penalties for upcoding. Furthermore, the family physicians agreed with the expert coders only 17%



of the time for new patient notes, the predominant error being overcoding. Overcoding can have dire consequences if audited by CMS. King et al. reported only 37% of physicians received any CPT coding training after completing their residency. A study conducted by As-Sanie et al. (2005) determined that only 29% of surveyed obstetrics and gynecology residents were confident in coding problem-oriented visits. The researchers also reported a majority of emergency medicine residents rated their confidence in their ability to accurately code as "minimal" (26%) or "not at all" (42%) (As-Sanie et al., 2005). A study by Patel, Bohmer, Barbour and Fried (2005) determined coding compliance training as the topic most neglected in the otolaryngology residency programs. Of the 220 respondents, 142 (64.5%) made coding compliance, by far, the topic most neglected during residency (Patel et al., 2005).

The MHS does not have the resources to employ enough coders to have a one-to-one ratio of coder to physician. The MHS, for the most part, uses a strategy of employing professional coders as "coding coaches" and auditors. The Madigan Army Medical Center (MAMC) coder receives 480 hours of intensive on-site coding training (MAMC Coding SOP, 2006). MAMC coders must attain professional coding credentials to be promoted to the full rating level of GS-0675-08 (Medical Records Technician). MAMC coders have the following performance priorities: (1) Code and audit all encounters with third party insurance; (2) Train, audit and provide feedback to clinical providers, nurses and medical technicians; (3) Audit all other non-billable items with time remaining.

#### *Coding Compliance*

Coding compliance programs have been established in medical facilities, whether a hospital or physician practice, to prevent the submission of erroneous claims and to



identify fraudulent conduct. The Office of Inspector General (OIG), Department of Health and Human Services (HHS) has established key components of effective compliance programs (OIG, 2000):

- (1) Conducting internal monitoring and auditing;
- (2) Implementing compliance and practice standards;
- (3) Designating a compliance officer or contact;
- (4) Conducting appropriate training and education;
- (5) Responding appropriately to detected offenses and developing corrective action;
- (6) Developing open lines of communication; and
- (7) Enforcing disciplinary standards through well-publicized guidelines.

The intent of the compliance plan is to ensure the CPT and ICD-9-CM codes reported on the health insurance claims form are supported by documentation in the medical record (OIG, 2000). According to the CMS, insufficient documentation to support services billed is the number one most common coding/billing errors in 2003 and 2004 (Linker, 2005). Proper documentation should lead to proper coding, thus avoiding a pitfall of “undercoding” medical records in an effort to avoid OIG audits. Continuous undercoding of services can cause physicians to miss out on legitimate revenue.

DoD Directive 6040.41, dated April 13, 2004 and signed by former Deputy Secretary of Defense Paul Wolfowitz, calls for outpatient and inpatient coding compliance plans for all MTFs. Recent studies examining coding compliance programs have found implementation increased provider coding accuracy, potentially increasing revenues while reducing the institutional risk of an OIG audit (Tudela, 2004; Miller &

Getsey, 2001). Stavelly (2000) recommends quarterly 10% audits of provider or coders' charts. Audit results should be tied to performance standards required for employment. For example, a provider or coder must achieve an accuracy rating of 93 percent in order to remain employed (Stavelly, 2000). MAMC coding compliance supports our beneficiaries, avoids CMS or OIG audits, and promotes financial reimbursement for services rendered.

### *Coding Improvement Success Stories*

There have been many recent studies conducted in an attempt to improve coding accuracy and documentation. The private sector realizes the potential risks from a revenue and audit perspective. According to the Accreditation Council for Graduate Medical Education, residents should be knowledgeable about coding, reimbursement, and the management of a medical practice (As-Sanie et al., 2005). As-Sanie et al. (2005) conducted a coding study at the University of North Carolina Department of Obstetrics and Gynecology. Residents were asked to volunteer for four individual coding instruction sessions over six weeks. After the educational intervention, the residents demonstrated an improvement in coding accuracy for E/M codes and a reduction in undercoding errors (As-Sanie et al., 2005).

A study by Patel et al. (2005) introduces the idea of implementing a business-of-medicine (BOM) curriculum in physician residency programs. Seventy five percent of graduates rated their BOM training as poor or fair. Only 20% of graduates responded to having a BOM course during residency training. Graduates reported that coding compliance was the topic most neglected in their residency. Based on this study, it is clear there needs to be an improvement in BOM course work in the physician residency



programs in the United States. A study by Williford, Ling, Summitt and Stovall (1999) also made a salient argument for improved business education within physician residency programs. According to Williford et al., "most physicians received their business education through trial and error, and some never understand the business of their practice" (p. 476). In a speech at the Association of the United States Army (AUSA) Medical Symposium in June 2006, Lieutenant General Kevin C. Kiley, former Army Surgeon General, said that business transformation will lead to better care for Soldiers and their families. Lieutenant General Kiley also discussed the importance of accurate coding with the introduction of the PBAM. The former Army Surgeon General wanted to prove that Army medicine performs better and is a greater value for Soldiers compared to private sector care (Kiley, 2006). Modern medicine practice requires providers to be able to manage their practice using sound BOM skills, in addition to the science and art of medicine.

Rose et al. (2000) conducted a study that implemented a curriculum that covered topics in coding theory, coding audits, team building, effective meetings and structured problem solving. Family physicians' error rates dropped by 20% after implementing the curriculum. Overcoding was reduced by 33%, while undercoding was reduced by 50% (Rose et al., 2000). The authors felt that in addition to the coding education, developing working teams may have led to improved business practices within their clinics.

From the military medicine perspective, Tudela (2004) posits that a provider incentive program and a coding compliance plan lead to improved coding accuracy in the military medical center. The provider incentive program "rewarded" departments with



increased funding for their efforts to improve coding and documentation. Implementation of the coding compliance plan resulted in the desired end state – improved accuracy.

*The Performance Based Adjustment Model (PBAM)*

The Performance Based Adjustment Model (PBAM) is a significant shift from current Medical Command (MEDCOM) budgeting practices and was implemented on October 1, 2006. The PBAM is an attempt to align military medicine with our private sector counterparts in the methods of financial reimbursement (revenue) for medical services rendered. This model was developed in response to rising facility and TRICARE costs coupled with decreasing facility workload and poor data quality (Tucker, 2006). Adjustments will be made to initial budgets based on workload accountability (proper coding for revenue) and for achieving certain Health Plan Employer Data and Information Set (HEDIS) goals. There are also miscoding penalties and reimbursed workload adjustments. Outpatient relative value unit (RVU) goals have been established at 85% of Medical Group Management Association (MGMA) values. Earned revenue, derived from RVUs, is then compared to expected revenue based on submitted available provider time stored in the Uniform Chart of Accounts Personnel Utilization System (UCAPERS). Rates are based on PPS Rates adjusted for percent of military personnel available to total available time by MTF at the product line. Financial deductions will be assessed if the actual workload does not meet the expected level. MTFs will be penalized for inflating revenues due to miscoding. This provides an incentive to MTFs to ensure coding compliance within their facilities.

*Purpose*

The purpose of this study is to determine if the Coding and Workload Accounting Improvement (CWAI) initiative improves coding accuracy and compliance by providers in the Obstetric and Gynecology Clinics and Surgery Clinics. The Obstetric and Gynecology Clinics included eight clinics, including the Breast Cancer Clinic:

## Obstetrics Clinics

1. Obstetrics
2. Antenatal Diagnostic Center  
(ADC Clinic)
3. Maternal Labor and Delivery  
(MLD)

## Gynecology Clinics

1. Gynecology
2. Urology-Gynecology
3. Gynecology/Oncology Genetics
4. Infertility

The Surgery Clinics consisted of ten clinics:

- |                           |                      |
|---------------------------|----------------------|
| 1. General Surgery        | 6. Plastic Surgery   |
| 2. Colorectal Surgery     | 7. Urology           |
| 3. Pediatric Surgery      | 8. Limb Preservation |
| 4. Cardiothoracic Surgery | 9. Vascular Surgery  |
| 5. Neurosurgery           | 10. Wound Care       |

The CWAI intent is to improve clinical workflow and business processes, nurse and medical technician workload documentation, and provider coding accuracy and education.

*Hypotheses*

$H_{a1}$ : The Coding and Workload Accounting Improvement (CWAI) initiative improves coding accuracy by providers in the Obstetric and Gynecology and Surgery Clinics.

$H_{o1}$ : The Coding and Workload Accounting Improvement (CWAI) initiative has no impact on coding accuracy by providers in the Obstetric and Gynecology and Surgery Clinics.

$H_{a2}$ : The Coding and Workload Accounting Improvement (CWAI) initiative improves coding compliance by providers in the Obstetric and Gynecology and Surgery Clinics.

$H_{o2}$ : The Coding and Workload Accounting Improvement (CWAI) initiative has no impact on coding compliance by providers in the Obstetric and Gynecology and Surgery Clinics.

$H_{a3}$ : The Coding and Workload Accounting Improvement (CWAI) initiative increases provider productivity (RVU per encounter) in the Obstetric and Gynecology and Surgery Clinics.

$H_{o3}$ : The Coding and Workload Accounting Improvement (CWAI) initiative has no impact on provider productivity (RVU per encounter) in the Obstetric and Gynecology and Surgery Clinics.

$H_{a4}$ : The Coding and Workload Accounting Improvement (CWAI) initiative increases AHLTA usage in the Obstetric and Gynecology and Surgery Clinics.

$H_{o4}$ : The Coding and Workload Accounting Improvement (CWAI) initiative has no impact on AHLTA usage in the Obstetric and Gynecology and Surgery Clinics.



*Methods and Procedures*

The design of this study is a retrospective quantitative analysis. The intent of the study is to examine coding accuracy, coding compliance, provider productivity (RVU per encounter), and clinic AHLTA usage both before and after the CWAI initiative. The CWAI takes approximately one week in the clinic. Coding accuracy was measured two months prior to the CWAI (baseline measurement) and again two months after the CWAI (post measurement). Coding accuracy is defined as providers entering the proper E/M, CPT and ICD-9-CM codes for each patient encounter. The MEDCOM goal for accurate coding is 100%. Coding accuracy was measured by examining the baseline audit results from the individual clinics compared to the post CWAI audit results from the individual clinics. In addition to audit data from the clinic level, audit data were also gathered for individual providers, pre and post-CWAI. Assessing the pass rate for the individual providers may provide the best indicator of whether the CWAI had an effect on the individual providers. An encounter passes the audit only if all E/M, CPT and ICD-9-CM codes are properly assigned. Thus the data were dichotomous (pass, fail) in the categories "before and after" the CWAI.

Coding compliance was measured by examining the percentage of appointment-inferred (errors or not complete within 72 working hours) Standard Ambulatory Data Records (SADR). The SADR is the database containing all patient encounters and is in compliance with the Health Insurance Portability and Accountability Act (HIPAA) of 1996. Coding compliance is defined as providers completing each encounter within 72 working hours with the proper coding in order for the encounter to process in AHLTA.

For example, if a patient encounter record is missing required information or the CPT code is not linked to a listed ICD-9-CM code, the encounter is listed as “non-compliant,” or inferred. The current MEDCOM standard for compliance is 97% of encounters submitted within 72 working hours. Coding compliance was measured two months prior to the CWAI (baseline measurement) and two months after the CWAI (post measurement). Coding compliance was measured by the appointment-inferred SADR as a total number and percentage of the total SADR (encounters) by product line and clinic. The data were dichotomous (inferred or cleared) in the categories “before and after” the CWAI.

Provider productivity was measured by assessing the RVU values for each individual clinic encounter, then totaling the encounters and averaging the RVU value per encounter. The data were collection from the M2 (MHS Mart) data mart. Provider productivity was measured two months prior to the CWAI (baseline measurement) and two months after the CWAI (post measurement). RVU values were examined using descriptive statistics to examine whether the CWAI had an impact on provider productivity.

AHLTA usage was measured for each clinic by examining the number of encounters originating from clinic providers using either the legacy EMR, the Composite Health Care System (CHCS), or the AHLTA EMR. Part of the intent of the CWAI is to educate and facilitate AHLTA ease of use. The data were collected by MAMC informatics staff. Clinic providers are required to utilize AHLTA for documenting all outpatient encounters.<sup>1</sup> AHLTA usage was measured two months prior to the CWAI (baseline measurement) and two months after the CWAI (post measurement). AHLTA

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<sup>1</sup> Several clinics have an exception to not use AHLTA due to clinical issues.



usage data were dichotomous (AHLTA or CHCS) in the categories “before and after” the CWAI.

The data were gathered from the MAMC PAD coder audit results, CHCS, AHLTA and M2. The CHCS system was the electronic predecessor to AHLTA and continues to be used for running data queries and reports. The M2 is a data warehouse that provides patient-level data for direct and network (private sector) care, both inpatient and outpatient (LeVee, 2005). M2 enables medical staff to query reports detailing medical care to eligible beneficiaries.

### *Sampling Procedures*

Audit samples for coding accuracy were selected at random by the Patient Administration Division at MAMC. MAMC coders perform at least 50 encounter audits per month. Additionally, all audit results are recorded on standard MAMC audit sheets (Appendix A) and then transposed to Microsoft Excel for analysis. Coding compliance data were analyzed via screening all electronic records in CHCS for each month studied. Coding compliance examined the errors and timeliness of documentation. Provider productivity and AHLTA usage were examined for all encounters documented for each month.

### *Validity and Reliability*

The same analysis techniques were used for the baseline and post measurements for coding accuracy and compliance. Coding accuracy audits were performed by senior (lead) coding specialists utilizing a uniformed checklist to ensure validity. The audits were performed by professionally certified coders with an average coding experience of



eight years ( $SD = 5.42$ ). Coding compliance, provider productivity and AHLTA usage measurements were extracted from the appropriate databases.

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#### *Data Analysis Techniques*

Statistical analysis will be conducted using Statistical Package for the Social Sciences (SPSS) software for the descriptive statistics and Pearson's chi-square test for statistical significance in the results. Statistical significance was established at  $p = 0.01$  level due to the large samples of data available. Pre and post CWAI results will be compared to establish if the CWAI had a difference on the resulting data.

### Results

#### *Coding Accuracy*

Results of the pre-CWAI audit are displayed in Table 1. The OB/GYN clinics had an overall audit pass rate of 10% for the 125 records examined prior to the CWAI. The Gynecology Clinic had the highest pass rate at 14%. CPT and ICD-9 coding were the area least compliant. The surgery clinics had an overall pass rate of 21% for the 119 records examined prior to the CWAI. The Pediatric Surgery Clinic had the highest pass rate at 57%. E/M coding was the least compliant. CPT coding was much stronger in the surgery clinics compared to the OB/GYN clinics.

Table 1

*Clinic Pre-CWAI Audit Results*

| Clinic            | Total<br>Records<br>Reviewed | # Total<br>Possible<br>E/M | E/M<br>Correct | %<br>Compliant | # Total<br>Possible<br>ICD-9 | ICD-9<br>Correct | % Compliant | # Total<br>Possible<br>CPT | CPT<br>Correct | %<br>Compliant | Total Passed<br>Audit | Total<br>Failed<br>Audit | % PASS |
|-------------------|------------------------------|----------------------------|----------------|----------------|------------------------------|------------------|-------------|----------------------------|----------------|----------------|-----------------------|--------------------------|--------|
| OB                | 59                           | 59                         | 44             | 75%            | 148                          | 61               | 41%         | 70                         | 36             | 51%            | 3                     | 56                       | 5%     |
| GYN               | 66                           | 67                         | 35             | 52%            | 143                          | 101              | 71%         | 54                         | 32             | 59%            | 9                     | 57                       | 14%    |
| TOTAL OB/GYN      | 125                          | 126                        | 79             | 63%            | 291                          | 162              | 56%         | 124                        | 68             | 55%            | 12                    | 113                      | 10%    |
| Urology           | 15                           | 15                         | 5              | 33%            | 32                           | 8                | 25%         | 21                         | 13             | 62%            | 1                     | 14                       | 7%     |
| Limb Preservation | 13                           | 13                         | 5              | 38%            | 37                           | 24               | 65%         | 16                         | 15             | 94%            | 2                     | 11                       | 15%    |
| Plastic Surgery   | 15                           | 15                         | 8              | 53%            | 23                           | 16               | 70%         | 16                         | 14             | 88%            | 5                     | 10                       | 33%    |
| Ped Surgery       | 7                            | 7                          | 4              | 57%            | 7                            | 5                | 71%         | 7                          | 7              | 100%           | 4                     | 3                        | 57%    |
| Neuro Surg        | 27                           | 27                         | 17             | 63%            | 40                           | 20               | 50%         | 27                         | 27             | 100%           | 6                     | 21                       | 22%    |
| Vascular Surg     | 20                           | 20                         | 10             | 50%            | 24                           | 20               | 83%         | 20                         | 20             | 100%           | 5                     | 15                       | 25%    |
| General Surg      | 22                           | 22                         | 8              | 36%            | 37                           | 19               | 51%         | 22                         | 17             | 77%            | 2                     | 20                       | 9%     |
| TOTAL Surgery     | 119                          | 119                        | 57             | 48%            | 200                          | 112              | 56%         | 129                        | 113            | 88%            | 25                    | 94                       | 21%    |

Individual provider coding accuracy audit data are displayed in Table 2. The providers examined had to have had at least four patient encounters both pre and post-CWAI in order to be analyzed. Three of the four OB/GYN providers did not pass any of the pre-CWAI audits (0 of 26 encounters). The individual OB/GYN providers examined accounted for 25% of the total OB/GYN clinic encounters (31 of 125 clinic encounters). The surgery providers had a slightly higher pre-CWAI audit results. The surgery providers had an overall pass rate of 29% (15 of 51 encounters passed), however the pass rates range from 0% to 67%. The individual surgery providers examined accounted for 43% of the total surgery clinic encounters (51 of 119 clinic encounters).

Table 2

*Individual Provider Pre-CWAI Audit Results*

|               | Correct | Total | % Correct |
|---------------|---------|-------|-----------|
| OB/GYN        |         |       |           |
| Provider 1    | 0       | 9     | 0%        |
| Provider 2    | 0       | 13    | 0%        |
| Provider 3    | 0       | 4     | 0%        |
| Provider 4    | 1       | 5     | 20%       |
| OB/GYN Total  | 1       | 31    | 3%        |
| Surgery       |         |       |           |
| Provider 1    | 1       | 9     | 11%       |
| Provider 2    | 2       | 4     | 50%       |
| Provider 3    | 3       | 9     | 33%       |
| Provider 4    | 3       | 10    | 30%       |
| Provider 5    | 2       | 8     | 25%       |
| Provider 6    | 4       | 6     | 67%       |
| Provider 7    | 0       | 5     | 0%        |
| Surgery Total | 15      | 51    | 29%       |

The post-CWAI clinic level audit data are displayed in Table 3. The OB/GYN clinics improved 200% from pre to post-CWAI audit data (10% to 30% overall pass). The Obstetrics Clinic and Gynecology Clinics had a near equal pass rate (31% and 29%, respectively). The Obstetrics Clinic had a truly significant improvement from a 5% pass rate pre-CWAI to a 31% pass rate in the post-CWAI assessment. The OB/GYN clinics had a tremendous improvement in E/M and CPT coding. A chi-square test was used to determine whether there was a significant difference between the pass/fail rates pre and post-CWAI. The OB/GYN clinics pre and post-CWAI results were statistically significant,  $\chi^2 (1, N = 250) = 15.87, p < .001$ . The surgery clinics did improve from the pre-CWAI assessment (21% to 26% pass rate), however the improvement was not statistically significant,  $\chi^2 (1, N = 242) = .84, p = 0.36$ . The Urology Clinic had the highest individual clinic improvement from 7% pass rate pre-CWAI to a 40% pass rate



post-CWAI. This is in large part due to the Urology Clinic drastically improving their ICD-9 and CPT coding.

Table 3

*Clinic Post-CWAI Audit Results*

| Clinic               | Total<br>Records<br>Reviewed | # Total<br>Possible<br>E/M | E/M<br>Correct | %<br>Compliant | # Total<br>Possible<br>ICD-9 | ICD-9<br>Correct | % Compliant | # Total<br>Possible<br>CPT | CPT<br>Correct | %<br>Compliant | Total Passed<br>Audit | Total<br>Failed<br>Audit | % PASS     |
|----------------------|------------------------------|----------------------------|----------------|----------------|------------------------------|------------------|-------------|----------------------------|----------------|----------------|-----------------------|--------------------------|------------|
| OB                   | 59                           | 59                         | 54             | 92%            | 134                          | 74               | 55%         | 68                         | 55             | 81%            | 18                    | 41                       | 31%        |
| GYN                  | 66                           | 66                         | 51             | 77%            | 141                          | 104              | 74%         | 66                         | 46             | 70%            | 19                    | 47                       | 29%        |
| <b>TOTAL OB/GYN</b>  | <b>125</b>                   | <b>125</b>                 | <b>105</b>     | <b>84%</b>     | <b>275</b>                   | <b>178</b>       | <b>65%</b>  | <b>134</b>                 | <b>101</b>     | <b>75%</b>     | <b>37</b>             | <b>88</b>                | <b>30%</b> |
| Urology              | 15                           | 15                         | 8              | 53%            | 19                           | 18               | 95%         | 22                         | 19             | 86%            | 6                     | 9                        | 40%        |
| Limb Preservation    | 15                           | 15                         | 12             | 80%            | 47                           | 35               | 74%         | 65                         | 60             | 92%            | 5                     | 10                       | 33%        |
| Plastic Surgery      | 18                           | 18                         | 2              | 11%            | 32                           | 22               | 69%         | 18                         | 12             | 67%            | 0                     | 18                       | 0%         |
| Ped Surgery          | 2                            | 2                          | 0              | 0%             | 3                            | 1                | 33%         | 2                          | 1              | 50%            | 0                     | 2                        | 0%         |
| Neuro Surg           | 22                           | 22                         | 16             | 73%            | 39                           | 29               | 74%         | 22                         | 20             | 91%            | 11                    | 11                       | 50%        |
| Vascular Surg        | 21                           | 21                         | 8              | 38%            | 27                           | 21               | 78%         | 21                         | 20             | 95%            | 4                     | 17                       | 19%        |
| General Surg         | 19                           | 19                         | 12             | 63%            | 33                           | 24               | 73%         | 19                         | 14             | 74%            | 6                     | 13                       | 32%        |
| CT Surg              | 3                            | 3                          | 2              | 67%            | 7                            | 2                | 29%         | 3                          | 0              | 0%             | 0                     | 3                        | 0%         |
| Colorectal Surg      | 8                            | 8                          | 1              | 13%            | 12                           | 4                | 33%         | 8                          | 6              | 75%            | 0                     | 8                        | 0%         |
| <b>TOTAL Surgery</b> | <b>123</b>                   | <b>123</b>                 | <b>63</b>      | <b>51%</b>     | <b>219</b>                   | <b>156</b>       | <b>71%</b>  | <b>180</b>                 | <b>152</b>     | <b>84%</b>     | <b>32</b>             | <b>91</b>                | <b>26%</b> |

The post-CWAI individual audit results are displayed in Table 4. OB/GYN providers improved overall from 3% to 17% pass rate, however one provider (Provider 2) still could not pass the audit process (0 for 17 encounters pre and post-CWAI). Reasons for the audit failures mirror the overall clinic reasons – ICD-9 and CPT coding. The individual OB/GYN providers accounted for 18% of the overall post-CWAI clinic level encounters (23 of 125 encounters). The surgery providers had an overall decrease in their audit pass rate (29% to 20%). While two providers increased their audit pass rate (Providers 1 & 7), the remaining five providers actually decreased their audit pass rates. The individual surgery providers accounted for 48% of the overall post-CWAI surgery clinic encounters (59 of 123 encounters).

Table 4

*Individual Provider Post-CWAI Audit Results*

|               | Correct | Total | % Correct |
|---------------|---------|-------|-----------|
| OB/GYN        |         |       |           |
| Provider 1    | 2       | 8     | 25%       |
| Provider 2    | 0       | 4     | 0%        |
| Provider 3    | 1       | 5     | 20%       |
| Provider 4    | 1       | 6     | 17%       |
| OB/GYN Total  | 4       | 23    | 17%       |
| Surgery       |         |       |           |
| Provider 1    | 2       | 7     | 29%       |
| Provider 2    | 2       | 6     | 33%       |
| Provider 3    | 0       | 8     | 0%        |
| Provider 4    | 0       | 10    | 0%        |
| Provider 5    | 3       | 13    | 23%       |
| Provider 6    | 1       | 7     | 14%       |
| Provider 7    | 4       | 8     | 50%       |
| Surgery Total | 12      | 59    | 20%       |

*Coding Compliance*

The number of cleared versus inferred clinic encounters was analyzed in each individual clinic for the OB/GYN and surgery clinics (Tables 5-8). In order to provide the best resolution to the specific clinics, the overall "OB/GYN" and "surgery" were broken down into subcategories. The OB/GYN clinics were separated into five subcategories: The OB Clinic, Other OB (ADC and MLD Clinics), GYN Clinic, Other GYN (URO-GYN, GYN/ONC Genetics, and Infertility Clinics), and the Breast Cancer Clinic. The surgery clinics were separated into the following three subcategories: General Surgery, Urology, and Other SURG (consists of all remaining surgery clinics). Compliance data from two months prior to the CWAI is in Table 5. The OB/GYN clinics had an overall cleared encounter rate of 87% for their clinics. The individual OB/GYN clinics were rather similar in their compliance rates (no outliers). The surgery clinics had an overall

cleared encounter rate of 88%, however, their clinics ranged from a high of 100% (Urology Clinic) to 71% (General Surgery Clinic).

Table 5

*Pre-CWAI Coding Compliance Data – Two Months Prior*

| Clinic               | Total Records Reviewed | Cleared Encounters | CE % | Inferred Encounters | IE% |
|----------------------|------------------------|--------------------|------|---------------------|-----|
| OB CLINIC            | 2780                   | 2502               | 90%  | 278                 | 9%  |
| OTHER OB             | 1268                   | 1040               | 82%  | 228                 | 18% |
| GYN CLINIC           | 1973                   | 1717               | 87%  | 256                 | 13% |
| OTHER GYN            | 395                    | 344                | 87%  | 51                  | 13% |
| BREAST CANCER CLINIC | 102                    | 89                 | 87%  | 13                  | 13% |
| TOTAL OB/GYN         | 6518                   | 5691               | 87%  | 827                 | 13% |
| GEN SURG             | 727                    | 516                | 71%  | 211                 | 29% |
| UROLOGY              | 733                    | 733                | 100% | 0                   | 0%  |
| OTHER SURG           | 1062                   | 977                | 92%  | 85                  | 8%  |
| TOTAL Surgery        | 2522                   | 2226               | 88%  | 296                 | 12% |

Compliance data from one month prior to the CWAI greatly improved in the OB/GYN clinics (87% to 97% cleared encounters) and was within the MEDCOM established standards (Table 6). The OTHER OB clinics improved from 82% cleared encounters to 98% cleared encounters. The surgery clinics also improved over one month from 88% cleared encounters to 93% cleared encounters.



Table 6

*Pre-CWAI Coding Compliance Data –One Month Prior*

| Clinic               | Total Records | Cleared    | CE % | Inferred   | IE% |
|----------------------|---------------|------------|------|------------|-----|
|                      | Reviewed      | Encounters |      | Encounters |     |
| OB CLINIC            | 2045          | 2025       | 99%  | 20         | 1%  |
| OTHER OB             | 1115          | 1093       | 98%  | 22         | 2%  |
| GYN CLINIC           | 1715          | 1629       | 95%  | 86         | 5%  |
| OTHER GYN            | 318           | 286        | 90%  | 32         | 10% |
| BREAST CANCER CLINIC | 64            | 49         | 76%  | 15         | 24% |
| TOTAL OB/GYN         | 5257          | 5081       | 97%  | 176        | 3%  |
| GEN SURG             | 686           | 563        | 82%  | 123        | 18% |
| UROLOGY              | 845           | 803        | 95%  | 42         | 5%  |
| OTHER SURG           | 1320          | 1294       | 98%  | 26         | 2%  |
| TOTAL Surgery        | 2851          | 2659       | 93%  | 192        | 7%  |

One month post-CWAI compliance data (Table 7) for the OB/GYN clinics actually indicates an overall decrease in cleared encounters, it is mostly due to the 10% inferred encounter rate in the GYN Clinic. The other OB/GYN clinics range from 97% to 99% cleared encounters post-CWAI. The surgery clinics also had a small number of increased inferred encounters one month post-CWAI. OTHER Surgery clinics decreased from 98% to 82% cleared encounters. This was due to a sharp increase in inferred encounters in the Pediatric Surgery Clinic (53% inferred encounters). Removing this outlier results in a 95% cleared encounters for OTHER Surgery clinics.

Table 8 displays the final post-CWAI assessment data. The OB/GYN clinics decreased their cleared encounter rate to 92% overall – the Breast Cancer Clinics achieved 100% cleared encounters, however the OTHER GYN clinics only had a 83% cleared encounter rate. The surgery clinics overall improved two months post-CWAI.

OTHER Surgery clinics improved from 82% to 95% cleared encounters, however the General Surgery Clinic dropped from 88% to 72% cleared encounters.

Table 7

*Post-CWAI Coding Compliance Data –One Month After*

| Clinic               | Total Records Reviewed | Cleared Encounters | CE % | Inferred Encounters | IE% |
|----------------------|------------------------|--------------------|------|---------------------|-----|
| OB CLINIC            | 1874                   | 1837               | 98%  | 37.48               | 2%  |
| OTHER OB             | 988                    | 978                | 99%  | 9.88                | 1%  |
| GYN CLINIC           | 1619                   | 1457               | 90%  | 161.9               | 10% |
| OTHER GYN            | 361                    | 350                | 97%  | 10.83               | 3%  |
| BREAST CANCER CLINIC | 92                     | 90                 | 98%  | 1.84                | 2%  |
| TOTAL OB/GYN         | 4934                   | 4712               | 96%  | 221.93              | 4%  |
| GEN SURG             | 512                    | 451                | 88%  | 61                  | 12% |
| UROLOGY              | 638                    | 581                | 91%  | 57                  | 9%  |
| OTHER SURG           | 1075                   | 882                | 82%  | 194                 | 18% |
| TOTAL Surgery        | 2225                   | 1913               | 86%  | 312                 | 14% |

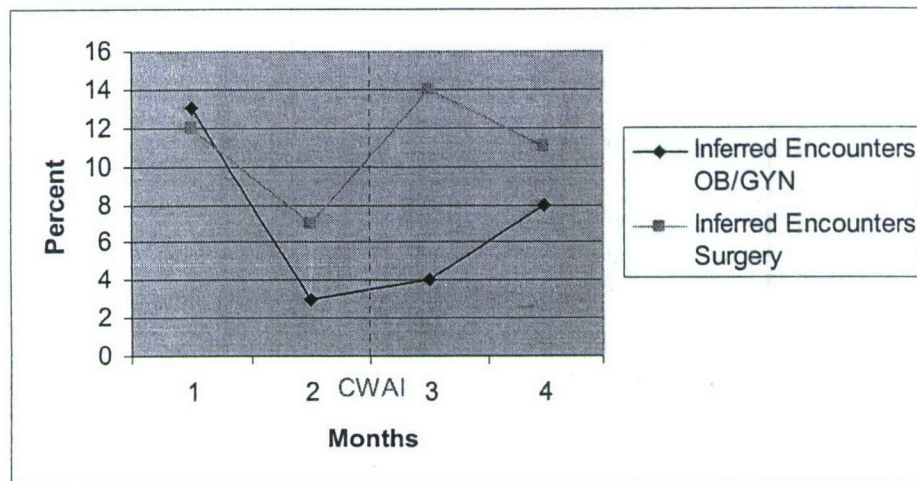
Table 8

*Post-CWAI Coding Compliance Data –Two Months After*

| Clinic               | Total Records Reviewed | Cleared Encounters | CE % | Inferred Encounters | IE% |
|----------------------|------------------------|--------------------|------|---------------------|-----|
| OB CLINIC            | 1934                   | 1837               | 95%  | 97                  | 5%  |
| OTHER OB             | 923                    | 840                | 91%  | 83                  | 9%  |
| GYN CLINIC           | 1530                   | 1377               | 90%  | 153                 | 10% |
| OTHER GYN            | 330                    | 274                | 83%  | 56                  | 17% |
| BREAST CANCER CLINIC | 89                     | 89                 | 100% | 0                   | 0%  |
| TOTAL OB/GYN         | 4806                   | 4417               | 92%  | 389                 | 8%  |
| GEN SURG             | 751                    | 541                | 72%  | 210                 | 28% |
| UROLOGY              | 748                    | 718                | 96%  | 30                  | 4%  |
| OTHER SURG           | 1384                   | 1315               | 95%  | 69                  | 5%  |
| TOTAL Surgery        | 2883                   | 2574               | 89%  | 309                 | 11% |

The clinic pre and post-CWAI compliance data over the course of four months (two before and two after) is depicted in Figure 1. Both the OB/GYN and surgery clinics greatly improved one month prior to the CWAI and then both had increases in the number of inferred encounters for the following months.

Figure 1. Pre and post-CWAI inferred encounters in the clinics.



Combining the two months of the pre-CWAI compliance data and post-CWAI compliance data was done to test for significance in the clinics. A chi-square test was used to determine whether there was a significant difference between the cleared versus inferred encounters before and after the CWAI. The OB/GYN clinics pre and post-CWAI coding compliance results were statistically significant,  $\chi^2(1, N = 21,515) = 38.72, p < .001$ . The surgery clinics, however, actually had a statistically significant decrease in cleared encounters from the pre to post-CWAI assessment,  $\chi^2(1, N = 10,481) = 26.48, p < .001$ .



*Provider Productivity*

The number of patient encounters and the derived average RVU value per encounter were compiled for each of the two months pre and post-CWAI. This before and after data provide the baseline measurements to assess the CWAI impact on clinic productivity. The pre-CWAI numbers of encounters and average RVU values per encounter are displayed in Table 9. After combining the two months, the average number of OB/GYN pre-CWAI encounters was 5888 with an average of 1.07 RVU per encounter. The surgery clinic pre-CWAI encounter average was 2687 encounters with an average of 0.89 RVU per encounter.

Table 9

*Pre-CWAI Provider Productivity*

| Pre-CWAI RVU per Encounter - 2 Months Prior |                            |                           | Pre-CWAI RVU per Encounter - 1 Month Prior |                            |                           |
|---------------------------------------------|----------------------------|---------------------------|--------------------------------------------|----------------------------|---------------------------|
| Clinic                                      | Total Number of Encounters | Average RVU per Encounter | Clinic                                     | Total Number of Encounters | Average RVU per Encounter |
| OB/GYN Clinics                              | 6518                       | 1.05                      | OB/GYN Clinics                             | 5257                       | 1.09                      |
| Surgery Clinics                             | 2522                       | 0.83                      | Surgery Clinics                            | 2851                       | 0.95                      |

The post-CWAI encounters and average RVU values per encounter are depicted in Table 10. The average RVU per encounter increased for both the OB/GYN clinics and surgery clinics. The OB/GYN clinics went from a pre-CWAI low of 1.05 average RVU per encounter to a post-CWAI high of 1.11 average RVU per encounter. Similarly, the surgery clinics went from a pre-CWAI low of 0.85 average RVU per encounter to a post-CWAI high of 1.05 average RVU per encounter. After combining the post-CWAI two months, the average number of OB/GYN post-CWAI encounters was 4867 with an

average of 1.10 RVU per encounter. The surgery clinic post-CWAI encounter average was 2553 encounters with an average of 1.01 RVU per encounter.

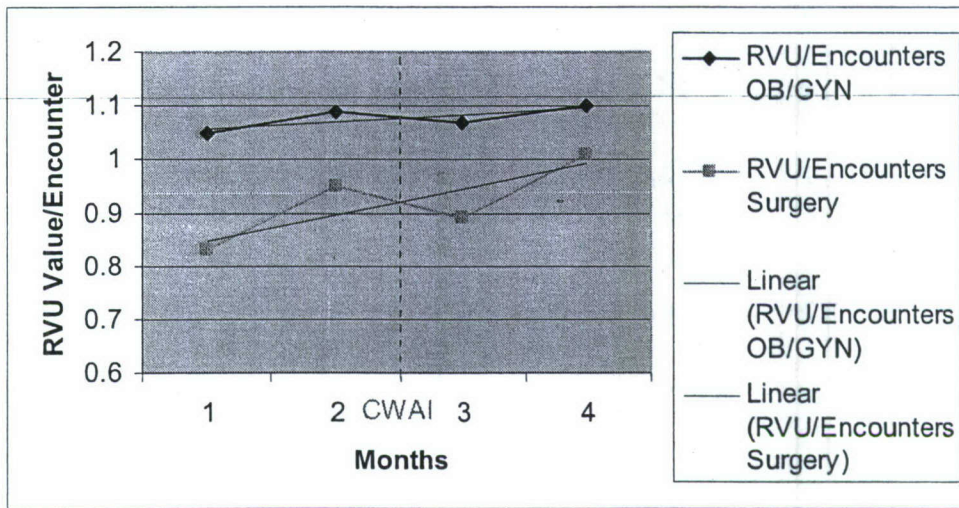
Table 10

*Post-CWAI Provider Productivity*

| Post-CWAI RVU per Encounter - 1 Month After |                            |                           | Post-CWAI RVU per Encounter - 2 Months After |                            |                           |
|---------------------------------------------|----------------------------|---------------------------|----------------------------------------------|----------------------------|---------------------------|
| Clinic                                      | Total Number of Encounters | Average RVU per Encounter | Clinic                                       | Total Number of Encounters | Average RVU per Encounter |
| OB/GYN Clinics                              | 4930                       | 1.11                      | OB/GYN Clinics                               | 4804                       | 1.09                      |
| Surgery Clinics                             | 2225                       | 0.97                      | Surgery Clinics                              | 2880                       | 1.05                      |

Comparing the clinic pre-CWAI averages to the post-CWAI averages, the OB/GYN achieved a 3% increase in productivity. This is clinically significant as this was a minimum goal desired by MAMC leadership. The surgery clinics achieved a 12% increase in productivity. This is very clinically significant as this increase exceeded CWAI expectations. These increases can be tied to increased clinic revenue. A graphical representation of the average RVU per encounter over the two months before and after the CWAI can be seen in Figure 2.

Figure 2. Pre and post-CWAI provider productivity in the clinics.



#### *Clinic AHLTA Usage*

AHLTA usage was compiled for the two months before and after the CWAI.

Table 11 contains the pre-CWAI data. The clinics were grouped in the same manner as the coding compliance data. The OB/GYN MLD Clinic and surgery Cardiothoracic Surgery Clinic were not included in this data due to the fact that they have an exemption from using AHLTA. Prior to the CWAI, the OB/GYN AHLTA usage dropped from the first to second month, mostly due to a drop in the OTHER GYN clinics (70% usage to 58%). The surgery clinics increased their AHLTA usage over the two months prior to the CWAI. Urology increased their AHLTA usage from 50% to 90% over one month time.

Post-CWAI AHLTA usage (Table 12) improved from the pre-CWAI levels. The OB/GYN clinics improved to 86% and 84% AHLTA usage post-CWAI, although the OTHER OB clinics only achieved 33% and 23% over the two post-CWAI measurements. The surgery clinics had an overall AHLTA usage rate of 95% and 98% the two months after the CWAI. This is a remarkable improvement from the first month measured (63%).



Table 11

*Pre-CWAI Clinic AHLTA Usage*

| Pre-CWAI AHLTA Usage - 2 Months Prior |              |               |             |               | Pre-CWAI AHLTA Usage - 1 Month Prior |              |               |             |               |
|---------------------------------------|--------------|---------------|-------------|---------------|--------------------------------------|--------------|---------------|-------------|---------------|
| Clinic                                | CHCS Entries | AHLTA Entries | Grand Total | % Total AHLTA | Clinic                               | CHCS Entries | AHLTA Entries | Grand Total | % Total AHLTA |
| OB CLINIC                             | 789          | 1956          | 2745        | 71%           | OB CLINIC                            | 659          | 1353          | 2012        | 67%           |
| OTHER OB                              | 477          | 148           | 625         | 24%           | OTHER OB                             | 431          | 128           | 559         | 23%           |
| GYN CLINIC                            | 423          | 1505          | 1928        | 78%           | GYN CLINIC                           | 711          | 969           | 1680        | 58%           |
| OTHER GYN                             | 46           | 346           | 392         | 88%           | OTHER GYN                            | 159          | 158           | 317         | 50%           |
| BREAST CANCER CLINIC                  | 2            | 98            | 100         | 98%           | BREAST CANCER CLINIC                 | 4            | 58            | 62          | 94%           |
| TOTAL OB/GYN                          | 1737         | 4053          | 5790        | 70%           | TOTAL OB/GYN                         | 1964         | 2666          | 4630        | 58%           |
| GEN SURG                              | 176          | 431           | 607         | 71%           | GEN SURG                             | 103          | 583           | 686         | 85%           |
| UROLOGY                               | 361          | 368           | 729         | 50%           | UROLOGY                              | 81           | 764           | 845         | 90%           |
| OTHER SURG                            | 301          | 651           | 952         | 68%           | OTHER SURG                           | 133          | 1208          | 1341        | 90%           |
| TOTAL SURGERY                         | 838          | 1450          | 2288        | 63%           | TOTAL SURGERY                        | 317          | 2555          | 2872        | 89%           |

Table 12

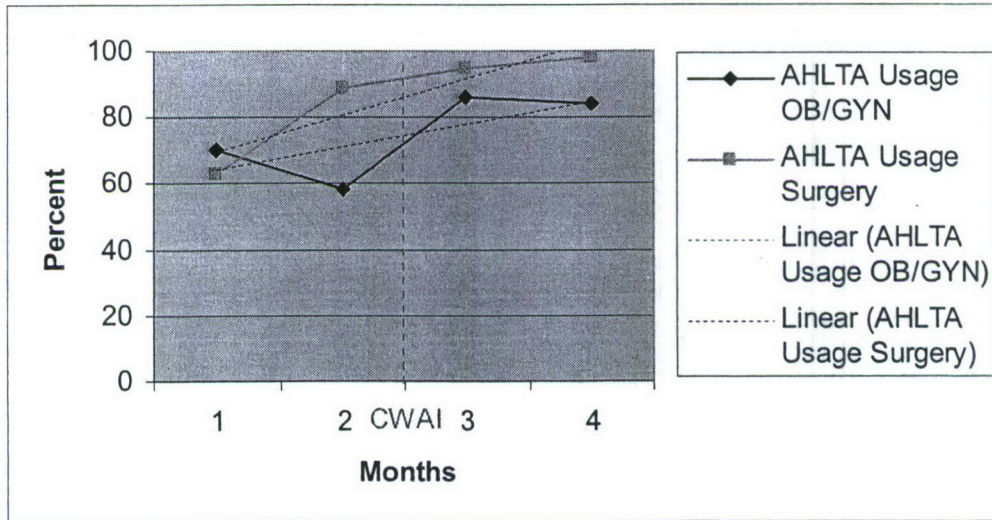
*Post-CWAI Clinic AHLTA Usage*

| Post-CWAI AHLTA Usage - 1 Month After |              |               |             |               | Post-CWAI AHLTA Usage - 2 Months After |              |               |             |               |
|---------------------------------------|--------------|---------------|-------------|---------------|----------------------------------------|--------------|---------------|-------------|---------------|
| Clinic                                | CHCS Entries | AHLTA Entries | Grand Total | % Total AHLTA | Clinic                                 | CHCS Entries | AHLTA Entries | Grand Total | % Total AHLTA |
| OB CLINIC                             | 115          | 1640          | 1755        | 93%           | OB CLINIC                              | 157          | 1612          | 1769        | 91%           |
| OTHER OB                              | 290          | 144           | 434         | 33%           | OTHER OB                               | 289          | 87            | 376         | 23%           |
| GYN CLINIC                            | 114          | 1279          | 1393        | 92%           | GYN CLINIC                             | 156          | 1158          | 1314        | 88%           |
| OTHER GYN                             | 27           | 326           | 353         | 92%           | OTHER GYN                              | 22           | 287           | 309         | 93%           |
| BREAST CANCER CLINIC                  | 0            | 63            | 63          | 100%          | BREAST CANCER CLINIC                   | 0            | 77            | 77          | 100%          |
| TOTAL OB/GYN                          | 546          | 3452          | 3998        | 86%           | TOTAL OB/GYN                           | 624          | 3221          | 3845        | 84%           |
| GEN SURG                              | 31           | 480           | 511         | 94%           | GEN SURG                               | 27           | 724           | 751         | 96%           |
| UROLOGY                               | 29           | 609           | 638         | 95%           | UROLOGY                                | 22           | 726           | 748         | 97%           |
| OTHER SURG                            | 54           | 917           | 971         | 94%           | OTHER SURG                             | 14           | 1359          | 1373        | 99%           |
| TOTAL SURGERY                         | 114          | 2006          | 2120        | 95%           | TOTAL SURGERY                          | 63           | 2809          | 2872        | 98%           |

A chi-square test was used to determine whether there was a significant difference between the AHLTA versus CHCS entries before and after the CWAI. The OB/GYN clinics pre and post-CWAI AHLTA usage results were statistically significant,  $\chi^2 (1, N = 18,263) = 970.99, p < .001$ . The surgery clinics had a similar result using a chi-square test. The surgery clinics pre and post-CWAI AHLTA usage results were statistically

significant,  $\chi^2(1, N = 10,152) = 789.91, p < .001$ . Figure 3 displays the AHLTA usage data over the two months before and two months after the CWAI.

Figure 3. Pre and post-CWAI clinic AHLTA usage.



### Discussion

The results of this study have answered the questions posed in the statement of the problem. First, provider coding accuracy improvement in the OB/GYN clinics was found to have been statistically significant. The surgery clinics coding accuracy also improved, but were not found to be statistically significant. The CWAI may have inspired the clinic providers to improve their clinical documentation and, therefore, the coding auditors agreed with the providers' final code assignment. Prior to the CWAI, the provider may have actually done all procedures, for example, but possibly did not properly document the procedure (CPT code). However, when the coding auditor looks for the documentation to back up the code, they may not find it in the clinical note and would fail the encounter in the audit due to a lack of proper documentation.



The coding compliance data varied between the OB/GYN and surgery clinics.

The OB/GYN clinics had a statistically significant improvement in their coding compliance rates – their rate of inferred encounters dropped dramatically. In addition, a month prior to the CWAI, the OB/GYN clinics also corrected 10,609 inferred encounters that had amassed from many months prior. After applying the PPS rate for OB/GYN (\$74.49) to the average 1.10 RVU per encounter (10,609 encounters), the result is revenue of \$869, 290.85. Cleared encounters result in increased reimbursement. The surgery clinics actually had an increase in inferred encounters after the CWAI. The possible reason for the increase in the inferred encounters derives from the General and Pediatric Surgery Clinics. During the two months after the CWAI (December 2006 and January 2007), several general surgeons and the only pediatric surgeon deployed in support of combat operations. The loss of these key personnel most likely affected the ability to process the encounters in a timely manner.

Increased provider productivity was a byproduct of the improved coding accuracy and compliance. As the providers improved their documentation and it supported assigned higher level codes, the RVU levels increased for the intensity of the workload. Improved compliance allows the encounters to be processed in a timely manner and, thereby, have an RVU value assigned to the work performed.

Increased clinic AHLTA usage was also improved in the OB/GYN and surgery clinics. The improvements proved to be statistically significant. It can be reasoned the CWAI staff provided enough education and awareness to facilitate AHLTA usage for the clinical personnel. Documentation in the EMR is the key to capturing the details of the patient encounter. This documentation in AHLTA facilitates the provider coding



(accuracy) and submission (compliance) and will drive the RVU value assigned to the clinical codes (productivity).

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In addition to these results, the author also wanted to get the providers opinions about outpatient coding. A survey was developed (Appendix B) and given to providers from several specialties ( $n = 43$ ). The mean years of coding was 7.15 years ( $SD = 6.17$ ). The intent of the survey was to get the providers opinions in order to develop where the CWAI or a similar program needed to go next to meet the actual providers' needs. The survey had three main sections: Coding Education; Interaction with AHLTA; and Department (Clinic) Coders. The feedback received mirrors the results of previous literature from Rose et al., Patel et al., and As-Sanie et al dealing with a lack of coding training for providers. The statement *the coding training I received in medical/graduate school was sufficient enough for me to adequately code outpatient encounters* received 98% feedback of *Disagree* or *Totally disagree* (Appendix B). Seventy two percent of respondents said they would like more individual coding training and 63% said they would attend coding training in their departments. A vast majority of the providers (78%) felt that the initial AHLTA training they received was not sufficient for Madigan coding expectations. As for the clinic coders, 67% of respondents said they either *never* or *occasionally* receive help from their clinic coders. However, 64% said they are either *very satisfied* (13%) or *satisfied* (51%) with their clinic coders. The survey questionnaire, respondent demographics and results are in Appendix B.

There have been other benefits from the CWAI that were not measured for this study. For example, the CWAI facilitated a positive relationship and understanding of the clinic coder's role with the clinic staff. In several clinics, a small number of staff were not

correctly profiled in AHLTA and, therefore, could not properly log on to document patient encounters. In some instances the CWAI also helped to increase access to care by making a recommendation to change the proportions and types of appointments being offered to beneficiaries. Third party insurance billing was also increased through the CWAI staff educational effort when examining the patient workflow. Having a multidisciplinary CWAI staff and focus can provide maximum assistance to the outpatient clinics.

### Recommendations

Based on the results, the author recommends sustaining the current CWAI process but with a few additions. The current CWAI does a great job analyzing and assisting the outpatient clinics for an average of one week. However, an additional sustainment program should be established to maintain a high standard of coding excellence. Based on literature and this study's survey, there is a great need to provider level coding education. For the most part in the MHS, we expect our providers to code their own encounters. In many circumstances, the private sector can ignore this lack of provider coding training because they employ a coding staff to code all patient encounters. The MHS cannot afford to ignore the lack of provider coding training. If the MEDCOM is moving to the PBAM for MTF reimbursement, the MTF must more accurately account for their productivity. For example, we can utilize the average pre the and post-CWAI productivity data. If you apply the current PPS service rates to each of the clinic pre and post-CWAI average RVU per encounter, we can see the impact to revenue from increased productivity. The surgery clinic productivity improvement over two months yielded a revenue increase of \$104,656 for every 10,000 patients (done in four months, on average). The OB/GYN clinics saw an increase of \$14,898 for 10,000 patients which, on average, they can do in two months.



The author recommends increasing formal coding education for providers. Coding leadership in conjunction with informatics and Graduate Medical Education leadership should develop a program to fill the coding and AHLTA education void noted in the literature and this study's survey. The majority of providers surveyed welcome the education in order to meet the demands of the facility. In addition to a facility level education program for providers, the author also recommends each department or clinic nominate a provider "coding champion." This coding champion would receive additional training and then "carry the torch" to educate, mentor and assist fellow providers with coding in AHLTA. Having a fellow provider be coding champion will elicit buy-in from other providers. Also, the coding champion could act as a liaison between coding and informatics leadership. MAMC's Department of Family Medicine (DFM) has such a coding champion who regularly teaches not only in his department, but also at national conferences. According to this provider, the DFM has increased their coding accuracy, compliance and productivity due to their educational campaign.

The author also recommends the Army's Patient Activity System and Biostatistics Analysis (PASBA) take a lead role as the central leadership point for the MEDCOM for coding training. As the MEDCOM begins to utilize the PBAM at the corporate level, the MTFs should be provided the resources to best succeed. The author recommends highly trained coding specialists, each with medical specialty focus areas, begin training programs at the MTFs and at annual national provider conferences (i.e. the American College of Obstetrics and Gynecology). Facility coders could attend training for several days and then return to their MTF to better serve in their capacity.

Professional coding certifications and continuing education requirements should also be a part of employment as a clinic coder. Examples of coding certifications are the



American Health Information Management Association (AHIMA) and the CPC. Current MAMC policy requires professional coding certification to be promoted to GS-08, but it is not required for initial employment. In addition to general coding certifications, there are also medical specialties coding credentials. For example, the Radiology Coding Certification Board (RCCB) tests radiology professionals to become radiology certified coders. Providers are expected to hold professional certifications, the nonclinical staff should also be held to a certain level of certification standards. The Office of the Inspector General recommends coder certification in its model compliance plan for physician practices (OIG, 2000). In addition the coding certification, Stavely (2000) recommends auditing roughly 10% of coders' charts for accuracy and then given a percentage (up to 100%). The coder must maintain an accuracy rating of 93%, for example, to remain employed. Each element of the chart would carry a weight – an error resulting in a wrong CPT code would carry more weight than a missed zip code (Stavely, 2000).

In addition to the required coding audits, the clinic coders also need to provide structured feedback to their providers. Several providers surveyed remarked they never receive coding feedback and, therefore, assume they are doing a fine job of coding encounters. In addition to the feedback, clinic coders should also conduct focused shadowing training with providers who may require additional assistance. Clinic coders should also be afforded an opportunity to attend coding training for their specialty (i.e. neurology). Small investments in training can have a huge return on investment.

### Conclusion

The benefits of a great coding program are many. First, proper documentation and coding can keep provider and the MTF out of legal trouble. Individuals and facilities have little chance to stand up to CMS and/or insurance audits if they have not accurately documented their clinical notes. Second, MTFs can expect larger reimbursements and reduced claims rejections if the clinical documentation is properly done. Detailed documentation could lead to more accurate coding which leads to quicker reimbursement. Third, proper coding and documentation allows the facility to monitor the corporate, clinic and provider level productivity. This measurement allows the facility to properly resource and staff based on the data. The final benefit of a good coding program is the ability to monitor the population health in the community served. Proper documentation drives good data. This data can be analyzed to determine what services are required by beneficiaries or if there is a need that requires attention. Proper coding is a good foundation on which to lay medical practice.

## Appendices

### Appendix A. The Audit Review Form

Figure A1. The Audit Review Form

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### Appendix B. Provider Survey and Responses

Figure B1. The Provider Survey – Section One

Figure B2. The Provider Survey – Section Two

Figure B3. The Provider Survey – Section Three

Table B1. Respondent Results

Figure B4. Respondent Results – Section One

Figure B5. Respondent Results – Section Two

Figure B6. Respondent Results – Section Three

Figure B7. Respondent Demographics – Type of Provider

Figure B8. Respondent Demographics – Provider Status



## Appendix A

## The Audit Review Form

Figure A1. The Audit Review Form

| AUDIT REVIEW FORM                          |  |                            |             |            |            |
|--------------------------------------------|--|----------------------------|-------------|------------|------------|
| CLINIC <u>MEPRS</u> _____                  |  | PHYSICIAN _____            |             |            |            |
| DATE OF AUDIT _____                        |  | DATE OF ENCOUNTER _____    |             |            |            |
| ENCOUNTER ID (last name, FMP/Last 4) _____ |  |                            |             |            |            |
| FINDINGS:                                  |  |                            |             |            |            |
| E/M – ADM: _____                           |  | New                        | Established | Consult    | Other      |
| E/M – Documentation: _____                 |  | New                        | Established | Consult    | Other      |
| History= _____                             |  | Exam= _____                |             | MDM= _____ |            |
| ICD-9 – ADM: _____                         |  |                            |             |            |            |
| ICD-9 – Documented: _____                  |  |                            |             |            |            |
| _____                                      |  |                            |             |            |            |
| CPT – ADM: _____                           |  |                            |             |            |            |
| CPT – Documented: _____                    |  |                            |             |            |            |
| _____                                      |  |                            |             |            |            |
| E/M Correct: YES NO → High/Low/Type _____  |  |                            |             |            |            |
| <u>ICD-9</u> Correct: YES NO               |  | <u>CPT</u> Correct: YES NO |             |            |            |
| PATH REPORT: Yes No N/A                    |  | PASS                       |             | FAIL       |            |
| CODER'S CORRECTIVE ACTION: _____           |  |                            |             |            |            |
| _____                                      |  |                            |             |            |            |
| PHYSICIAN / PROVIDER SIGNATURE _____       |  |                            |             |            | Date _____ |
| CODER NAME / SIGNATURE _____               |  |                            |             |            |            |

## Appendix B

## Provider Survey and Responses

Figure B1. The Provider Survey – Section One

|                                                                                                                                                                                                                                                                                                                                                           |           |               |                     |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------|---------------------|-------|
| Thank you for agreeing to take this survey. Your participation is greatly appreciated and will contribute to the success of this study. Please take a few minutes to honestly assess the following questions and statements. Your honest feedback will help me with my graduate thesis and may lead to improvements in the coding system here at Madigan. |           |               |                     |       |
| Are you a:                                                                                                                                                                                                                                                                                                                                                | Physician | NP or Midwife | Physician Assistant |       |
| Are you a/an:                                                                                                                                                                                                                                                                                                                                             | Intern    | Resident      | Fellow              | Staff |
| How many years have you been coding outpatient encounters?                                                                                                                                                                                                                                                                                                |           |               |                     |       |
| <b><u>Coding Education - Please circle your answer</u></b>                                                                                                                                                                                                                                                                                                |           |               |                     |       |
| 1 The coding training I received in medical/graduate school was sufficient enough for me to adequately code outpatient encounters.<br>Totally agree ---- Agree ---- Disagree ---- Totally disagree                                                                                                                                                        |           |               |                     |       |
| 2 My coding training enables me to meet coding standards.<br>Always ---- Most of the time ---- Some of the time ---- Never                                                                                                                                                                                                                                |           |               |                     |       |
| 3 I would like more individual coding training.<br>Totally agree ---- Agree ---- Disagree ---- Totally disagree                                                                                                                                                                                                                                           |           |               |                     |       |
| 4 How likely would you be to attend coding training in your department?<br>Definitely attend ---- Might attend ---- Probably not attend ---- Definitely would not attend                                                                                                                                                                                  |           |               |                     |       |

Figure B2. The Provider Survey – Section Two

| <b><u>Interaction with AHLTA – Please circle your answer</u></b> |                                                                                                                                                        |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                                                | AHLTA helps me to correctly code my patient encounters.<br><br>Always ---- Most of the time ---- Some of the time ---- Never                           |
| 2                                                                | I can easily find relevant coding menus in AHLTA.<br><br>Yes ----- No                                                                                  |
| 3                                                                | The AHLTA user training I received is sufficient for Madigan coding expectations.<br><br>Yes ----- No                                                  |
| 4                                                                | How likely are you to attend AHLTA user training?<br><br>Definitely attend ---- Might attend ---- Probably not attend ---- Definitely would not attend |

Figure B3. The Provider Survey – Section Three

| <b><u>Department Coders – Please circle your answer</u></b> |                                                                                                                                                                                |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                                           | Our department coders assist me with coding issues.<br><br>Never ---- Occasionally ---- Often ---- All the time                                                                |
| 2                                                           | How often do you interact with your department coders?<br><br>Everyday<br>Weekly<br>Every two weeks<br>Monthly<br>Rarely<br>I have never interacted with our department coders |
| 3                                                           | How satisfied are you with your departmental coders?<br><br>Very satisfied ---- Satisfied ---- Dissatisfied ---- Totally dissatisfied                                          |



Table B1

Respondent Results (n = 43)

| Question     | Response                    | Percent |
|--------------|-----------------------------|---------|
| Question 1-1 | Totally agree               | 0       |
|              | Agree                       | 2       |
|              | Disagree                    | 29      |
|              | Totally disagree            | 67      |
| Question 1-2 | Always                      | 22      |
|              | Most of the time            | 22      |
|              | Some of the time            | 44      |
|              | Never                       | 17      |
| Question 1-3 | Totally agree               | 42      |
|              | Agree                       | 49      |
|              | Disagree                    | 9       |
|              | Totally disagree            | 0       |
| Question 1-4 | Definitely attend           | 63      |
|              | Might attend                | 37      |
|              | Probably not attend         | 0       |
|              | Definitely would not attend | 0       |
| Question 2-1 | Always                      | 2       |
|              | Most of the time            | 30      |
|              | Some of the time            | 42      |
|              | Never                       | 26      |
| Question 2-2 | Yes                         | 30      |
|              | No                          | 70      |
| Question 2-3 | Yes                         | 22      |
|              | No                          | 78      |
| Question 2-4 | Definitely attend           | 49      |
|              | Might attend                | 31      |
|              | Probably not attend         | 20      |
|              | Definitely would not attend | 0       |

| Question     | Response                    | Percent |
|--------------|-----------------------------|---------|
| Question 3-1 | Never                       | 13      |
|              | Occasionally                | 54      |
|              | Often                       | 31      |
|              | All the time                | 3       |
| Question 3-2 | Everyday                    | 5       |
|              | Weekly                      | 21      |
|              | Every two weeks             | 3       |
|              | Monthly                     | 26      |
|              | Rarely                      | 41      |
|              | Never interacted with coder | 3       |
| Question 3-3 | Very satisfied              | 13      |
|              | Satisfied                   | 51      |
|              | Dissatisfied                | 28      |
|              | Totally dissatisfied        | 3       |

Figure B4. Respondent Results – Section One

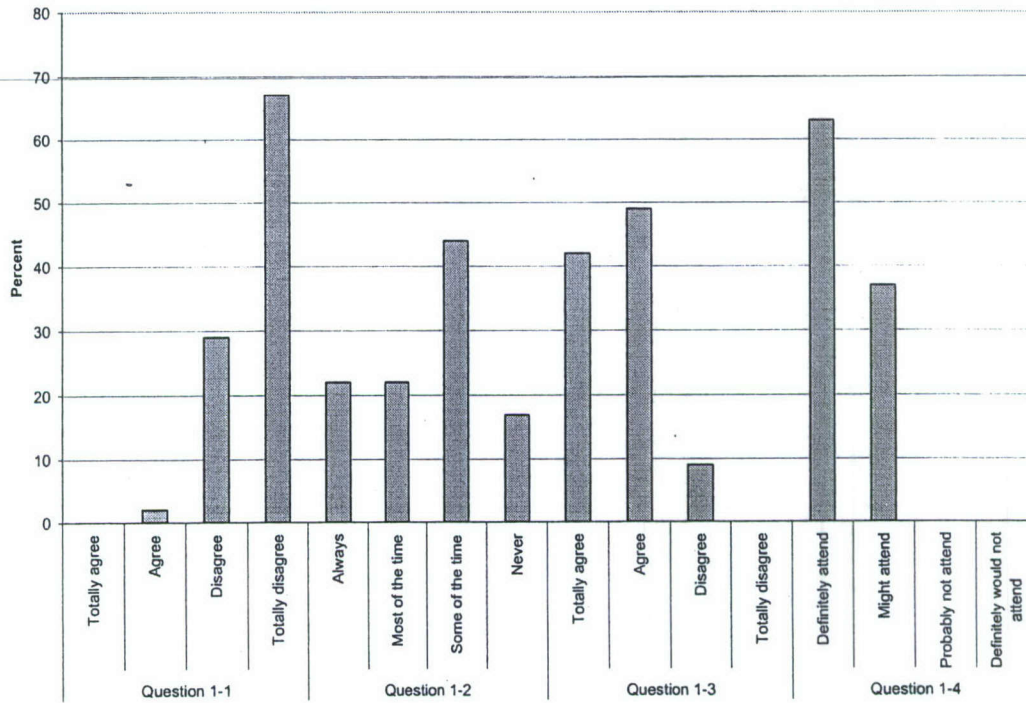


Figure B5. Respondent Results – Section Two

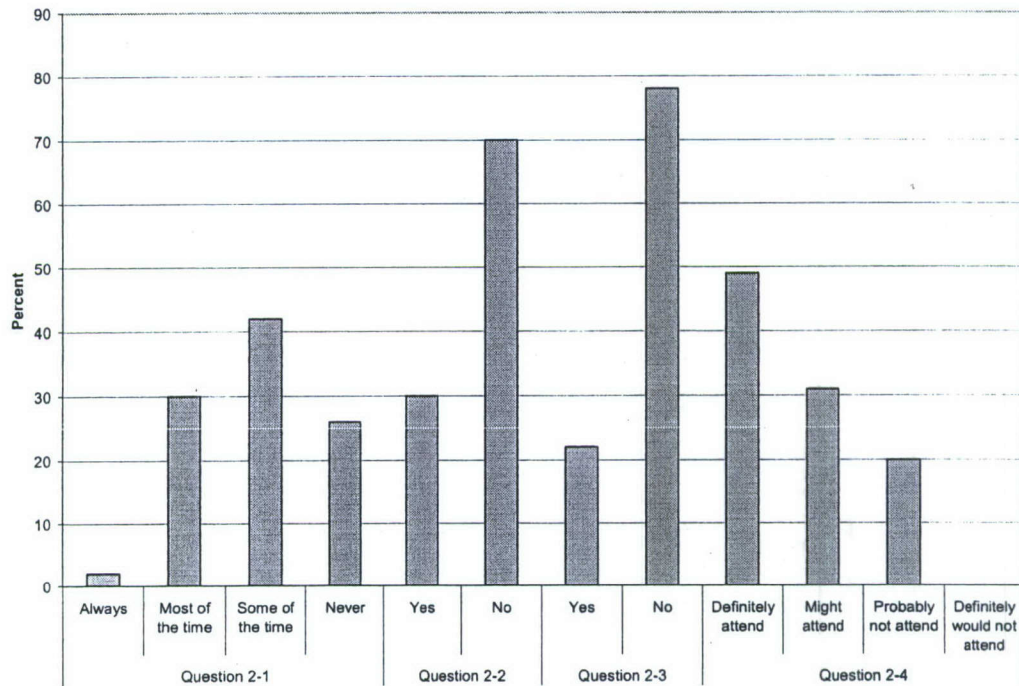


Figure B6. Respondent Results – Section Three

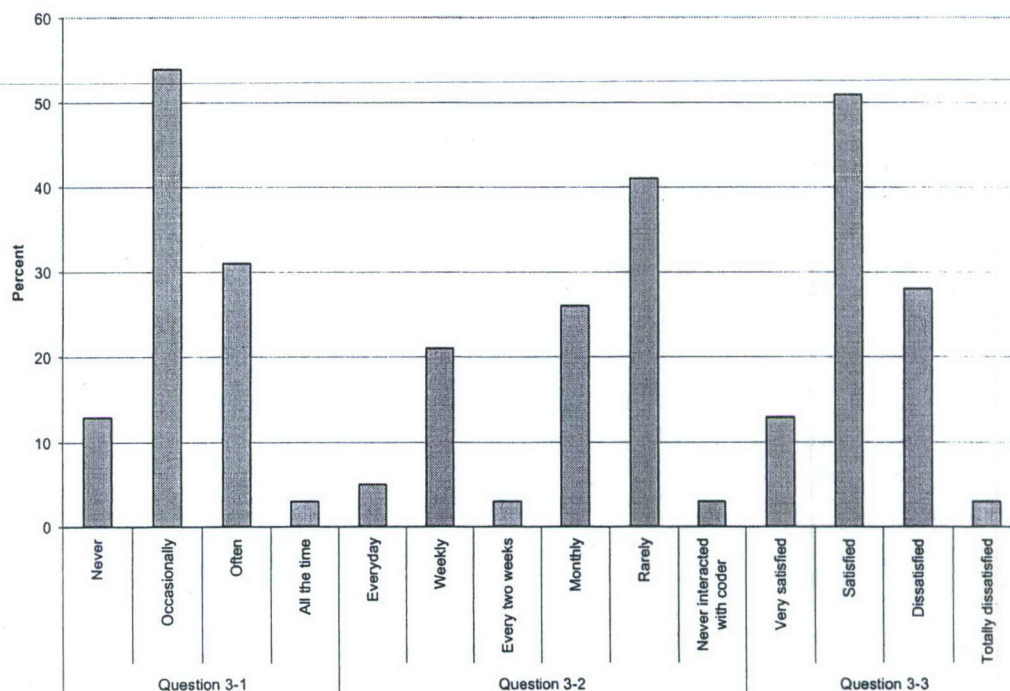


Figure B7. Respondent Demographics – Type of Provider (n = 43)

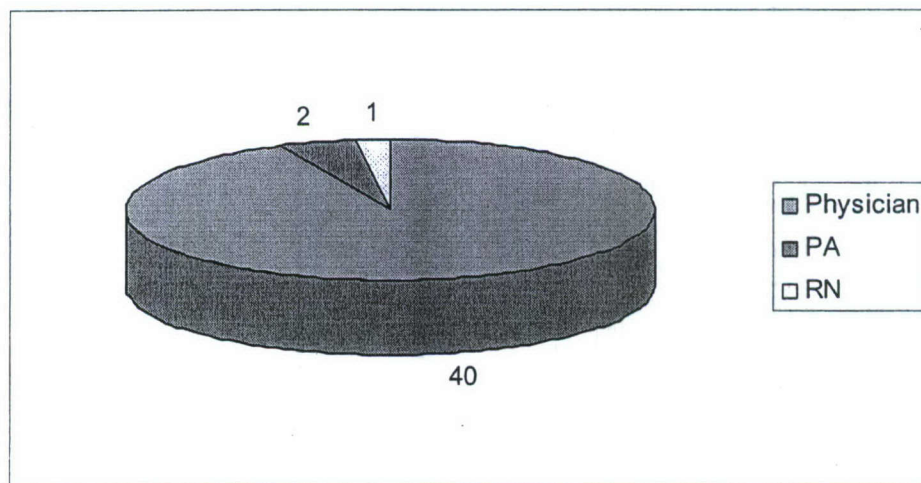
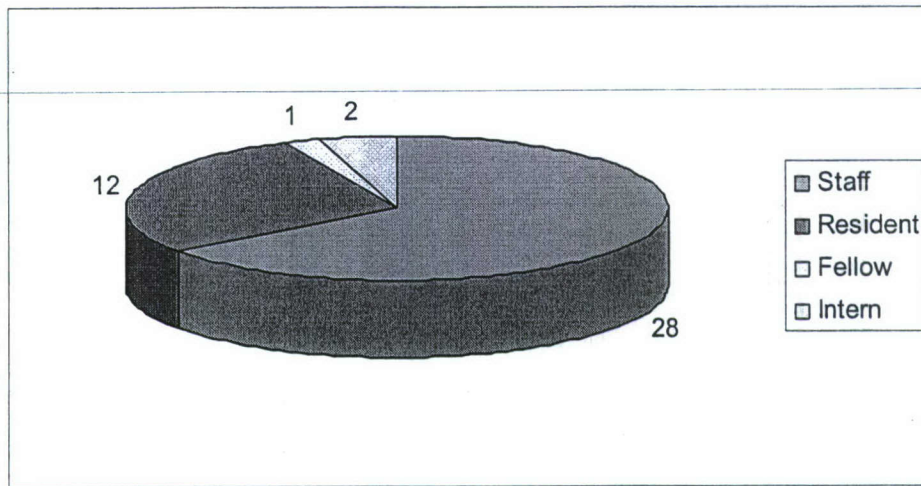




Figure B8. Respondent Demographics – Provider Status (n = 43)



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