# Development of a Comprehensive Clinical Pharmacy Workload Documentation System

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**ABSTRACT**

*The purpose of this project was to develop a workload documentation system which captures the clinical activities of the pharmacist, as well as the pharmacist's impact on the patient's drug therapy outcomes and costs.*

*The documentation system consists of three sections: clinical activities, clinical effectiveness indicators, and cost-effectiveness indicators. In addition to those established by the National Hospital Productivity Improvement Program - Pharmacy Workload Measurement System, other indicators are incorporated to more accurately reflect the pharmacists' daily clinical activities. Clinical effectiveness indicators of patient outcomes include the number and type of drug-related problems identified and resolved and the number of therapeutic interventions made and accepted. Cost-effectiveness is measured by pharmacists' interventions on 14 focused areas of drug therapy. Compliance with daily documentation is facilitated by use of pocket-sized cards for data collection and retrieval.*

*This documentation system has been implemented since December 1990. Quarterly reports submitted to the Director identify changes and trends in workload. Information is used for staff justification, impact assessment of clinical service provided, identification of needs for staff development and planning future clinical directions. In order to enhance the efficiency of documentation and data analysis, future plans include computerization and evaluation of the frequency of data collection.*

**Key Words:** *Clinical Pharmacy, Documentation, Workload*

**RÉSUMÉ**

*Le but de ce projet était d'élaborer un système de documentation de la charge de travail, qui puisse témoigner des activités cliniques de la pharmacie et des conséquences des actes du pharmacien sur les résultats et les coûts thérapeutiques.*

*Le système de documentation comporte trois composantes : les activités cliniques; les indicateurs d'efficacité clinique; et les indicateurs du rapport coût/efficacité. Outre les indicateurs établis dans le cadre du Programme national d'amélioration de la productivité en établissement de santé-le Système de mesure de la charge de travail en pharmacie, d'autres indicateurs ont été ajoutés afin de représenter plus fidèlement les activités cliniques quotidiennes des pharmaciens. Les indicateurs d'efficacité clinique relatifs aux résultats thérapeutiques comprennent le nombre et le type de problèmes associés aux médicaments qui ont été identifiés et résolus, et le nombre d'interventions thérapeutiques exécutées et acceptées. Les indicateurs du rapport coût/efficacité sont obtenus en évaluant les interventions des pharmaciens dans 14 domaines délimités de la pharmacothérapie. La documentation de la charge de travail est facilitée grâce aux fiches format de poche utilisées pour consigner et extraire les données.*

*Ce système de documentation est exploité depuis décembre 1990. Des rapports trimestriels soumis au chef de la pharmacie identifient les changements et les tendances dans la charge de travail. L'information obtenue est utilisée pour justifier les effectifs, évaluer les conséquences des services cliniques fournis, identifier les besoins en dotation de personnel et planifier les orientations cliniques futures. Pour maximiser l'efficacité de la documentation et l'analyse des données, on prévoit informatiser le système et évaluer la fréquence de la cueillette des données.*

**Mots Clés :** *charge de travail, documentation, pharmacie clinique,*

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## INTRODUCTION

All health care professions, pharmacy being no exception, are faced with increasing financial constraints and competition for available resources in the current health care system. Thus, it has become vital for pharmacy to develop a system that will assist in justifying the present level of patient care as well as future expansion. Evidence of productivity and impact on patient outcomes and cost will be essential to continue progress with clinical pharmacy services.[1] As succinctly stated by Cohen,[2] "if it isn't documented, it wasn't done", or by Sawyer and Eckel,[3] "without documentation accountability is lost", departments of pharmacy have been urged to implement documentation programs. A number of different clinical pharmacy documentation programs have been reported in the literature, each with a different focus or purpose. Some have focused on documentation of clinical pharmacists' activities, others on pharmacist's interventions, or on cost containment.[4-8]

In 1987, a clinical pharmacy workload documentation based on the National Hospital Productivity Improvement Program - Pharmacy Workload Measurement System was initiated in our institution.[9] The clinical pharmacy activities captured by this system included medication history, patient counselling, drug therapy monitoring, and pharmacokinetic drug monitoring. It was subsequently revised in 1989 to include the number of drug information requests, the number of therapeutic interventions and their acceptance, inservices and physician/multi-disciplinary rounds. A further revision, implemented in December 1990, attempted to measure the influence of clinical pharmacy services. Specifically, these included drug-related problems (DRPs) and the cost-effectiveness of 14 focused therapeutic interventions (FTI). The following describes this current workload documentation system.

## RATIONALE

In November 1990, a number of factors prompted our department to re-evaluate the clinical pharmacist workload documentation system. Our previous workload system was not able to efficiently and accurately capture all relevant clinical pharmacists' activities, nor provide evidence of the pharmacists' impact on patient care outcomes or financial savings. Due to the growing focus on cost constraints and the need for resource justification, our hospital's administration began to request evidence of staff productivity, the impact of services on patient care and cost-savings. It was recognized that a comprehensive system was required to capture both qualitative and quantitative data regarding pharmacists' clinical activities, as well as their impact on patient outcomes and costs. The assessment of the pharmacists' impact on patient care prior to November 1990 was limited to the number and type of therapeutic interventions and whether they were accepted or rejected. This type of workload data collection is currently in place in many hospital settings. However, none of the commonly collected endpoints, for example, the numbers and types of interventions, their acceptance, or cost-savings, truly reflect the contribution of the pharmacist in effecting positive patient outcomes. In order to capture the pharmacist's true impact on patient care, documentation systems need to include an assessment of the impact on direct patient outcomes.[10]

At the same time, our department was introduced to the concept of Pharmaceutical Care (PC), a philosophy of pharmacy practice as defined by Hepler and Strand.[11] In order to provide PC, pharmacists need to assume more visible responsibilities for patients' outcomes which are related to drug therapy. Patient drug-related needs are determined by identifying actual or potential DRPs. If a patient's needs are met by solving or preventing DRPs, it is believed that a positive contribution is made to the patient's overall health status. Activities involved in the provision of pharmaceutical care need to be documented, collected and, therefore, incorporated into the clinical pharmacy workload documentation system. The measure of a pharmacist's impact on patient outcome should consider more than the acceptance of a recommendation because this does not guarantee that the recommendation is the right one, that the problem is resolved or that it meets the patient's satisfaction. Therefore, the workload data collected should demonstrate if the desired patient outcomes are achieved through the identification of an actual or potential DRP, implementation of a pharmacy intervention, and whether the DRP is resolved or prevented. To our knowledge such a system has not been developed and implemented at this time at any Canadian institution.

In attempting to capture data which reflect pharmacists' impact, many workload systems have focused on or incorporated cost-savings data. These are frequently based on pre-selected drugs and intervention strategies.[7,8] Even though these types of data do not reflect the pharmacists' impact on patients' well-being, they do effect the hospital's financial resources.[7,8] It is still important to incorporate some means of cost-benefit analysis of pharmacists' contribution to patient care. Therefore, some method of quantifying financial saving is considered desirable in a clinical workload documentation system.

The former system at our institution captured only quantitative data and involved the use of three different letter-sized forms which were time consuming to complete and not very portable. Thus, pharmacists' compliance with the system was low and the data collected were not an accurate representation of overall workload. The decision was made to streamline the documentation requirements,

integrate the quantitative data on pharmacists' patient care activities, and include the pharmacist's impact on patient outcomes and drug costs.

## PURPOSE

The primary purpose of the project was to develop a documentation system that captures the clinical activities of pharmacists and their impact on patient care and drug cost savings. The documentation system must:

a) be effective in capturing the pharmacists' clinical workload;
b) incorporate patient-oriented outcomes and cost-savings;
c) be efficient in order to minimize demands on pharmacists' time and enhance compliance;
d) be meaningful to staff, departmental management and hospital administration in order to assist with staff justification;
e) be useful in monitoring staff performance, identifying staff development needs and in planning future clinical directions; and
f) be ongoing in order to provide trends and comparisons.

## DESCRIPTION OF SYSTEM

The existing clinical workload documentation was revised in order to incorporate the requirements listed in the criteria. The data collection is separated into three sections: (a) clinical activities; (b) clinical effectiveness (patient oriented outcomes); and (c) cost savings. The indicators or elements which are to be collected under each section are outlined in Appendix A.

Workload indicators for clinical activities were reassessed and modified. Drug information requests, therapeutic interventions and acceptance, inservices and rounds continue to be documented. In addition, other activities such as number of orders clarified, number of drug distribution issues defined as "trouble shooting" and number of patients monitored were incorporated. In order to measure the pharmacists' impact on patient outcomes, patient-specific DRPs were identified and documented. A DRP is defined as an actual or potential sign or symptom undesirable to the patient and related to drug therapy.[12] Pharmacists have to describe the DRP; for example: "patient has nausea and vomiting secondary to an excessive dose of theophylline which he/she is receiving for asthma". The desired outcome (pharmacotherapeutic endpoint) is then determined and documented for each DRP along with the specific recommendation made, whether it is accepted, and whether the DRP is subsequently resolved or prevented. Pharmacists are provided with a description of the eight DRP categories, and guidelines which describe all the indicators/activities to be collected and documented.

Another important component of the clinical pharmacy workload documentation system is the financial impact of pharmacists' activities. A Focused Therapeutic Intervention (FTI) Program was developed. Nine drugs were selected for 14 focused areas of intervention (Appendix B). Selection was based on high usage, potential for inappropriate prescribing or potential for demonstrable cost-savings. An example of an opportunity for intervention would be a patient who was tolerating oral intake who was inappropriately prescribed intravenous metronidazole instead of oral. Guidelines were developed for each focused intervention with background information, rationale for the suggested alternative, references and cost-saving estimations to assist the pharmacists in their assessments and interventions.

In an attempt to facilitate documentation of the three different sets of data and minimize the time requirement, pocket-sized cards were developed as illustrated in Appendix C. All pharmacists document their activities daily on these workload cards. Each pharmacist is responsible for collating his/her own monthly workload statistics, including assessment of DRP and submits these as a month-end report to the Manager of Clinical Services. A quarterly report is then prepared by the Manager and submitted to the Director of Pharmacy. Summaries of workload data and focused therapeutic intervention assessment are submitted to the hospital's administration and the Pharmacy and Therapeutics Committee, respectively, on an annual basis. These summaries are also used ad hoc to justify programs and services.

Over the initial three-month period, the system was tested by all staff pharmacists. Feedback was requested and compliance with the process was monitored. Suggested modifications were incorporated and the system was finalized.

## EVALUATION OF SYSTEM

The revised clinical workload documentation system provides data that are useful to both the staff and management. A comparison of the information which has been generated with the new and previous systems is summarized in Appendix D.

### Usefulness to Management

Compared to the previous system, a greater number of clinical activities are captured and thus provide a more effective and accurate indication of the pharmacists' clinical workload. Compared to the statistics for the indicators used in the previous system, there was approximately a two-fold increase in number of drug information questions answered and therapeutic interventions made. This suggests increased compliance with documentation, as neither the patient population nor staffing underwent significant changes during the transition year.

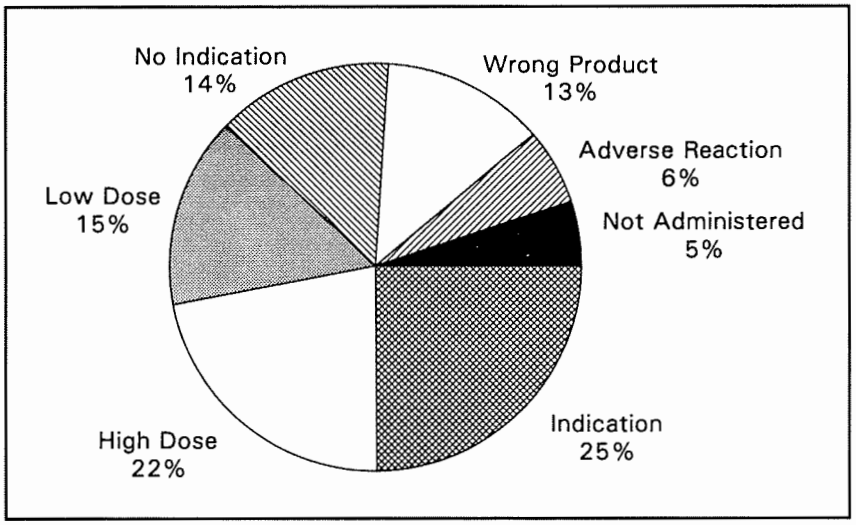
Data are also available which incorporate patient outcomes and illustrate how pharmacists' affect patients

directly by identifying, solving, and preventing patient-specific DRPs. In 1991/92, clinical pharmacists made 5,187 therapeutic interventions; 92% of these interventions were accepted (Appendix Db). More importantly, in the same time frame 3,804 patient-specific DRPs were identified by the pharmacists; 81% of these were resolved or prevented by pharmacists. Furthermore, the data may be categorized according to the nature of the drug-related problems as illustrated in Figure 1.

In times of severe cost constraint, hospital administration is particularly interested in evidence that demonstrates a positive financial impact. Our system is capable of providing selected evidence of cost-benefit. We were able to demonstrate that based on intervention in the use of 14 targeted drugs, $27,915 (drug acquisition and IV administration costs) were saved in 1991-92 (Appendix Dc). The cost-effective ratio of this saving can be determined by dividing the total cost savings associated with the FTI by the total cost of pharmacists' time to perform the FTI. The later cost was based on the total amount of time taken by pharmacists to carry out the FTI activities. This saving represented a cost-effective ratio of 24.

The three types of desired data (patient care activities, patient outcomes, and financial savings) can be effectively integrated into one documentation system. To date, the information has been well received by the Pharmacy and Therapeutics Committee and senior administration. It may have assisted in highlighting clinical pharmacy services, thereby maintaining support in times of significant service cutbacks. Trending workload changes is important in order to demonstrate to administration that the department is able to monitor and adjust staffing as required. This will be increasingly important with hospital downsizing and a changing in-patient population.

**Figure 1: Categories of Drug Related Problems Identified (1990/91)**




**CATEGORIES OF DRUG RELATED PROBLEMS**

| | |
|---|---|
| No Indication | -No indication for which drug is received |
| Indication | -Not receiving a drug for which there is valid indication |
| Wrong Product | -Receiving wrong product (choice, formulation) |
| Low Dose | -Receiving too low dose of appropriate drug |
| High Dose | -Receiving too high dose of appropriate drug |
| Not Administered | -Drug not administered as ordered |
| Adverse Reaction | -Experiencing adverse drug reaction (not dose-related) |
| Drug Interaction | -Experiencing drug interaction |

## Impact on Staff

The data and trends obtained from the documentation system are useful in monitoring staff performance and in providing a measure of the pharmacists' achievement in their annual performance review. Since each staff member has to collate his/her own monthly statistics and submit a month-end report, there is also opportunity for self-assessment. Pharmacists may be able to independently identify from their monthly data, specific areas of weakness in which they may require assistance.

The data also assist in identifying areas for staff development and in planning future clinical directions. For example, pharmacists assess a large number of patients (initial screen), but only select a small proportion of patients for intensive monitoring. At present, patients are selected for intensive monitoring based on the individual pharmacist's own criteria and experience when they suspect that these patients may have or are at risk of developing DRPs. From our data, over 400 DRPs have been identified monthly by our pharmacists. However, this represents on an average only 0.7 DRPs per patient who is intensively monitored. This suggests the need to provide staff with a more structured process for assessing patients and identifying DRPs. This focus has been now incorporated into the department's clinical annual objectives and education program. Similarly, it is expected that the types of DRPs identified will provide a focus for clinical skill training. In addition, the manager of clinical services reviews and reassess individual pharmacist's workload and monitors for compliance. Statistics are used for individual pharmacist's performance management and to identify focus for individual staff development.

## Staff assessment/acceptance

In order to continue to improve the documentation system, a staff survey

was recently conducted. All pharmacists either "liked" the workload documentation system or found it "tolerable". None of the pharmacists indicated that it "required any changes". Over half (57%) of the pharmacists noted that they completed the forms at the end of the day, while 43% completed them at the end of the week. Approximately 15% of pharmacists use the workload documentation forms to follow-up on pre-identified problems; the other pharmacists use their own patient profiles. Pharmacists stated that they liked the system because it was fairly simple, less time consuming, compact, and portable ("the cards fit into my pocket"). The system provides a more comprehensive tabulation of pharmacists' activities and is useful as feedback to pharmacists on their own accomplishments. Areas of improvement identified by the staff, included suggestions to reassess collection of data which do not illustrate an impact on patient care (e.g., number of medication histories or physician rounds), as well as provide regular feedback to the staff on the overall data analysis and utilization. Both of these suggestions are being addressed. This survey demonstrated that the system is satisfactory at present as it minimizes pharmacists' time and probably enhances compliance. Although it appears that hospital and departmental administration find the data meaningful and useful for staff justification, it is evident that more attention will need to be placed on sharing the information with staff for them to realize the overall purpose and benefits of their endeavours.

**Problems and future plans**

Although the staff found the data collection system efficient, the process of collating monthly and quarterly statistics is time consuming. To enhance the efficiency of data management and analysis, future plans include increased computerization (e.g., bar coding) and evaluation of frequency of data collection.

As our clinical pharmacy service evolves to incorporate the philosophy of Pharmaceutical Care into practice, we need to reassess and refine the workload documentation system to reflect changes in our activities, as well as to meet the requirements of the Management Information Systems Guidelines in Pharmacy Workload Measurement.[13]

In conclusion, a clinical documentation system was set up with the goal of meeting several criteria. The system appears to comprehensively capture the pharmacists' clinical workload and minimizes the pharmacists' time involvement. In addition to providing data on pharmacists' patient care activities, the system incorporates patient-oriented outcomes and cost-savings. Therefore, it is meaningful to departmental management and hospital administration in supporting staff justification and providing evidence for pharmacists' impact on patient care. Furthermore, pharmacist's workload data are useful in monitoring staff performance, identifying needs for staff development and in planning future clinical directions. Because the program is ongoing, data are available for use in annual comparisons and departmental trend analysis.

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## Appendix A

### Activities documented for the Clinical Workload Documentation System

**a) Clinical Activities**

- # Orders clarified
- # Trouble shooting
- # Orders changed to formulary
- # Patients assessed (preliminary)*
- # Patients intensively monitored *
- # Charts reviewed *
- # Patients for pharmacokinetic dosing and number of charts reviewed and number of calculations *
- # Adverse drug reactions reported
- # Drug Information Requests
- # Medication Histories *
- # Inservices
- # Patients counselled (individual, group and self-medication)
- # Kardex Rounds attended
- # Physician rounds attended

* Workload units available from the National Hospital Productivity Improvement Program - Pharmacy Workload Measurement System[10]

**b) Clinical effectiveness: (Patient oriented outcomes)**

- # Patient drug-related problems identified
- % Drug-related problems solved or prevented
- # Therapeutic interventions made (include statistics for FTI)
- % Therapeutic Interventions accepted by physician

**c) Cost savings: (Financial savings resulting from "Focused Therapeutic Interventions")**

- # Focused therapeutic interventions made
- % Interventions accepted
- Cost-savings resulting from interventions (drug and administration costs)
- Cost of pharmacists' time

## Appendix B

### Focused Therapeutic Intervention (FTI) Program

| DRUG | AREA OF FOCUS |
|---|---|
| cefazolin | q6h to q8h |
| clindamycin IV | q6h to q8h |
| clindamycin IV | change to metronidazole |
| metronidazole IV | q6h to q8h |
| metronidazole IV | change to oral |
| vancomycin po | change to metronidazole |
| vancomycin po | 250mg to 125mg |

| DRUG | AREA OF FOCUS |
|---|---|
| tobramycin | change to gentamicin |
| famotidine IV | change to oral |
| famotidine IV | change to sucralfate |
| ranitidine IV | change to oral |
| ranitidine IV | change to sucralfate |
| salbutamol solution ipratropium solution | change to puffers |
| RATS | discontinue when cyclosporine levels are therapeutic |

## Appendix C

## Clinical Workload Documentation - Data Collection Cards

### Card 1 (side one and two)

**Pharmacist:** _____ **Mon/Yr:** _____

| COUNT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Order Clarification | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| NFD to FD | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| PPM Assessment (# patients) | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| PPM Intensive (# patients) | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| PPM Chart Review (# charts) | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| PCK (# pts) | | | | | | | | | | | | | | | | | | | | | |
| PCK (# chart reviews) | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| # PCK calculation | | | | | | | | | | | | | | | | | | | | | |
| Med. History | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| ADR | | | | | | | | | | | | | | | | | | | | | |
| Kardex Rounds | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| MD Rounds | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

### DRUG INFORMATION QUESTIONS DOCUMENTATION (*)

**Pharmacist:** _____ **Mon/Yr:** _____

| DI Question | Category | Who Asked? [MD, RN, PRN] | Answer | Time |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

1. Availability 2. Identification 3. Drug Product Information 4. Dose/Route of Administration 5. Compatibility
6. Drug of Choice/Therapeutic Efficacy 7. Pharmacokinetics 8. Drug Interactions 9. ADR 10. Other

(*) Original version contains 20 lines

## Appendix C (cont'd)

## Clinical Workload Documentation – Data Collection Cards

### Card 2 (side one and two)

Pharmacist Documentation of Drug Related Problems(*)

**Pharmacist:** _____ **Mon/Yr:** _____

| Patient Name (Unit) | Drug Related Problem (State) | Cat. | Pharmacotherapeutic Goal (Endpoint) | Recommendation Made (State) | Acc? Y/N | PE? Y/N |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Cat - Category of Drug Related Problems (DRP):
NI - No Indication I - Indication WP - Wrong Product LD - Low Dose HD - High Dose
NA - Not Administered SE - Side Effect DI - Drug Information WT- Wrong Time
Note: Acc? - Recommendation Accepted? PE? - Therapeutic Endpoint Achieved?

(*) Original version contains more lines

### Focused Therapeutic Intervention (FTI)

**Pharmacist:** _____ **Mon/Yr:** _____

| FTI Type | # Screened | # Inappropriate | # Accepted | # Doses Saved | Time (min) |
|---|---|---|---|---|---|
| Cefazolin (Q6 → Q8) | | | | | |
| Clinda → MTZ | | | | | |
| Clinda (Q6 → Q8) | | | | | |
| MTZ (IV → po) | | | | | |
| MTZ (Q6 → Q8) | | | | | |
| Vanco (250 → 125mg) | | | | | |
| Vanco (po → MTZ) | | | | | |
| Tobra → Gent | | | | | |
| Famotidine* | | | | | |
| Famotidine** | | | | | |
| Ranitidine* | | | | | |
| Ranitidine** | | | | | |
| Salbutamol | | | | | |
| RATS - D/C when Cyclosporin therapeutic | | | | | |

* Change from IV to po of same product
** Change from IV of first product to po sucralfate

## Appendix D

## Clinical Workload Documentation - Quarterly Report

### a) Clinical Workload

| Workload Indicators | Total 1991/2 | Monthly Average 1991/2 | Monthly Average 1990/1 | Monthly Average 1989/90* |
|---|---|---|---|---|
| # Orders Clarified | 5412 | 451 | 667 | NA |
| # Trouble Shooting | 3873 | 323 | 339 | NA |
| # Orders Changed to Formulary | 858 | 72 | 85 | NA |
| PPM: | | | | |
| # Preliminary | 1380 | 115 | 164 | NA |
| # Intensive | 1299 | 108 | 186 | NA |
| # Charts | 951 | 80 | 88 | NA |
| PCK: | | | | |
| # Patients | 1380 | 115 | 164 | NA |
| # Charts | 1299 | 108 | 186 | NA |
| # Calculations | 951 | 80 | 88 | NA |
| #ADR Reported | 15 | 1 | NA | NA |
| # DI Questions | 3,207 | 267 | 238 | 112 |
| # Med Hx | 549 | 46 | 72 | NA |
| # Inservices | 87 | 7 | NA | NA |
| Pt Counselling | | | | |
| # Individual | 720 | 60 | 72 | NA |
| # Group | 444 | 37 | 34 | NA |
| # Self-Med | 84 | 7 | 7 | NA |
| Total | 1,245 | 104 | 113 | 119 |
| # Teaching Classes | 102 | 9 | 7 | 7.4 hr/month |
| # Kardex Rds | 486 | 41 | 37 | 30hr/month |
| # MD Rds | 594 | 50 | 54 | |

*Workload data collected in the previous documentation system

## Appendix D (con't)

## Clinical Workload Documentation - Quarterly Report

### b) Clinical Effectiveness Indicators: Patient Oriented Outcomes

| Workload Indicators | Total 1991/2 | Monthly Average 1991/2 | Monthly Average 1990/1 | Monthly Average 1989/90* |
|---|---|---|---|---|
| #Therapeutic Interventions | 5,187 | 432 | 547 | 219 |
| % Interventions Accepted | 92% | 92% | 91% | NA |
| # Drug-Related Problems identified | 3,804 | 317 | 382 | NA |
| % Drug-Related Problems solved or prevented | 81% | 81% | 75% | NA |

* Workload data collected in the previous documentation system

### c) Cost Effectiveness Indicators:

### Financial Savings Resulting From Focused Therapeutic Intervention Program (FTI)

| Workload Indicators | Total 1991/2 | Monthly Average 1991/2 | Monthly Average 1990/1 | Monthly Average 1989/90* |
|---|---|---|---|---|
| # FTI Made | 504 | 42 | 92 | NA |
| % FTI Accepted | 86% | 86% | 80% | NA |
| Cost Saving ($):<br>Drug Acquisition<br>Administration (IV)<br>Total | <br>18,165<br>9,750<br>27,915 | <br>1514<br>813<br>2,327 | <br>2,391<br>1,408<br>3,799 | NA |
| Cost of Pharmacist Time ($) | 1,170 | 97 | 224 | NA |
| Cost Effectiveness Ratio** | 24 | 24 | 17 | NA |

*Workload data collected in the previous documentation system
** Total cost saving divided by cost of pharmacists' time required to achieve the cost saving