Increase in Number and Diversity of Clinical Interventions by Pliarm D Students Over a Clerkship Rotation

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The objective of this study was to characterize interventions made by fourth year Doctor of Pharmacy students. Student interventions were assessed during their first, third and fifth week of a six-week inpatient rotation. Twenty-seven students completing their fourth year inpatient clerkships at UCSF participated. The number, nature, and outcome category for all interventions were documented using a documentation system currently in place at the University of California, San Francisco (UCSF). Statistical analysis on the number of interventions over time was performed using Poisson regression. Certain outcome categories were assigned a significance rating. Interventions were also evaluated for associated drug costs, time spent to complete the intervention, and acceptance rate by physicians. Students performed 349 interventions over the 15-day study period. The sum total of interventions increased significantly over time from week 1 to week 5 (P=0.042). On average, students performed 1.8 to 4.9 to 6.2 interventions per student per week in weeks one, three, and five, respectively. Interventions also increased in diversity as the clerkship advanced. In outcome categories receiving significance ratings, scores were moderate to high 73.6 percent of the time. Annualized drug costs indicated a savings of $521.81 per student. Physician acceptance rate was 92.5 percent. It can be concluded that student interventions impact positively on patient care and increase in number and diversity with advancing clerkship experience.

BACKGROUND

Training Doctor of Pharmacy (PharmD) students on clerkship rotations can be viewed as a burden or expense(1). In this setting, the additional pharmacist supervision required takes time away from direct patient care and other clinical responsibilities. This view has been compounded by the advent of managed care, in which hospital administrators are requiring pharmacy managers to maintain or improve their services amidst budgetary cuts and downsizing. In response, cost justification of pharmacists’ services has become a necessity. To maintain teaching sites and the involvement of students in clerkship rotations, it is essential to show that students can enhance patient care and provide a value-added service.

Several studies have documented the provision of pharmaceutical care by PharmD students(2-5). Few have attempted to show the costs associated with student interventions(2,4). Even fewer have attempted to quantify and qualify these interventions over time with increasing student training(6,7). In addition, much of the focus in previously published literature has been on the intervention itself, without asking students to consider the potential outcome their interventions might have on patient care(2,3,5,7).

It is our hypothesis that a well-prepared student can contribute to and add value to patient care. Utilizing a documentation system in which all interventions were directed towards a specific patient outcome category, students were asked to think beyond the intervention itself, and direct their focus on how their actions could affect patient care. By evaluating these interventions during the 1st, 3rd, and 5th weeks of the student’s inpatient rotation, this study attempts to show that the number and diversity of interventions increases over time. In addition, the nature, clinical significance, potential outcome, cost impact, and average time for completion of all interventions are summarized.

METHODS

The University of California San Francisco (UCSF) School of Pharmacy offers an entry-level PharmD degree program. PharmD students complete three years of professional pharmacy school and one year of clinical rotations. In their fourth professional year, students are assigned to one of four University of California campuses for completion of their clinical rotations. These rotations are comprised of a 12-week outpatient experience, a 12-week inpatient experience, and 12-24 weeks of electives. Typically, one to two students are assigned to each inpatient service where they round with the medical team and monitor patients throughout the day.

A uniform system for documenting pharmaceutical care (PCDoc system) was implemented at UCSF in April 1995. The system consisted of a hard-copy form for documenting the intervention which was subsequently entered into a relational database management system (Microsoft Access TM) for analysis(8). Both pharmacist and student interventions were entered into this database. While phar-
Table I. Interventions and desired outcomes

<table>
<thead>
<tr>
<th>Decrease drug costs</th>
<th>Optimize drug therapy (maximize efficacy/ minimize failure)</th>
<th>Minimize ADRs/toxicity</th>
<th>Increase patient satisfaction</th>
<th>Increase reimbursement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrease dose/ frequency of administration</td>
<td>Change drug dosing</td>
<td>Discontinue drug for allergies</td>
<td>Facilitate continuity of care</td>
<td>Complete/initiate TAR</td>
</tr>
<tr>
<td>Decrease duplication of therapy</td>
<td>Select/recommend best initial therapy</td>
<td>Discontinue drug for contraindications</td>
<td>Adjust therapy to patient lifestyle</td>
<td>Other</td>
</tr>
<tr>
<td>Decrease duration of therapy</td>
<td>Select alternative therapy</td>
<td>Manage ADR</td>
<td>Serve as patient advocate</td>
<td>Healthcare/drug education</td>
</tr>
<tr>
<td>Discontinue drug (not indicated)</td>
<td>Select alternative route</td>
<td>Select alternative therapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change Route (IV vs PO)</td>
<td>Manage drug interaction</td>
<td>Change drug dosing</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Decrease unnecessary labwork</td>
<td>Manage diet interaction</td>
<td>Manage drug interaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change to formulary drug</td>
<td>Obtain/interpret labwork</td>
<td>Manage diet interaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decrease drug waste</td>
<td>Manage drug in compatibilities</td>
<td>Obtain/interpret labwork</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change to less expensive agent</td>
<td>Educate patient</td>
<td>Initiate therapy (to minimize toxicity)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Educate patient</td>
<td>Other</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Patient education intended to optimize drug therapy or minimize ADRs/toxicity (e.g., take on an empty stomach, take at bedtime, extensive education on warfarin, steroid tags, and asthma inhalers).*

*e.g., arrange homecare, discharge planning, contact follow-up providers.*

*e.g., change dosing from a QID to QD regimen to enhance compliance.*

*e.g., act as liaison between patient and other members of health care team, facilitate a patient’s ability to obtain a medication.*

*e.g., includes non-drug patient education (e.g., diet, exercise).*

*Treatment authorization request (TAR).*

*e.g., switching to a drug covered by patient’s insurance carrier.*

Pharmacists were each assigned individual identification codes, students were assigned one uniform code.

Specific information (e.g., drug acquisition cost maintained from contract and wholesaler data, frequency of medication use) was imported from the pharmacy information management system (DigimedicsTM) into the relational database.

The hard copy form or PCDoc form included patient-specific information such as patient age, primary diagnosis related to the intervention, and the medical service where the patient was seen. Additional information which was specific to the intervention included: a brief description of the problem, the drug involved (including dose, route, and schedule), the nature and potential outcome of the intervention, and the resolution (i.e., accepted, modified, or rejected). All interventions were targeted towards one of five potential outcome categories: (i) Optimizing Drug Therapy; (ii) Minimizing Adverse Drug Reactions (ADRs) or Drug Toxicity; (iii) Decreasing Drug Costs; (iv) Increasing Reimbursement; or (v) Increasing Patient Satisfaction. A complete list of the nature of interventions with examples is described in Table I. Appendix A is a duplication of the PCDoc form.

Twenty-seven students completing their fourth year clinical rotations at UCSF participated in the study. From October 1995 to January 1996, students were asked to document their PC interventions over a five-day period during the first, third, and fifth week of a six-week inpatient rotation. An inservice was conducted to educate the participating students on how to use the PCDoc form. As this documentation system was already in use throughout the hospital, previous inservices had been conducted to educate pharmacy staff and faculty. To be included in the analysis, the intervention had to be tied to a specific patient and one of the defined outcome categories. Interventions involving the general provision of drug information that was not patient specific and clarification of medication orders were not included.

Students presented their interventions to a faculty preceptor or a pharmacy resident before making a recommendation to the medical team. All completed intervention forms were then reviewed by two independent pharmacists to ensure that all the necessary information had been included. If the documented intervention required further clarification or was incomplete, it was returned to the student for completion and resubmission. Interventions which fell into either the Optimize Drug Therapy or Minimize ADRs/Toxicity outcome category were assigned a significance rating by the two reviewers. The significance rating scale, described in Table II, ranged from minimal (Level 1) to high significance (Level 3) and was adapted from previously published severity scales. In cases in which the two reviewers differed in their significance rating, a final significance score was determined by a PCDoc committee, consisting of eight pharmacists.

A cost analysis of the interventions was performed by comparing the “before and after” drug acquisition costs for a 24-hour period. Cost differences, both positive and negative, were computed for the outcome categories.
Table II. Significance rating criteria

<table>
<thead>
<tr>
<th>Level 1 (Low)</th>
<th>Level 2 (Moderate)</th>
<th>Level 3 (High)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interventions likely to:</strong></td>
<td><strong>Interventions likely to:</strong></td>
<td><strong>Interventions likely to:</strong></td>
</tr>
<tr>
<td>Optimize Drug Therapy&lt;sup&gt;a&lt;/sup&gt;</td>
<td>increase patient compliance</td>
<td>reduce the length of stay or number of clinic visits due to improved response</td>
</tr>
<tr>
<td></td>
<td>improve comfort or overall well-being of patient&lt;sup&gt;e&lt;/sup&gt;</td>
<td>minimize treatment failure due to improved response&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Minimize ADRs/Toxicity&lt;sup&gt;b&lt;/sup&gt;</td>
<td>decrease the risk of minor side effects (i.e. side effects in which the patient may be uncomfortable but is not at risk for additional complications)&lt;sup&gt;d&lt;/sup&gt;</td>
<td>decrease length of stay, rehospitalizations, or clinic visits by minimizing ADR/toxicity</td>
</tr>
<tr>
<td></td>
<td>in which the patient is at risk for additional complications&lt;sup&gt;d&lt;/sup&gt;</td>
<td>decrease the risk of moderate side effects (i.e. side effects in which the patient is at risk for moderate patient suffering, excluding lifetime disability or death)&lt;sup&gt;f&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>Interventions likely to improve patient outcome with optimization of drug therapy.

<sup>b</sup>Interventions likely to decrease the likelihood of adverse drug reactions and toxicity or effectively manage an ADR or toxic reaction which has already occurred.

<sup>c</sup>e.g., initiating a stool softener for constipation or a sedative for insomnia.

<sup>d</sup>e.g., minimizing risk for minor headache, nausea, heartburn or dermatological symptoms by decreasing a dose.

<sup>e</sup>e.g., increasing the dose of an anticoagulant for a subtherapeutic lab value, switching prophylactic antifungal from ketoconazole to fluconazole in a patient on an H2 blocker or omeprazole.

<sup>f</sup>e.g. reducing the dose of an aminoglycoside to avoid nephrotoxicity, addition of pyridoxine in an elderly patient receiving isoniazid to prevent peripheral neuropathy.

<sup>g</sup>e.g. initiation of trimethoprim/sulfamethoxazole in a patient with AIDS and a CD4 count of < 200, increasing the dose of a cephalosporin in a patient with meningitis.

<sup>h</sup>e.g. prevention of calcium-phosphate precipitation in a total parenteral nutrition (TPN) admixture, initiation of DVT prophylaxis with heparin in an obese patient who had not been ambulating for > 3 weeks.

Involving: Decrease Drug Cost, Optimize Drug Therapy, and Minimize ADRs/Toxicity. Indirect costs and additional direct costs associated with length of hospitalization were not evaluated.

Statistical analysis of the weekly count totals made recourse to Poisson regression. Poisson assumptions are standard for count data; by performing Poisson regression using “week” as covariate, time trends in the underlying Poisson rates can be evaluated<sup>12</sup>. In addition to the Poisson assumption, the validity of this approach rests on there being equal numbers of students evaluated each week. The database used in this study, used a singular code for identification of all student interventions. As such, this precluded formally testing these assumptions, and also from fitting more elaborate models. Furthermore, sample size was effectively reduced to three (corresponding to the three weeks), so that inference could be referenced to a t distribution on one degree of freedom and, accordingly, only extreme results would achieve formal significance. Probability values of $P < 0.05$ were considered to be statistically significant.

RESULTS

Three hundred forty-nine PCDoc forms met inclusion criteria and were submitted by 27 students over the three, five-day study periods. During weeks one, three, and five, students completed 49, 133, and 167 interventions or 1.8, 4.9, 6.2 interventions per student per week, respectively. The sum total of interventions from all outcome categories increased significantly ($P = 0.042$) over time (i.e., from weeks one to three to five).

![Fig. 1. Sum total of interventions by outcome category.](image-url)

Outcome Category and Nature of Interventions

The nature and number of interventions in each outcome category is listed in Table III and Figure 1. Interventions intended to Optimize Drug Therapy were the most frequent (168/349, 48.1 percent), while interventions intended to Increase Reimbursement were the least frequent (2/349, 0.6 percent). Excluding the Increase Reimbursement category which only had two interventions, the total number of interventions in each outcome category more than doubled from week one to week three. Increases were less dramatic from week three to week five ranging from 8.8 percent in the Minimize ADRs/Toxicity to 76 percent in the Decrease Drug Cost category. Despite these increases, statistical significance was not achieved for individual outcome categories of Decrease Drug Cost ($P = 0.077$), Minimize ADR/Toxicity ($P = 0.080$), Optimize Drug Therapy ($P = 0.073$), or Increase....
Patent Satisfaction ($P=0.107$).

Of the 38 types of interventions which comprised the five outcome categories (Table I), there were no interventions for three types during weeks one, three or five. Thirty-three (94.3 percent) of the remaining 35 intervention types increased in number from week one to weeks three or five that were not performed in week one. The diversity of interventions also increased over the duration of the rotation, with a 50 percent increase, 19/38, new intervention types being performed in weeks three or five that were not performed in week one. Excluding the Increase Reimbursement category, the most frequent type of intervention in each outcome category was: (i) Decrease Drug Costs - “discontinue drug (no indication);” (ii) Optimize Drug Therapy – “change drug dosing;” (iii) Minimize ADRs/Toxicity - “change drug dosing;” (iv) Increase Patient Satisfaction - “facilitate continuity of care.”

**Significance**

Interventions which fell into the Optimize Drug Therapy or Minimize ADRs/Toxicity categories were analyzed for their significance (i.e., potential impact) on patient outcome. Of the 247 interventions, 74.1 percent were assigned a significance rating of two or three, indicating a moderate or high level of potential impact on patient outcome. Three interventions (1.2 percent), were assigned a Level 3 significance score and included: (i) a fifty percent reduction in ceftriaxone dosing for a patient with end-stage renal disease and bacterial meningitis to prevent the occurrence of seizures; (ii) initiation of a triple antibiotic regimen, previously monotherapy, for synergistic treatment of documented methicillin-resistant *S. aureus* and *S. epidermidis* in a patient with a prosthetic implant and spinal osteomyelitis; (iii) doubling the maintenance dose and initiating a loading dose of phenytoin to prevent seizures in a post-surgical craniotomy patient with a phenytoin level of 2 mg/dl on the previous maintenance dose.

**Time**

Over the three-week study period, 73.1 hours were spent performing interventions, with an average of 12.6 minutes per intervention. On an individual basis, interventions aimed at Increasing Reimbursement and Increasing Patient Satisfaction were the most time consuming, while interventions intended to Decrease Drug Cost took less time to perform. The average time required for each outcome category is summarized in Table IV.

**Resolution and Drug Costs**

Pharmacy students’ interventions were accepted by physicians without modification 92.5 percent of the time; accepted with modification 3.5 percent of the time; and rejected 4.0 percent of the time. Based on the pharmacy reviewers’ assessments, rejected forms would not have resulted in adverse patient outcomes.

The cost savings or deficits listed in Table IV were determined for selected outcome categories using acquisition drug costs. Only the Decrease Drug Cost category resulted in an overall cost savings, while the other two outcome categories both had cost deficits. Overall, a drug cost savings of $578.75 was maintained for the 15-day study period. Annualized to one year, the cost savings for drugs alone would be an estimated $14,089 or $521.81 per student.

**DISCUSSION**

The primary purpose of this study was to demonstrate that students can add value to patient care through the interventions that they perform and that the type and number of these interventions increase over the course of a clerkship rotation. On average, students performed 4.3 interventions per student per week. This was similar to other
published studies such as Chrisholm et al. in which 15 students performed 174 interventions over a four-week inpatient rotation or 2.9 interventions per student per week(3). Slaughter et al. looked at student interventions which occurred in both the inpatient and outpatient setting and found that on average each student performed 22 interventions over a four-week rotation or 5.5 interventions per student per week(2).

Outcome Category and Nature of Interventions

The sum total of interventions performed in all outcome categories increased significantly (P=0.042) from weeks one to three to five, respectively. The number of interventions in individual outcome categories increased over time but did not achieve statistical significance. This was not surprising as the statistical test used could only detect extreme differences. Statistical comparisons for the total number of interventions in the Increase Reimbursement category were not performed, as there were only two interventions in this category.

Two other studies have examined the effect of increased training on student interventions in the inpatient setting(6,7). Kane et al. found a decrease in the total number of drug-related problems that students identified as they progressed from zero to three semesters of didactic training using the Pharmacist’s Work-up of Drug Therapy (PWDT) approach(6). Comparison of our results to Beck et al. were more difficult as their methodology included interventions involving “drug information requiring little patient specificity” and “patient medication histories,” which would not have been considered interventions by our criteria. Overall, however, Beck found little change in the total number of interventions being performed from week one to week five(7).

In this study, students appeared to have gained adequate experience to feel comfortable and competent in making interventions by week three. This is demonstrated by a more dramatic rise in intervention numbers from week one to week three. From week three to week five there was a less dramatic rise, indicating a possible threshold in the number of interventions students could perform.

We cannot state with any certainty that the increase in intervention number over time seen in this study was a direct result of advancement in student learning. There are other factors which could have contributed, such as increased familiarity with house staff and the PCDoc form over time. In support of the theory of increased student learning is the diversity of interventions which took place as the clerkship progressed. Specifically, there were 19/38 or a 50 percent increase in the types of interventions students performed at weeks three or five compared to week one. Kane also found an increase in the diversity of interventions performed by students having more didactic training(6).

We were not surprised to find that students performed few interventions in the outcome category of Increasing Reimbursement. At our institution, this category has typically been used to document interventions taking place in the outpatient setting such as the completion of a treatment authorization request (TAR) in order to obtain a medication for a patient(8). The present study was confined to the inpatient setting, limiting interventions within this outcome category to just two.

Significance

In outcome categories which received a significance rating, a majority of interventions were considered to be of moderate to high significance, 73.6 percent. This compared favorably to other studies where the percentage of significant to extremely significant interventions made by students ranged from 68-73 percent(3,4). Thus, reinforcing the notion that student contributions tend to enhance patient care and reduce adverse events.

Time

Time spent performing an intervention ranged from 8.6 minutes to 50 minutes. Interventions intended to Increase Patient Satisfaction and Increase Reimbursement were the most time consuming. A majority of interventions in the former outcome category were aimed at facilitating continuity of patient care. These types of interventions typically involve discharge planning and arranging follow-up visits for patients after they leave the hospital. As such, they can be very time consuming. In the latter outcome category, there were only two interventions, which may have erroneously skewed the time report of 50 minutes per intervention. In general, the time students spent performing interventions in the other three outcome categories was quite similar to the time required for pharmacists to perform similar interventions(8). Specifically, in a previously published study utilizing the same documentation system, pharmacists spent an average of 6.8, 9.9, and 11.6 minutes per intervention in outcome categories involving Decrease Drug Cost, Optimize Drug Therapy, and Minimize ADRs/Toxicity(8).
Resolution and Drug Costs

Physician acceptance was high, 92.5 percent, and fell within the range of acceptance rates reported in the literature, 78.7-94.8 percent(2-4). This high acceptance rate may have been influenced by the teaching methodology at our institution, in which students discuss their recommendations with faculty preceptors or pharmacy residents before they make suggestions to the medical staff. In fact, students may have been less likely to complete PCDoc forms for those interventions which were not considered favorable by their preceptor.

For all students, there was a net drug cost savings of $578.75 over the 15-day study period. Although there was an increase in costs associated with outcomes intended to Optimize Drug Therapy, many of these interventions required the initiation of new drug therapy or increasing drug dosing, making a rise in drug cost expected. Interestingly, Davis et al. concluded that the net cost required to educate a PharmD student for a four-week clinical rotation was $544(1). The latter study addressed costs associated with the time students spent with preceptors as compared to the time they saved preceptors and did include drug costs associated with student interventions. Other studies evaluating drug costs associated with student interventions, have reported cost savings in the outpatient setting, and an assumed (i.e., based on the author’s subjective assessment) cost savings in the inpatient setting(2,4).

Limitations

The intent of this study was not to document all activities in which students were involved. Other studies have attempted to capture these professional and clinical activities(5). The time and drug cost analysis of student interventions did not include any estimate of time spent by preceptors in educating students or the costs associated with said time. Conversely, we did not factor in costs of pharmacist release time to provide other services. The cost analysis captured changes in drug costs but did not assess the cost impact that student interventions might have on length of stay or in the prevention of adverse events. Thus, the impact of student interventions on overall health care costs remain unknown.

The total number of interventions reported by students may have been negatively influenced by the voluntary nature of the reporting system as well as the time required to complete the PCDoc form. The form was somewhat cumbersome and may have deterred students from filling it out. On the other hand, the intervention total may have been positively influenced by the student’s ability to validate their recommendations with preceptors before making suggestions to the medical staff.

Our review committee, which assessed significance of interventions, was entirely composed of pharmacists. This may have biased significance scoring in a more positive fashion than if the committee had included physician reviewers.

Finally, due to the use of a uniform computer code for entry of all student interventions it was not possible to evaluate the impact of individual students on study results. As such, the extent of statistical analysis was limited.

CONCLUSION

This data confirms the hypothesis that students perform a valuable service to patients through their interventions. The sum total of interventions increased significantly over time (P=0.042). In addition, the diversity of interventions increased as students proceed throughout their inpatient clinical rotations. Students appear to begin making substantial contributions to patient care by the third week of their clerkship rotation which is sustained in their fifth week. While not substantial, drug cost savings are realized through student interventions. Studies assessing student interventions as a function of advancement in clinical training are still limited; hopefully more documentation will be forthcoming.


References


APPENDIX A. PHARMACEUTICAL CARE DOCUMENTATION FORM

UCSF Pharmaceutical Care Form

(rev 11/1/95) Date:_________

Digimedics ID #: ______ Last name: ______ First Initial: ______

Type of intervention: □ Inpatient □ Outpatient
□ pharmacist □ resident/fellow □ student

Site of intervention: □ Pt Care Area/Satellite □ Rounds □ Main Pharmacy □ Telephone □ Other:

Patient Unit # (12-digit) ____________-__________

DOB: ______/_____/______

Service/Clinic: _______________________

Diagnosis: __________________________
Interventions and Desired Outcome (please select the ONE box that best describes your intervention. Use separate form(s) for multiple interventions):

--- Cost Avoidance ---
1. □ In dose/frequency of admin.
2. □ Duplication of therapy
3. □ Duration of therapy
4. □ DC drug (not indicated)
5. □ Change Route (IV vs PO)
6. □ Unnecessary labwork
7. □ Change to formulary drug
8. □ Drug waste
9. □ To less expensive agent
10. □ Other: ______________________

Optimize Drug Therapy
(maximize efficacy/minimize failure)
11. □ Change drug dosing
12. □ Select/recommend best initial Tx
13. □ Select alternative therapy
14. □ Select alternative route
15. □ Manage drug interaction
16. □ Manage diet interaction
17. □ Obtain/interpret labwork
18. □ Manage drug incompatibilities
19. □ Educate patient
20. □ Other: ______________________

Minimize ADRs/Toxicity
21. □ DC drug for allergies
22. □ DC drug for contraindications
23. □ Manage ADR
24. □ Select alternative therapy
25. □ Change drug dosing
26. □ Manage drug interaction
27. □ Manage diet interaction
28. □ Obtain/interpret labwork
29. □ Initiate Tx (to minimize toxicity)
30. □ Educate patient
31. □ Other: ______________________

Increase Patient Satisfaction
32. □ Facilitate continuity of care
33. □ Adjust Tx to pt. lifestyle
34. □ Serve as patient advocate
35. □ Healthcare/drug education
36. □ Other: ______________________

Increase Reimbursement
37. □ Complete/initiate TAR
38. □ Other: ______________________

39. Drug(s) Before
(Include Generic Name, Dose, Route, Frequency, Duration):

40. Drug(s) After (Include Generic Name, Dose, Route, Frequency, Duration):

41. Brief explanation of patient problem which led to the intervention:

42. Was intervention: □ self-initiated □ MD request
□ RN request □ Pt. request □ other: ________________

43. Objectives (i.e. goal of intervention). Be as specific as possible:

44. Would you expect the intervention to reduce the duration of hospitalization or frequency of clinic visits?
□ Yes □ No □ Unknown

45. Recommendation:

46. Resolution: □ Accepted □ Rejected
□ Modified (explain):

47. Follow-up: please relate to objective(s) described above.

48. Time required for intervention(s): _______ minutes