Evaluating the Clinical Interventions of Students During Clerkships Using a Cognitive Services Claim Form

Jason B. Reddick and John E. Murphy

College of Pharmacy, The University of Arizona, PO Box 210207, Tucson AZ 85721-0207

In order to determine the extent and frequency of such events, ten fourth-year Doctor of Pharmacy candidates used a method of documentation to quantify their clinical interventions during two weeks each of three of four selected advanced pharmacy practice experiences between July 1997 and March 1998. Encounters (338) were documented and data collected at 27 clerkship sites. At least 64 percent of the recommendations corresponded with the resulting actions of physicians or staff. The average time spent by students per encounter was 21 minutes. On average, the students accounted for over 90 percent of the impact of the intervention (versus preceptor) and most frequently rated their interventions as “significant.” The students made positive contributions to clerkship sites as shown by their impact, perceived significance, and results of their interventions. Further work should be done to document all aspects of the student’s interactions and the potential financial value to institutions.

INTRODUCTION

As the practice of pharmacy continues to become more clinically oriented, experiential clerkship rotations are vital elements in the education of PharmD students. With the downsizing and re-engineering being used in the health care system to deal with increased economic pressures, pharmacists in all practice settings are faced with the task of continuing to provide high quality services despite cost containment measures. This can lead to situations where it is perceived that commitments to colleges for experiential training of students are excessive and not of sufficient value to the healthcare site. Conflict may then result, pitting colleges desiring hands-on training for students against administrators in the healthcare sites who are fighting financial constraints. The administrators may require their employees to fulfill obligations and services within the institution rather than providing teaching services. This conflict is often resolved by colleges of pharmacy paying practice sites, occasionally in excess of $200,000 annually, for their educational involvement, sometimes leaving students with the need to pay higher tuition and fees to cover costs incurred by the colleges(1).

A number of authors have analyzed the value of students on clerkship as well as the justification Colleges of Pharmacy have in paying fees to institutions so that an adequate balance of quality and quantity of these experiences are available. Slack, Draugalis and Carter described the literature evaluating costs associated with training students as inconclusive(1,2). They pointed out that some studies have found that institutions incur net costs in training students, while others have demonstrated net benefits. Anderson surveyed directors and staff in fifteen hospitals where a fee was paid per student trained(3). He found that these pharmacists believed that students should not be relied upon to expand clinical services and that orientation and training are often time-consuming. On the other hand, though no financial evaluation was applied to the study, Chisholm, et al. concluded that PharmD students can have a positive impact on patient care(4). The authors of a cost-analysis study argued that institutions obtain real benefit in improved patient care through the activity of PharmD students on rotation(5). A study where students used computerized documentation of their activities actually led to an increase in the number of students taken on clerkship due to their contributions to productivity at the site(6). Knowledge of the patient care interventions of students, and therefore part of their potential beneficial impact on a practice site might be useful when colleges of pharmacy negotiate financial reimbursement to institutions in return for providing experiential training.

As reforms in the health care system continue, documenting the value of pharmacy services and interventions for cost-justification purposes is increasingly important. It has been suggested that for the profession of pharmacy to maintain its role as an active player in the health care world, innovative strategies are necessary for documenting pharmacists’ contributions(7). Others have suggested that justification is best accomplished through documentation of services that positively impact the delivery of effective health care(8). The National Community Pharmacists’ Association (NCPA) took a step in this direction with the development of their Pharmacist Care Claim Form that is designed to help pharmacists obtain reimbursement for providing services(9).

The primary purpose of this study was to use a documentation method to quantify and qualify the clinical interventions of fourth-year PharmD students during three of four selected clerkships in order to determine the frequency and extent of such events. Other objectives included determining the frequency, type, and significance of interventions by rotation site and whether differences existed among the types of interventions by site.

METHODS

Ten fourth-year PharmD candidates from the University of Arizona were selected and asked to record recommendations...
and services provided to patients during selected clerkships. All the students selected agreed to participate and gather data. Adult Acute Care, Ambulatory Care, Community Pharmacy, and Institutional Pharmacy were the four clerkship types chosen for data collection. Each clerkship rotation is six weeks in duration. Evaluation of recommendations and services provided by the students occurred during ten days over two different weeks at three of the four clerkship types. Each student was asked to provide evaluations during six total weeks of three different rotation sites occurring between July 21, 1997 and March 20, 1998.

Each participant was given a sufficient quantity of PharmD Student Service Evaluation Forms (see Appendix A) in order to record all recommendations made. The form was based largely on the National Community Pharmacists’ Association’s (NCPA) Pharmacist Care Claim Form which contains a comprehensive list of services and recommendations commonly provided by pharmacists in a variety of settings(9). NCPA’s form is used by pharmacists throughout the United States to seek reimbursement in exchange for providing cognitive pharmaceutical care services to patients.

Other areas of the PharmD Student Service Evaluation Form focused on quantifying the value of the PharmD students to their clerkship sites. The students were required to estimate the time spent in providing a recommendation or service. They were also required to estimate their personal “impact” on the recommendation or service. Impact was defined as the percent of time spent by the student on the recommendation compared to that spent by the responsible pharmacist or physician. Students also estimated a level of significance for each documented event based on an adapted version of previously published criteria (8) - see Appendix B. The final section of the form consisted of a discussion section in which students summarized the clinical events and noted any specifics that occurred during the encounters such as drug name, dose modification, or dosing schedule change.

In order to provide an overall understanding of the project, each student was mailed an overview of the project discussing its goals, objectives, and importance. Students were contacted by phone or in person at least one week prior to the start of their data collection period. The last two clerkship days of the week preceding the initial data collection period for each student were used to perform mock recommendations in order to improve reliability. Students were contacted immediately thereafter to discuss questions regarding cases, reasons for scoring at each level, and to answer any additional questions related to the project. Students were contacted at least once during data collection weeks for reminders and follow-up.

The subjects were a convenience sample of students of the Class of 1998 (52 students total) who were preparing to enter their clerkship year. The students were selected based on a combination of performance in the classroom, demonstrating past tendency to be generally reliable and responsible, and upon having a clerkship schedule compatible with the study. Students were not compensated for their efforts in the study.

Data were collected using the PharmD Student Service Evaluation Form (Appendix A). Data were entered into a spreadsheet (Microsoft Excel 97, Redmond, WA) for analysis. Descriptive statistics were used to assess the extent, type, and number of interventions and to further isolate the data by each student and clerkship site.

RESULTS

Data were collected during 27 clerkships and a total of 338 PharmD Student Service Evaluation forms were returned. All ten students who agreed to participate in the study collected data during the three requested clerkships with the exception of three students who only collected data during two clerkship sites. These students did not make recommendations during their other clerkship (two Institutional Pharmacy Practice sites and one Adult Acute Care Practice site) because they primarily participated in learning activities with limited opportunity to become involved in direct patient interventions.

Students documented 445 “Reasons for services” on the 338 forms returned (average of 1.32 reasons for services per form). The most frequent reasons for services (of the 50 options available) were “Patient education/instruction” (20.4 percent), “Additional drug needed” (7.6 percent), “Laboratory test needed” (5.4 percent), “Patient complaint/symptom” (5.2 percent), and “Prescriber consultation” (4.5 percent). All five of these reasons fell under the subcategory “Disease Management.” The fifteen most frequent reasons for services are listed in Table I.

Students also documented a total 557 “Professional services” performed or an average of 1.65 services per form. The most frequent services provided of the 19 selections in this cat-
The items performed on each form was 1.7 ± 0.7 with a median of 1.8 ± 0.7. The overall average (± SD) scoring of significance for the services documented on each form was 21 ± 32 minutes. The average percent impact of the students compared to the preceptors was approximately 900 minutes for a completion of a drug monograph was 22.7 ± 5 minutes, respectively. It should be noted that an outlying time (range 2-240 minutes). The median and mode were 15 and 10 minutes, respectively. The data were further analyzed by isolating each clerkship type. The fewest forms and “Reasons for services” occurred at the Adult Acute Care sites (11.8 percent). The most frequent “Recommendations” documented (359 total) were “Continue without change” (25.9 percent), “Other” (recommendation other than 12 options available; 22.6 percent), “Change therapy/drug” (21.4 percent), and “Change regimen/dose” (17.8 percent). These four recommendation types accounted for nearly 88 percent of all recommendations.

Of the 359 recommendations provided by the students, 229 (63.8 percent) correlated with “Results of services.” For example, the recommendation to “Change regimen/dose” resulted in “Regimen/dose changed.” Twenty-two recommendations (6.1 percent) did not correlate with the results of services (i.e., a recommendation such as “Change regimen/dose” resulted in “Filled prescription as is”). Finally, the other 108 recommendations (30.0 percent) had unknown or “Other” results. That is, it could not be determined whether the student’s recommendation led to a corresponding result or the student was unsure of the actual result. If the unknown or “Other” results are excluded, 91.2 percent (229/251) of the students’ recommendations correlated with the outcome of the service, while 8.8 percent (22/251) had an outcome unrelated to the recommendation.

“Amount of time spent performing service(s),” “Impact of PharmD student versus preceptor,” and significance scoring were the final items on the form. The average (± SD) time of PharmD student versus preceptor, “Amount of time spent performing service(s),” and Student impact were “Prescriber consulted” (24.1 percent) and “Prescriber consultation” (24.4 percent). The results of all 19 service types are listed in Table II.

The most frequent “Recommendations” documented (359 total) were “Continue without change” (25.9 percent), “Other” (recommendation other than 12 options available; 22.6 percent), “Change therapy/drug” (21.4 percent), and “Change regimen/dose” (17.8 percent). These four recommendation types accounted for nearly 88 percent of all recommendations.

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Table III. The five most common reasons for services and professional services at each clerkship type

<table>
<thead>
<tr>
<th>Clerkship type</th>
<th>Reasons for services</th>
<th>Professional service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Patient education/instruction (36.9%)</td>
<td>Patient education/instruction (39.0%)</td>
</tr>
<tr>
<td></td>
<td>Laboratory test needed (5.4%)</td>
<td>Prescriber consulted (24.4%)</td>
</tr>
<tr>
<td></td>
<td>Additional drug needed (4.6%)</td>
<td>Patient consulted (7.3%)</td>
</tr>
<tr>
<td></td>
<td>Side effect (4.6%)</td>
<td>Medication review (5.7%)</td>
</tr>
<tr>
<td></td>
<td>Patient compliant/symptom (3.8%)</td>
<td>Pharmacist consulted other source (5.7%)</td>
</tr>
<tr>
<td>Institutional</td>
<td>Plan protocol (11.8%)</td>
<td>Medication review (22.7%)</td>
</tr>
<tr>
<td></td>
<td>High dose (9.4%)</td>
<td>Patient monitoring (11.8%)</td>
</tr>
<tr>
<td></td>
<td>Additional drug needed (9.4%)</td>
<td>Dosing evaluation/determination (10.9%)</td>
</tr>
<tr>
<td></td>
<td>Prescriber consultation (7.1%)</td>
<td>Patient assessment (9.1%)</td>
</tr>
<tr>
<td></td>
<td>Laboratory test needed (5.9%)</td>
<td>Recommended laboratory test (9.1%)</td>
</tr>
<tr>
<td>Ambulatory</td>
<td>Patient education/instruction (26.7%)</td>
<td>Medication review (21.0%)</td>
</tr>
<tr>
<td></td>
<td>Patient compliant/symptom (12.1%)</td>
<td>Prescriber consulted (21.0%)</td>
</tr>
<tr>
<td></td>
<td>Laboratory test needed (6.0%)</td>
<td>Patient consulted (15.3%)</td>
</tr>
<tr>
<td></td>
<td>Prescriber consultation (5.1%)</td>
<td>Patient education/instruction (14.2%)</td>
</tr>
<tr>
<td></td>
<td>Other (4.3%)</td>
<td>Patient assessment (6.8%)</td>
</tr>
<tr>
<td>Adult Acute</td>
<td>Additional drug needed (14.0%)</td>
<td>Prescriber consulted (28.4%)</td>
</tr>
<tr>
<td></td>
<td>Patient education/instruction (8.8%)</td>
<td>Medication review (24.3%)</td>
</tr>
<tr>
<td></td>
<td>Low dose (6.1%)</td>
<td>Patient education/instruction (9.5%)</td>
</tr>
<tr>
<td></td>
<td>Drug-disease (6.1%)</td>
<td>Dosing evaluation/determination (8.8%)</td>
</tr>
<tr>
<td></td>
<td>New disease/diagnosis (5.3%)</td>
<td>Patient consulted (8.8%)</td>
</tr>
</tbody>
</table>

Table IV. Average (SD) contributions of PharmD students at each clerkship site

<table>
<thead>
<tr>
<th>Clerkship type</th>
<th>Time spent (Minutes)</th>
<th>Scoring significance</th>
<th>Impact of student (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Pharmacy</td>
<td>9.0 ± 8.1</td>
<td>1.5 ±0.6</td>
<td>94.2 ± 11.5</td>
</tr>
<tr>
<td>Institutional Pharmacy</td>
<td>35.8 ±114.8</td>
<td>1.8 ±0.7</td>
<td>84.3 ± 21.2</td>
</tr>
<tr>
<td>Ambulatory Care</td>
<td>22.9 ± 37.2</td>
<td>1.8 ±0.7</td>
<td>90.2 ± 19.3</td>
</tr>
<tr>
<td>Adult Acute Care</td>
<td>30.8 ± 43.8</td>
<td>2.0 ±0.8</td>
<td>91.4 ± 15.3</td>
</tr>
</tbody>
</table>

* Scale ranges from -1 (adverse significance) to 3 (very significant).
* Percent of service contributed by the student.

and mode of 2 (see Appendix B for significance scale).

The data were further analyzed by isolating each clerkship site. Each clerkship type was well represented in the study and each in nearly equal numbers. Of the 27 clerkship sites in which students documented their interventions, seven each were Adult Acute Care Practice, Ambulatory Care Practice, and Community Pharmacy Practice, and six were Institutional Pharmacy Practice sites. Students completed the most forms while on Ambulatory Care Practice rotations (28.4 percent of the total) and documented the most “Reasons for services” while on Community Pharmacy Practice rotations (29.2 percent). The fewest forms and “Reasons for services” occurred at Institutional Pharmacy Practice sites. However, the Institutional Pharmacy Practice data were gathered at only six sites. The most “Professional services” (31.6 percent) were performed in the Ambulatory Care Practice setting, while the fewest occurred in the Institutional Pharmacy Practice clerkships (19.7 percent). The most common types of “Reasons for services” and “Professional services” provided for each clerkship type are listed in Table III. Students spent the least time per recommendation when making recommendations on Community Pharmacy Practice clerkships (average about nine minutes) and the most time on Institutional Pharmacy Practice clerkships (36 minutes). Students believed that their recommendations were more significant at the Adult Acute Care sites (scale average 2.0) and slightly less significant at Community Pharmacy sites (1.5). Finally, students felt they had more...
“independent” impact (94 percent student vs. six percent preceptor) at Community Pharmacy sites when compared with the others. Averages for each clerkship in these categories are listed in Table IV.

The total number of PharmD Student Service Evaluation Forms completed by each student ranged between 22 and 46 (average 33.8). Multiple items were often marked in each category on the forms. For example, one student marked ten “Reasons for Services” on a single form that described a complicated patient encounter. On the same form he also marked eight “Professional Services,” three “Recommendations,” and three “Results of Services.” In most instances, however, students marked a single item in each section. The time spent per encounter also varied among the students. One student spent an average of about eight minutes per encounter while another nearly 42 minutes per encounter. Six of the ten students, on average, felt that they contributed 90 percent or more (versus preceptor) to the impact of each encounter. Possibly the largest variation in the students’ documentation occurred in the significance scoring. On a -1 to 3 scale (Appendix B), the students’ averages ranged between 1.3 and 2.5. Data for each student in these categories are displayed in Table V. Half of the students made more recommendations in the first half of the clerkship and half made more in the second half, though the differences tended to be small. This outcome tended to hold true across clerkship types as well.

DISCUSSION
Results indicate that fourth-year PharmD students have an impact on patient care through their ability to make clinical recommendations and provide other services at the four clerkship types analyzed in this study. Although “Patient education/instruction” was the most frequent response to “Reasons for services” (20 percent of the total), Table I data suggests that the students became involved in interventions for a variety of reasons. This is an encouraging outcome from a college perspective in that it indicates students are exposed to a breadth of clinical intervention learning experiences at the clerkship sites. “Professional services” performed and documented by the students were concentrated in three categories where “Prescriber consulted,” “Medication review,” or “Patient education/instruction” accounted for nearly 70 percent of responses (Table II). This may be due, in part, to the reduced potential for students to participate in a number of the innovative categories that the form was originally designed by NCPA to document (e.g., perform laboratory test). If a pharmacy site did not provide such a service, the student would not have an opportunity to participate.

The correlation between the recommendations provided by the students and the actual results of their services is important in assessing the extent to which the students can contribute to their clerkship sites. Approximately 64 percent of the 359 recommendations correlated with “Result of service.” If the unknown or “Other” responses are excluded, over 91 percent of the students’ recommendations correlated positively with the actual “Results of services.” This percentage is comparable to reports in previous studies in which 79-95 percent of pharmacy students’ recommendations were accepted by the medical team(4,5,10).

Compared to the other clerkship types, students on Community Pharmacy Practice rotations, on average, spent the least time per encounter and scored their interventions at a lower level of significance. However, the students believed they had the most impact (versus preceptor) at Community sites. The latter may be due in part to the types of services the students are allowed to provide without close supervision once the preceptor feels comfortable with the student’s capability.

Another consideration is the time students spend on interventions compared to the overall time on clerkships. Students at the University of Arizona are generally expected to spend eight hours per day, five days per week on clerkship, or approximately 80 hours on clerkship over a two-week period. The results showed that students spent an average of about 20 minutes per encounter and documented an extrapolated average of 11.2 encounters per clerkship. Therefore, it can be estimated that the students spend almost four hours every two clerkship weeks performing actions similar to those described on the evaluation form. Students frequently have other responsibilities while on clerkships (e.g., attending patient rounds or completing assignments) that may detract from performing patient care functions. Further, they were asked to avoid documentation of “routine” pharmacist/pharmacy intern functions such as brief patient counseling on a new prescription. Instead, they were asked to only document the cases in which they made notable contributions to the patient or service. So, the small apparent amounts of time spent on notable contributions is not likely a reflection of their total contribution to the site and to patient care at the sites.

Unfortunately, it would be very difficult to accurately estimate the financial contributions of the students to the clerkship sites. The average time per encounter was approximately 20 minutes and over 90 percent (on average) of the impact was

Table V. Encounters and actions of PharmD students

<table>
<thead>
<tr>
<th>Student</th>
<th># Advanced practice exp. Documenting interventions</th>
<th># Forms completed</th>
<th>Avg. time spent per encounter (minutes)</th>
<th>Avg. impact vs. preceptor/other (%)a</th>
<th>Avg. scoring significanceb</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>31</td>
<td>41.6</td>
<td>95.7</td>
<td>1.4</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>41</td>
<td>9.0</td>
<td>83.4</td>
<td>1.4</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>42</td>
<td>35.7</td>
<td>91.3</td>
<td>2.1</td>
</tr>
<tr>
<td>D</td>
<td>3</td>
<td>30</td>
<td>29.5</td>
<td>79.0</td>
<td>1.9</td>
</tr>
<tr>
<td>E</td>
<td>3</td>
<td>46</td>
<td>13.7</td>
<td>90.7</td>
<td>1.4</td>
</tr>
<tr>
<td>F</td>
<td>2</td>
<td>35</td>
<td>18.1</td>
<td>100.0</td>
<td>1.3</td>
</tr>
<tr>
<td>G</td>
<td>3</td>
<td>36</td>
<td>11.0</td>
<td>89.7</td>
<td>1.9</td>
</tr>
<tr>
<td>H</td>
<td>3</td>
<td>30</td>
<td>21.0</td>
<td>98.0</td>
<td>2.5</td>
</tr>
<tr>
<td>I</td>
<td>3</td>
<td>22</td>
<td>21.6</td>
<td>90.0</td>
<td>2.0</td>
</tr>
<tr>
<td>J</td>
<td>2</td>
<td>25</td>
<td>8.4</td>
<td>100.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

a Percent of service contributed by the student.

b Scale ranges from -1 (adverse significance) to 3 (very significant).
attributed to the student in this study. Thus, it appears that the students did have value but this likely represents only the minimum value since it is unlikely that the students documented all their beneficial interventions. Carter and colleagues recently published algorithms for estimating learning opportunities and productivity impact at clerkship sites(11). Future studies using these algorithms may help colleges and clerkship sites determine the value each obtains from the clerkship arrangements.

Students who participated in the study were “known performers.” This is a potential limitation for extrapolating the results of this study to other students. However, the fact that the students performed well in the classroom or were perceived as reliable does not necessarily reflect superior or adequate ability as clinicians (making and correctly documenting interventions and recommendations). Also, it may not be possible to accurately extrapolate the data beyond the four clerkship types studied.

Since no documentation of patient records or information occurred in the study, a follow up via patient records that could validate the work of the students was not possible. However, the students were selected on the basis of their character and were not compensated for their efforts so falsifying or intentionally providing inaccurate data should be considered unlikely.

It is unlikely that the students reported every patient care or intervention encounter. For example, one student described the inability to document the majority of his patient care encounters during an Ambulatory Care Practice clerkship due to the enormous load of patients he saw in clinic. He estimated that he would see an average of 20-30 patients each day 3-5 days per week for clinic visits and noted that he would provide a recommendation and plan for nearly every patient. His responsibilities included a review of the patient’s chart followed by an interview (lasting 5.1 minutes on average) with each patient/caregiver in order to obtain a thorough drug history. The student would then make drug therapy recommendations, update medication lists in charts, and discuss pharmacy-related issues with the physician before he/she would see the patient. Although he documented the more pertinent interventions, he believed he made substantial contributions to approximately 70 other patients over the two-week period.

In addition to documenting contributions to the clerkship sites, the students had the opportunity to use a form that was developed for submitting payment claims. Learning to use documentation methods should likely become the norm for students on clerkships as the profession moves toward greater documentation of services, either for payment or for justification of service expansion. This study did not examine the students’ satisfaction with the use of the documentation form. However, we believe that, prior to graduation, students should be exposed to a variety of computer and paper documentation forms available for use today and in the future.

CONCLUSIONS

Through documenting clinical interventions, fourth-year students in this study demonstrated their role in patient care pharmacy functions while on clerkships. They became involved in interventions for a variety of reasons, provided numerous services, and physicians or staff accepted the majority of their recommendations. The students reported that they contributed the most to the encounters and most frequently rated their interventions as “significant.” The financial contributions of students on clerkships have yet to be sufficiently analyzed.


References


APPENDIX A: PHARMD STUDENT SERVICE EVALUATION FORM

DATE: __/__/____

NAME OF PHARMD CANDIDATE PROVIDING SERVICES:

Clerkship Course Number (circle one): PhPr 803a PhPr 803b PhPr 803c PhPr 803e

Reporting Pharmacist (clerkship preceptor):

I. REASONS FOR SERVICES

ADMINISTRATIVE
- Call Help Desk
- Drug Not Available
- Missing Information
- Clarification

ADMINISTRATIVE
- Formulary Enforcement
- Generic Production Selection
- Literature Search/Review

II. PROFESSIONAL SERVICES

III. RECOMMENDATIONS

Override - Conflict Invalid
Override - Conflict Not Significant
Do Not Dispense Drug

IV. RESULTS OF SERVICES

Filled As Is, False Positive
Filled Prescriptions As Is
Prescription Not Filled
Not Filled, Directions Clarified

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I. REASONS FOR SERVICES

- New Patient Processing
- Non-Formulary Drug
- Payer/Processor Question
- Prescription Authenticity
- Product Selection Opportunity

II. PROFESSIONAL SERVICES

- Patient Medication History
- Payer/Processor Consulted
- Therapeutic Product Interchange

PATIENT CARE

- Coordination of Care
- Dosing Evaluation/Determination
- Medication Review
- Patient Assessment
- Patient Consulted
- Patient Education/Instruction
- Patient Monitoring
- Perform Laboratory Test
- Pharmacist Consulted Other Source
- Prescriber Consulted
- Self-Care Consultation
- Other (specify in discussion)

DOsing/LIMITS

- Excessive Duration
- Insufficient Duration
- Excessive Quantity
- Insufficient Quantity
- High Dose
- Low Dose
- Overuse
- Suboptimal Dosage Form
- Suboptimal Regimen
- Underuse (Noncompliance)

DRUG CONFLICT

- Additive Toxicity
- Drug-Age Precaution
- Drug-Allergy
- Drug-Disease
- Drug-Drug Interactions
- Drug-Gender
- Drug Incompatibility
- Drug-Pregnancy
- Iatrogenic Condition
- Ingredient Duplication
- Lactation/Nursing Precaution
- Prior Adverse Drug Reaction
- Therapeutic Duplication

DISEASE MANAGEMENT

- Additional Drug Needed
- Adverse Drug Reaction
- Apparent Drug Misuse/Abuse
- Health Provider Referral
- Laboratory Test Needed
- New Disease/Diagnosis
- Patient Complaint/Symptom
- Patient Education/Instruction
- Patient Question/Concern
- Plan Protocol
- Prescriber Consultation
- Suboptimal Drug/Indication
- Unnecessary Drug
- Alcohol Precaution
- Drug-Food Interaction
- Drug-Lab Conflict
- Side Effect
- Tobacco Use Precaution
- Other (specify in discussion)

PRECAUTIONARY

- Change Regimen/Dose
- Change Therapy/Drug
- Change Drug to More Effective and more costly drug
- Change Drug to More Effective, Less Costly Drug
- Continue Without Change
- Extensive, Report Will Follow
- Refer Patient to Another Professional
- Change to OTC Product
- Other (specify in discussion)

III. RECOMMENDATIONS

- Discontinue Drug
- Discontinued Drug
- Change Regimen/Dose
- Therapy/Drug Changed
- Change Therapy/Drug
- Therapy Changed
- Change Drug to More Effective
- Drug Therapy Changed
- Extensive, Report Will Follow
- Therapy Changed Cost
- Decrease Acknowledged
- Continue Without Change
- Drug Therapy Unchanged
- Refer Patient to Another Professional
- Change to OTC Product
- S/P Ratio:_________

IV RESULTS OF SERVICES

- Discontinue Drug
- Discontinued Drug
- Change Regimen/Dose
- Therapy/Drug Changed
- Change Therapy/Drug
- Therapy Changed
- Change Drug to More Effective
- Drug Therapy Changed
- Change to OTC Product
- Other (specify in discussion)

V. AMOUNT OF TIME STUDENT SPENT PERFORMING SERVICE

Total time PharmD student spent performing the services described: ___________ minutes

VI. IMPACT OF PHARM.D STUDENT VERSUS PRECEPTOR

- PharmD Student
- Service Provided 100% by PharmD Student
- Service Ratio of the Student to Preceptor (i.e., 70/30 ratio implies that 70% of the recommendation or service was provided by the student while the preceptor was responsible or assisted approximately 30% to the service or resolution)

VII. SCORING THE LEVEL OF SERVICES PROVIDED (mark one)

-1 Adverse Recommendation may lead to adverse outcomes

0 No Recommendation is informational (not specifically related to the patient (in question)

1 Somewhat Significant Benefit of the recommendation to the patient could be neutral to slightly beneficial depending on professional interpretation

2 Significant Recommendation would bring care to a more acceptable and appropriate level

3 Very Significant Recommendation qualified by a potential or existing major organ dysfunction or a life-or-death situation

APPENDIX B. LEVEL OF RECOMMENDATION SCALE

<table>
<thead>
<tr>
<th>Score</th>
<th>Significance</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>Adverse</td>
<td>Recommendation may lead to adverse outcomes</td>
</tr>
<tr>
<td>0</td>
<td>No</td>
<td>Recommendation is informational (not specifically related to the patient (in question)</td>
</tr>
<tr>
<td>1</td>
<td>Somewhat</td>
<td>Benefit of the recommendation to the patient could be neutral to slightly beneficial depending on professional interpretation</td>
</tr>
<tr>
<td>2</td>
<td>Significant</td>
<td>Recommendation would bring care to a more acceptable and appropriate level</td>
</tr>
<tr>
<td>3</td>
<td>Very Significant</td>
<td>Recommendation qualified by a potential or existing major organ dysfunction or a life-or-death situation</td>
</tr>
</tbody>
</table>

Categories I-IV in Appendix A are based on the Pharmacist’s Care Claim Form, with permission, which is available through the National Community Pharmacy Association (NCPA).

Appendix B, Level of Recommendation Scale, is derived from Hatoum, et al (8)