

## Original Articles

# A Systematic Approach to Educating Elderly Patients About Their Medications

Ruth Ann C. Opdycke, PharmD, MS<sup>a</sup>, Frank J. Ascione, PharmD, PhD<sup>a,b</sup>,  
Leslie A. Shimp, PharmD, MS<sup>a,c</sup> and Rita I. Rosen, PharmD<sup>d</sup>

<sup>a</sup>College of Pharmacy, <sup>b</sup>Institute of Gerontology, <sup>c</sup>Department of Family Practice, Medical School, University of Michigan, Ann Arbor, Michigan 48109-1065 and <sup>d</sup>William Beaumont Hospital, Royal Oak, Michigan 48072 (USA)

(Received February 3rd, 1991)

(Accepted September 3rd, 1991)

### Abstract

*The purpose of this study was to evaluate a pharmacist-initiated, total package, patient education program based on the concepts described in the PRECEDE model. This program was directed towards 94 therapeutically complex elderly patients and consisted of a medication history, therapeutic evaluation, patient education needs assessment, patient education session, and a patient feedback/satisfaction telephone interview. Pharmacists identified on average 5.6 medication-related problems and provided an average of 6.2 recommendations. Problems commonly identified involved inadequate drug knowledge (25.5%), noncompliance (22.7%), and inappropriate drug use (17.4%). Typical recommendations included altering drug use (35.9%), improving compliance behavior (18.1%), and improving communication with health professionals (18.1%). Patient satisfaction with the education session was overwhelmingly positive. Based on the findings of this study, it is apparent that a patient education program based on the PRECEDE model can be used successfully by pharmacists to prepare education plans that would benefit the therapeutically complex elderly patient.*

**Keywords:** Elderly; Medications; Pharmacists; Patient satisfaction.

### Introduction

Approximately 40–45% of elderly patients do not take their prescribed medications properly [1]. Many strategies have been proposed to educate elderly patients about their medications, but the evidence suggests that no single strategy is superior to another nor is any one approach effective for all patients [2–5].

Mullen and Green have suggested that in order to improve the design of patient education programs and studies, a more thorough explanation of the theory, rationale, and process by which interventions are selected, adapted, or tailored for specific groups of patients should be considered [6]. Similarly, Stanton asserts that to provide patient education programs of high quality, an instructional technology approach in which activities of assessing learning needs, specifying goals and objectives, delineating content, strategies, and resources, and finally evaluating the program are essential components [7]. The focus on a total package concept with an instructional technology approach has been used for specialized patient populations [7,8]. However, this approach is infrequently utilized by pharmacists for ambulatory elderly patients

at risk for medication-related problems [3–5,9,10].

One approach that incorporates some of the facets of instructional technology is the PRECEDE model. The PRECEDE model, which stands for Predisposing, Reinforcing, and Enabling Causes in Educational Diagnosis and Evaluation, is used primarily as a framework for health education planning [11]. Predisposing factors include the patient's knowledge, attitudes, values, and perceptions about their illness or therapy. Enabling factors include the availability of resources, accessibility of services, and the skills the patient possesses. Reinforcing factors include attitudes and behaviors of health practitioners, peers, family, and employers. The model synthesizes educational, behavioral science, and epidemiological theory and outlines the steps that should be followed to plan health education programs. Assessments are made in the context of educational needs and are ranked in order of importance, and a strategy or set of strategies is identified which would positively influence the predisposing, reinforcing and enabling factors.

It was the intent of this study to examine how pharmacists provide patient education services to the elderly using a more structured, total package approach based on the PRECEDE model of patient education. Specifically, the study had the following objectives:

(1) To determine the types of patient education problems pharmacists identified using a structured assessment of elderly patients' medications and medication-related behaviors.

(2) To determine the kinds of recommendations and patient education tools pharmacists chose for elderly patients.

(3) To assess patients' opinions of the value of the pharmacist's recommendations and the structured patient education approach.

## Methods

### *Subjects*

The elderly subjects described within this report were participants in the Focused Drug Therapy Review Program conducted by the University of Michigan College of Pharmacy and Institute of Gerontology [12]. The aim of the Focused Drug Therapy Review Program was to use a systematic approach to alter prescriber and patient behavior in order to optimize medication use in therapeutically complex elderly patients, those with an increased risk of experiencing medication-related problems. The study inclusion criteria included: (1) age 60 and over; (2) use of four or more prescription medications; (3) the presence of at least two chronic medical problems; (4) under the care of one primary physician participating in the study; (5) noninstitutionalized; (6) responsible for taking their own medication; and (7) the patient planned to visit their physician within the next 2 months. The elderly patients were randomly selected based on record reviews from three family medicine practices and a geriatric clinic. The pool of patients was stratified by practice site in order to ensure adequate representation from each site.

Nine pharmacists participated in the research project. Two of the pharmacists were consultants to the medical practices from which the patient sample was selected: one at the geriatric clinic, and the other at one of the family medicine practices. Three of the pharmacists were practicing community pharmacists, and the remaining four were members of the project research staff. Eight of the nine pharmacists had Doctor of Pharmacy degrees.

### *Assessing learning needs*

The initial assessment process included patient-specific data collection via a structured, in-depth, medication history using a previously tested document [13]. In the

PRECEDE model this step includes identifying the predisposing, reinforcing and enabling factors that affect elderly patients' use of medications. Specifically, the participants were questioned about their use of prescription and nonprescription medications including knowledge of medication purpose, attitudes about medication use, scheduling, use of reminder aids, difficulty with medication administration, presence of symptoms of possible adverse drug reactions, use of social drugs and home remedies, access to health professionals, estimation of and reason for noncompliance if present, and financial burden of therapy. An outline of the contents of the medication history is included in Appendix A. Patients scheduled appointments with the pharmacists to initiate the assessment process. After the interviews were completed, clinical pharmacists evaluated the drug therapy regimens using a standardized protocol. The aim was to identify medication problems that could be addressed to the physicians in the format of a written consultation or at a later time to the patients during the patient education session. After the physicians responded to the consultation letters, the pharmacists began the process of establishing educational plans. In the PRECEDE Model this step includes specifying goals and objectives and delineating content.

The planning for the patient education session was done via a Patient Education Assessment Form. This document provided a series of protocols which extracted and organized information from the medication history, drug therapy evaluation, and the physician's response to recommendations contained in the consultation letter. The Patient Education Assessment Form was constructed to lead the pharmacists through an assessment of each of the patients' problems, an identification process for objectives designed to correct the problems, selection of strategies and tools to aid patients in correcting the problems, and

organization of data which would lead to specific recommendations given to the patients in rank order of their importance. Predisposing factors which may cause patients to make mistakes in taking their medications made up the five main sections of the form: noncompliance, inappropriate medication use, inadequate medication knowledge, inadequate communication with health professionals, and miscellaneous medication related problems. An outline of the content of the Patient Education Assessment Form is given in Appendix B.

#### *Patient education tools*

Once the patients' educational needs were identified, potential patient education tools were selected to enable patients to alter their medication use behaviors. The tools had one of the following objectives: information transfer, improving medication compliance, or enhancing communication with health professionals. Information transfer tools included the use of oral or written information such as the USP Book, *About Your Medicines* [14] or medication information sheets prepared by the USP [15]. All patients received a copy of *About Your Medicines* for their participation in the project. Tools to improve patient compliance consisted of behavior aids such as a medication reminder package or calendar. Tools that were used to enhance communication with health care professionals included a wallet medication card, a medication information booklet entitled, *Passport to Good Health*, and a list of questions to ask the physician at the next visit.

#### *Preparing a plan with the patient*

The above tools and strategies, singly and in combination, were used in a one-time pharmacist-patient education session. The pharmacists contacted the patients and arranged a convenient time and place for the patient education session. In most cases, the education sessions took place in a private

counseling room at the medical clinic or pharmacy; some home visits were also arranged. The act of scheduling an appointment for the patient education session reinforced the importance of the meeting. All recommendations provided to the patients during the patient education session were provided in a written format and verbally reinforced in order to avoid overloading the patients with information.

#### *Patients' evaluation of the process*

Patient feedback about the education program was collected via a telephone survey of the subjects approximately 6 months after the patient education session. The questionnaire contained two components, questions regarding reaction to the pharmacists' recommendations and corresponding patient education tools and questions regarding satisfaction with participation in the program.

Questions regarding reaction to the pharmacists' recommendations were intended to determine if the patients recalled the pharmacists' recommendations, whether they tried to follow the advice given, and an assessment of the utility of the recommendations. The patients were specifically questioned about recommendations that they received during the education session. One recommendation from each of three categories of recommendation types was selected for assessment. The categories included: (1) recommendations to alter medication use; (2) recommendations to improve compliance behavior or methods to combat side effects; and (3) miscellaneous recommendations regarding potential medication side effects or general medication information. A patient was not questioned about a category if there were no representative recommendations from that category provided during the education session.

The utility of the patient education tools was assessed by asking the patient to rate the usefulness of the tools on a 5 point scale with 1 indicating not very useful and 5 very useful. Only those patients receiving patient education tools were asked this question.

The patients' personal assessments of the program were examined using a patient satisfaction questionnaire adapted from the well-established patient satisfaction questionnaire developed by Ware et al. [16]. McKeigan and Larson [17] recently modified Ware's questionnaire to assess satisfaction with traditional pharmacy dispensing services. Ware and his colleagues identified eight major dimensions of patient satisfaction with medical care. The dimensions include interpersonal quality of care, technical quality, accessibility/convenience, finances, efficacy/outcomes, continuity, physical environment, and availability. Based on the interventions used in the study patient education program, four of the dimensions (e.g., interpersonal quality of care, technical quality, accessibility/convenience, and efficacy/outcomes), could be evaluated in this study.

Twenty Likert-type statements of opinion representing the four selected dimensions of patient satisfaction described by Ware et al. [16] were created by modifying questions in the Ware questionnaire. Summated rating scales were used to represent each of the four dimensions with a summation of all 20 items representing an overall satisfaction dimension. A five-point response scale on a strongly disagree/strongly agree continuum was used. The items focused on the individual's personal experience with the program rather than on the experience of people in general. When possible, the various dimensions were balanced with respect to the number of favorably and unfavorably worded items. The questionnaire was reviewed for content validity and clarity of items by two college of pharmacy faculty members and other members of the research staff. A pretest on a sample of 10 patients indicated that no major revisions of the document were necessary. Appendix C contains the patient satisfaction questionnaire items.

#### *Evaluation of pharmacists' use of patient education assessment form*

Differences in the pharmacists' approach to

educating older patients were evaluated retrospectively by reviewing the pharmacists' educational plans outlined in the Patient Education Assessment Forms. Information was divided into broad categories referred to as medication related problems, objectives, strategies/tools, and recommendations. The pharmacists' behaviors were categorized by the type of problems they identified and how they resolved them. Thus, each pharmacist's assessment form was examined to determine what objectives they chose for the same problems, what tools were suggested, and what types of recommendations were given. The examination was performed by a member of the research staff who did not participate in the patient education program. The pharmacists who completed the assessment forms were unaware that their information would be reviewed at a later date.

## Results

### *Population characteristics*

Of the 180 patients entering the Focused Drug Therapy Review project, 94 were randomly allocated to the experimental group which included the patient education session [12]. Of the 94 consultation letters mailed to the physicians, 87 physician response forms were received (93% response rate). Only those patients whose physicians returned a response form were eligible to participate in the education session with the pharmacist. Of the 87 eligible, 70 participated in the patient education session (80% participation rate). The final intervention in the study was the telephone survey to obtain the patient's feedback about the value of the program. Of the 70 patients eligible for the telephone survey, 59 patients actually responded to the survey (84% response rate). Although no predominant reason was noted for drop out ( $N = 35$ ) during any of the phases of the study, some of the reasons noted were failure to return to the clinic during the study period, hospitalization, failure to remember the patient education session, or vacation. Comparison of the demographic characteristics of the individuals

completing the entire patient education ( $N = 59$ ) versus those individuals lost to follow-up at various points in the program ( $N = 35$ ) indicated no significant differences.

As indicated in Table 1, the study sample was predominantly elderly, Caucasian, and female. The patients also were likely to live with their spouse or other relative, to be educated beyond the eighth grade and have an annual income over \$10 000. In addition, the subjects were using a large number of medications, averaging 11 per patient.

Medication histories were completed by nine different pharmacists, five of whom also participated in the patient education needs assessments and education sessions. Table 2 illustrates the time spent by the pharmacists on each phase of the program. Actual patient-pharmacist contact occurred during the history and patient education session and averaged a total of 81 min.

### *Identification of patient education problems*

Table 3 describes the numbers and types of patient education problems identified in this group of elderly patients. Inadequate medication knowledge and issues of compliance were the most common problems identified. Figure 1 depicts the distribution of the number of problems identified per patient. All patients participating in the education session had at least one medication-related problem. The median number of problems identified was 6.0 with an average of  $5.6 \pm 2.3$  problems. The total number of medication-related problems ranged from 1 to 13. Four of the five pharmacists identified similar numbers of problems per patient (approximately 6 problems per patient) while one pharmacist identified on average 3.4 problems per patient.

### *Pharmacists' recommendations*

The types of recommendations provided to the study patients are contained in Table 3. The most common recommendation was to alter medication use (e.g., changing the product used, the administration time, or dose ingested). Recommendations to improve

**Table 1. Patient education session: sample characteristics.**

Characteristic	<i>N</i>	Average	Percent <sup>a</sup>	Range	SD
Age	70	75.5		61–94	8.2
Sex					
Male	24		34.2		
Female	46		65.8		
Race					
White	68		97.1		
Black	2		2.9		
Living arrangement					
Spouse/other relative	47		67.1		
Alone	23		32.9		
Education					
Eighth grade or less	10		14.3		
Ninth–twelfth grade	32		45.7		
Some college	12		17.1		
College graduate	16		22.9		
Annual income <sup>b</sup>					
Less than \$10 000	18		28.6		
\$10 001–\$20 000	25		39.7		
Greater than \$20 000	20		31.7		
Site					
Family practice 1	11		15.7		
Family practice 2	13		18.6		
Family practice 3	21		30.0		
Geriatric clinic	25		35.7		
Medication type					
Prescription		6.0		2–15	2.9
Nonprescription		3.5		0–9	2.1
Vitamins		1.5		0–8	1.9
Total medications used		11.0		3–26	4.6

<sup>a</sup>Based on 70 patients in the patient education program.

<sup>b</sup>Less than 70 patients responded to this question.

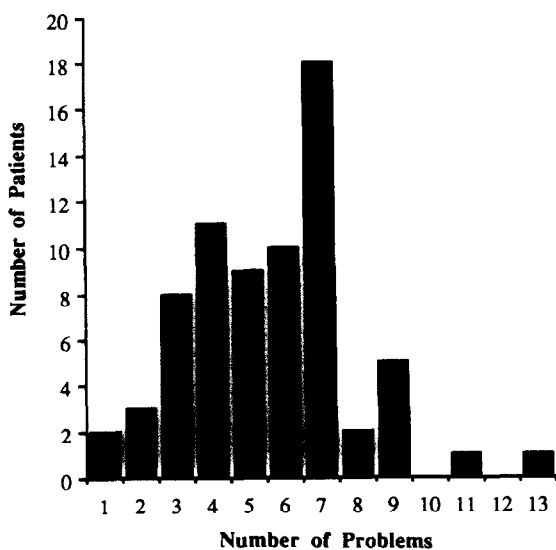
**Table 2. Time requirements of interventions.**

Phase of intervention	Average time (min)	SD
Medication history	55.7	17.2
Drug therapy review and consultation letter to physician	121.3	48.1
Completion of the Patient Education Assessment Form	30.9	10.4
Patient education session	25.4	11.0
Feedback/satisfaction telephone survey	16.5	4.5

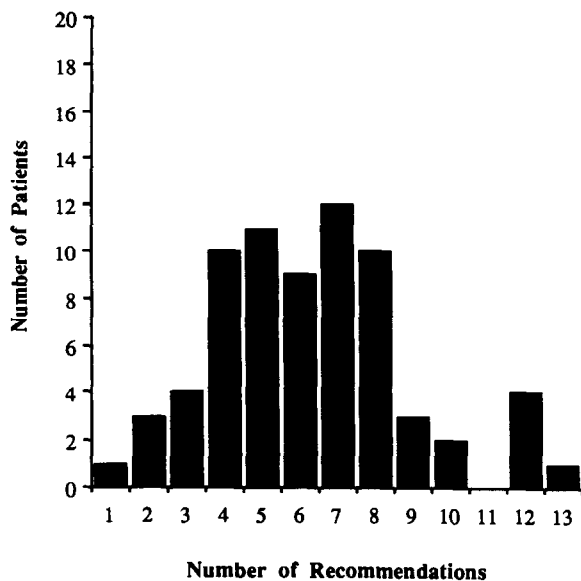
**Table 3. Patient Education Assessment Form: problem identification and recommendations generated by the pharmacists.**

Activity	N	Percent
<b>Types of problems identified</b>		
Inadequate medication knowledge	100	25.5
Noncompliance	89	22.7
Inappropriate medication use	68	17.4
Inadequate communication with health professionals	49	12.5
Miscellaneous medication related problems	86	21.9
Total problems identified	392	
<b>Types of recommendations</b>		
Alter medication use	157	35.9
Improve compliance behavior	79	18.1
Improve communication with health professional	79	18.1
Medication precaution or side effect	51	11.7
Miscellaneous medication information	38	8.7
Miscellaneous behavioral changes	16	3.7
Miscellaneous information	17	3.8
Total recommendations given	437	

<sup>a</sup>Based on 70 patients in the patient education program.

**Fig. 1. Distribution of medication-related problems.**

compliance behavior, such as information on linking administration times with daily activities and provision of reminder aids, were also fairly common. Figure 2 contains the distribution of the number of recommendations provided to the study patients. All patients participating in the education session were provided with at least one recommendation by the pharmacists. The median number of recommendations provided to the patients was 6.0 with an average of  $6.2 \pm 2.6$  recommendations. The total number of recommendations ranged from 1 to 13. The four pharmacists who identified on average more problems per patient also provided, on average, more recommendations per patient than did the other pharmacist. Additional analysis indicated however that the distribu-

**Fig. 2. Distribution of recommendations.**

tion of the specific types of recommendations given by the individual pharmacists was similar.

Analysis of the recommendation rank-ordering process by the pharmacists revealed some general trends. Ranking of the recommendations indicated their relative importance. The more highly ranked a recommendation, the greater the perceived importance to the patient. The pharmacists tended to rank the recommendation to alter drug use as the highest priority; recommendations to improve compliance were ranked the next highest priority. The ranking of recommendations

past these first two was not consistent among the pharmacists. In general, for those patients who had difficulty assimilating new information, only the 1–3 most highly ranked recommendations were provided during the education session.

#### *Use of patient education tools*

Patient education tools were used for 43 of the 70 patients participating in the patient education session, with 20 of those individuals receiving multiple tools. Of those patient education tools given to the patient, the tools with the objective of enhancing communication with health professionals, such as the wallet card and the Passport to Good Health, were the most popular (see Table 4). Although all patients received a copy of *About Your Medicines*, it was not always used as a tool during the patient education session.

#### *Patients' evaluation of the process*

Patients were contacted by telephone on average 6 months after the education session ( $6 \pm 2$  months) to assess their satisfaction with the interventions. In general, patient response to the entire intervention was overwhelmingly positive, with 51 of the 59 patients (96%) responding to the telephone survey indicating that they would participate in such a patient education project again.

Table 5 lists the descriptive statistics for each dimension of patient satisfaction measured. The overall satisfaction with the

**Table 4. Enabling factors: patient education tools used during the education session.**

Tool	Objective	N	Percent <sup>a</sup>
Wallet card	Communication	26	31.7
Passport to Good Health	Communication	20	24.4
<i>About Your Medicines</i> Book	Information transfer	17	20.7
Medication reminder package	Compliance	13	15.9
Medication information sheets	Information transfer	5	6.1
Written questions to ask physician at next meeting	Communication	1	1.2

<sup>a</sup>Based on the use of 82 patient education tools.



**Table 5. Patient satisfaction.**

Dimension of patient satisfaction	Number of questions	Average <sup>a,b</sup>	SD
Interpersonal quality	7	4.8	0.31
Technical quality	5	4.5	0.55
Accessibility/convenience	2	4.4	0.91
Efficacy/outcomes	6	3.9	0.85
Overall satisfaction	20	4.4	0.45

<sup>a</sup>Based on a scale of 1–5, with 5 being completely satisfied.

<sup>b</sup>Based on a total of 59 patients responding to the patient satisfaction telephone survey.

program was rated highly with an average rating of 4.4 on a scale of 1 to 5 with 5 being completely satisfied. Patients were most satisfied with the interpersonal quality of the study pharmacists with an average satisfaction rating of 4.8. The dimensions of technical quality and accessibility/convenience were also rated highly by the patients with average satisfaction ratings of 4.5 and 4.4, respectively. Patients were least satisfied with the satisfaction dimension of efficacy and outcome with an average satisfaction rating of only 3.9. An underlying efficacy and outcome goal of the patient education session was to encourage the participant to take a more active role in their own health care by improving their desire and ability to gain knowledge about the use of medications. With a satisfaction rating of 3.9 for the efficacy and outcome dimension, it appears that this goal was not entirely appreciated by the patients.

When questioned specifically about the pharmacists' recommendations to alter their medication use, 41 of the 51 patients (82%) receiving recommendations in this category were able to recall the recommendations and 76% of those patients ( $N = 31$ ) tried to follow the advice. Most of the patients found the recommendations fairly easy to implement. The patients who attempted to alter medication use found the recommendations useful for several reasons including reduction in

complexity of the medication regimen, elimination of a medication side effect, discontinuation of unnecessary medications, or improving medication compliance.

A total of 29 patients responding to the telephone survey received recommendations in the category of recommendations to improve compliance behavior or methods to combat side effects. When questioned specifically about the recommendations, 23 of the patients (79%) were able to recall the recommendations with the majority (80%) of the patients finding these recommendations very useful. Likewise, 35 patients responding to the telephone survey received recommendations in the category of miscellaneous recommendations regarding potential medication side effects or general medication information. A total of 28 of these patients (80%) were able to recall the recommendations with a majority of the patients (83%) finding these recommendations very useful.

The utility of the various education tools was also assessed. The tool which received the highest average rating of utility from the patients was the *About Your Medicines* book which averaged a rating of 4.1 on a scale from 1 to 5 with 5 being the most useful. The reactions to the medication reminder package and *Passport to Good Health* were not as positive, but these tools were found to be somewhat

useful with average ratings of 3.8 and 3.7, respectively. The patients did not find the wallet card to be of much immediate use with an average utility rating of only 2.5. However, this concise, portable medication profile is intended to be of greater use to the various health professionals involved in the patient's care.

## Discussion

The objective of this research was to determine how pharmacists would provide patient education services to the elderly using a more structured, total package approach based on the concepts of the PRECEDE model. This theoretically based approach to patient education is not typically used by pharmacists. Based on the findings of this study, it is apparent that the model can be used successfully by pharmacists to prepare patient education plans to potentially benefit therapeutically complex elderly patients.

The completion of a comprehensive medication history and the utilization of the information collected by the pharmacists demonstrates the value of a complete assessment of patient factors which can predispose patients to mismanage their medications. The standardized assessment format established for this study allows for a comprehensive identification of potential patient education problems. Recommendations to resolve these problems were also systematically developed and provided to patients in rank-order of importance in order to avoid information overload.

### *Comparison with other pharmacist-run patient education studies*

Although the pharmacist's role in educating the elderly patient is supported by a number of organizations [18–22], the various pharmacy associations' professional standards provide diverse statements as to the expectations and extent of the activity [23]. Few associations have in fact, embraced the

total package concept of patient education utilized in this study. Consumer surveys indicate that pharmacists often do not provide optimal patient education services [24–26]. Pharmacy based education programs rarely contain the essential components of assessing patient learning needs, specifying goals and objectives, delineating content, strategies and resources, and finally, program evaluation. Rather, pharmacist patient education efforts are based on a brief needs assessment of one particular medication (e.g., name of medication, strength, directions, possible adverse effects, and storage requirements) as opposed to the more thorough assessment of the patient's complete drug therapy as described within this report.

In a search of the literature prior to 1984, Green et al. were able to find only ten published studies designed to test strategies to reduce medication errors in the elderly [3]. Only one of the ten studies was a pharmacist-based patient education intervention [27]. In a study of 53 elderly patients referred to a day hospital, Wandless et al. reported that there was no evidence to support the hypothesis that patients counseled by a pharmacist would exhibit improved compliance [27]. In contrast to the methodology of our study, there was no effort by the pharmacist to systematically identify and address patient needs beyond a mere understanding of dosage instructions.

Four other reports in the literature describe patient education programs geared towards the ambulatory elderly patient in which pharmacists play a role [4,5,9,10]. Hammarlund et al. [4] reported on the effects of pharmacist consultation on the medication use behaviors of 39 elderly patients participating in a multidisciplinary comprehensive health care project. As compared to the study described within this report, the patients in the Hammarlund study consumed fewer prescription medications (3.7 vs. 6.0) and had fewer medication-related problems (105 problems identified in 39 patients vs. 392 problems identified in the 70 patients in our study).

Over a 3-year period, the authors indicated that pharmacist counseling facilitated a statistically significant drop from 105 to 64 medication behavior problems (representing a 39% decrease,  $P < 0.001$ , one-tailed). However, because the medication counseling was part of a multidisciplinary community based comprehensive care project, it is difficult to attribute the success entirely to the pharmacists' interventions. While the authors described the method of identifying medication behavior problems, there was no apparent effort to plan a structured patient education session which would address the problems in rank-order of importance. In addition, patient reaction to the pharmacist interventions was not reported.

The effectiveness of four educational methods in improving compliance was studied in the patient education report described by Lundin et al. [5]. The educational methods included oral instruction only, written information only, both oral and written information, and both oral and written information plus memory aids. In addition, a control group received no educational intervention. The pharmacist was only involved in the preparation of the medication information materials for the patient education session and did not interact with the patient. A nurse was the individual responsible for preparing the education plan and teaching the elderly participants. There was no differences in compliance behavior observed between and among the groups. The authors did not report the number or types of medication-related problems identified by the nurse nor did they assess patient satisfaction.

The medication monitoring service described in Gehres report was run solely by a pharmacist [9]. However, the emphasis of the study was to assess the impact on eight different elderly patients' compliance behavior when a pharmacist visited the patients at home to provide medications in weekly reminder trays and counseling. Overall, the compliance of the eight patients did not change

after 6 months participation in the program. The medication monitoring service in Gehres' report included no effort to systematically identify and address medication related problems as reported herein, and there was no assessment of patient reaction to the program.

An important basis for our approach was the study done by Ascione and Shimp [10] which compared the effectiveness of four educational methods in a sample of 158 elderly patients. The objective was to improve medication knowledge, attitudes toward compliance, and compliance behavior. Patients were randomly assigned to one of four standardized interventions: oral instructions alone or in combination with written information; a medication reminder calendar; or a medication reminder package. None of the interventions was completely effective in improving all measures of medication knowledge and compliance. However, oral information was most effective in improving knowledge, and the medication reminder package was effective in improving compliance. Nevertheless, the fact that none of the interventions was successful in improving all of the study objectives underlined the importance of designing a patient education strategy in which patient needs are assessed.

#### *Patient satisfaction*

Research on patient satisfaction with traditional medical services indicates that such information does have a role in evaluating the quality of health care and explaining health related behaviors such as compliance and switching physicians [28]. Although satisfaction ratings are sometimes criticized because they do not correspond perfectly with objective reality or with perceptions of providers or administrators of care, this is their unique strength. Patient satisfaction ratings reflect both what happens to the patient and the patient's personal experience and evaluation of what happens. After all, it is the patient who is the recipient of care.

Research which focuses on patient satisfac-

tion with pharmacy services is a relatively new area. Ware's patient satisfaction questionnaire [16] has been recently modified for pharmacy practice by MacKeigan and Larson [17]. However, the MacKeigan and Larson satisfaction questionnaire was developed for traditional pharmacy dispensing services provided to ambulatory patients and was tested on a convenience sample of individuals attending family practice clinics. The satisfaction questionnaire used in this study was intended to assess patient satisfaction with the performance of the pharmacists and the specific interventions in the education session. There is currently no comparable pharmacist-based patient education program for elderly patients described in the literature nor a companion patient satisfaction questionnaire. Hence, by adapting a patient satisfaction questionnaire with well established reliability and validity such as the Ware questionnaire [16], it was believed that a more rigorous and comprehensive measure of the patients' assessment of the interventions was obtained. As indicated by the summated overall satisfaction score (4.4), the patients participating in the entire program were very satisfied with the services rendered.

There are a number of characteristics of the study which may restrict the extent that the findings may be generalized to other settings. First, the patients in the study were taking a large number of medications. It has been shown that the strongest predictor of the total number of potential medication-related problems is the number of prescription medications used [13]. Thus, the patients in this study were ideal candidates for a thorough assessment of patient education needs and recommendations to improve medication taking behaviors. Second, the pharmacists used in the study were highly trained individuals with expertise in geriatrics. It is possible that they may have identified a different set of medication-related problems than pharmacists with a more general background. In addition, the medication histories and patient

education programs were provided separate from the prescription dispensing activities typically encountered in community pharmacies. Without additional support staff, private counseling areas, a source of funding, and adequate training, it would be very difficult for pharmacists practicing in the com-

**Table 6. Implications for practice.**

---

Pharmacist-initiated patient education programs for the elderly should consist of a systematic approach containing the following components:

1. Assessing learning needs
    - Initial data collection via indepth medication history
    - An appointment system should be used to allow sufficient time to collect the necessary medication information
  2. Specifying goals and objectives
    - Five general areas which may predispose patients to make mistakes in taking their medications should be assessed: noncompliance, inappropriate medication use, inadequate medication knowledge, inadequate communication with health professionals, and other miscellaneous medication related issues
    - Patient education goals and objectives should be identified based on specific patient needs and physician input
  3. Delineating content, strategies and resources
    - The content and strategies of the patient education plans should focus on patient-specific enabling factors
    - Recommendations given to the patient during the patient education session should be provided in written format in rank order of importance
    - An appointment system should be used to allow enough time for proper discussion of the patient's educational needs
    - Education sessions should be performed in a private setting
  4. Program evaluation
    - Patient feedback about both specific recommendations provided by the pharmacist and about the program in general should be obtained
-

munity setting to provide the level of services described within this report. However, this goal is not unrealistic.

Although the study results suggested that the interventions were successful, additional research needs to be performed which examines the impact of multiple patient-pharmacist education sessions. This would provide an ongoing feedback process between the patient, pharmacist, and ultimately, the physician. In addition, more effective measures of compliance, improvement in patient knowledge, and health outcomes are needed to fully investigate the impact of the structured patient education sessions. Another area that needs to be addressed in future efforts includes an assessment of the cost of providing such an intensive patient education program and the potential cost savings by identifying and eliminating medication-related problems in the elderly patient.

### Summary

The success of this total package approach to patient education can have significant implications for the elderly patient and those individuals involved in their health care. First, the physician is assisted in the often difficult task of assessing compliance and optimizing medication use in the therapeutically complex elderly patient. By creating an independent data base via the medication history, the pharmacist is able to identify all sources of medical care and medication use, both prescribed and nonprescribed. The potential impact of the study results on the practice of ambulatory care pharmacy could be significant. The structured, thorough approach to patient education outlined in this report could allow a clinically oriented pharmacist working in the community to become part of the health care team caring for the therapeutically complex elderly patient. In addition, the elderly patient taking a large number of medications will benefit greatly from the individualized approach to his or her health care.

### Acknowledgment

This paper was supported in part by a grant from the AARP Andrus Foundation. A special thanks is also extended to the elderly patients participating in this project.

### References

- 1 Morrow D, Leiver V, Sheikh J: Adherence and medication instructions review and recommendations. *J Am Geriatr Soc* 1988; 36: 1147-1160.
- 2 Haynes RB, Wang E, Gomes MDM: A critical review of interventions to improve compliance with prescribed medications. *Patient Educ Couns* 1987; 10: 155-166.
- 3 Green LW, Mullen PD, Stainbrook GL: Programs to reduce drug errors in the elderly: direct and indirect evidence from patient education. *J Geriatr Drug Ther* 1986; 1: 3-18.
- 4 Hammarlund ER, Ostrom JR, Kethley AJ: The effects of drug counseling and other educational strategies on drug utilization of the elderly. *Med Care* 1985; 23: 165-170.
- 5 Lundin DV, Eros PA, Melloh J, Sands JE: Education of independent elderly in the responsible use of prescription medications. *Drug Intell Clin Pharm* 1980; 14: 335-342.
- 6 Mullen PD, Green LW: *Measuring Patient Drug Information Transfer: An Assessment of the Literature*. Washington, DC: Pharmaceutical Manufacturers Association, 1984.
- 7 Stanton MP: An instructional technology for patient education. *Patient Educ Couns Health Educ* 1983; 4: 208-214.
- 8 Haynes RB, Sackett DL, Gibson ES et al: Improvement of medication compliance in uncontrolled hypertension. *Lancet* 1976; i: 1265-1268.
- 9 Gehres RW: A medication monitoring service for elderly patients offered by the pharmacist on a fee-for-service basis. *J Geriatr Drug Ther* 1986; 1: 81-89.
- 10 Ascione FJ, Shimp LA: The effectiveness of four education strategies in the elderly. *Drug Intell Clin Pharm* 1984; 18: 926-931.
- 11 Squyres WD: *Patient Education and Health Promotion in Medical Care*. Palo Alto, CA: Mayfield, 1985.
- 12 Ascione FJ, Shimp LA: Focused drug therapy reviews as a means of reducing drug-related problems in the elderly patient. A report to the AARP Andrus Foundation. Ann Arbor: University of Michigan, 1989.
- 13 Shimp LA, Ascione FJ, Glazer HM, Atwood BF: Potential medication-related problems in noninstitutionalized elderly. *Drug Intell Clin Pharm* 1985; 19: 766-772.
- 14 United States Pharmacopeial Convention: *About Your Medications*. Rockville, MD: USPC, 1986.
- 15 United States Pharmacopeial Convention: *Patient Medication Information Leaflets*. Rockville, MD: USPC, 1988.
- 16 Ware J, Snyder M, Wright W, Davies A: Defining and measuring patient satisfaction with medical care. *Eval Program Plann* 1983; 6: 247-263.

- 17 MacKeigan L, Larson L: Development and validation of an instrument to measure patient satisfaction with pharmacy services. *Med Care* 1989; 27: 522-536.
- 18 Surgeon General's workshop on health promotion and aging: summary recommendations of the medication working group. *JAMA* 1989; 262: 1755-1756.
- 19 Medication for the elderly. A report of the Royal College of Physicians. *J R Coll Phys London* 1984; 18: 7-17.
- 20 American Pharmaceutical Association: The year in review. *Am Pharm* 1990; NS30: 29-36.
- 21 Mann HJ, Steiner JF, Willett MS: Drug use in the elderly. A position statement of the American College of Clinical Pharmacy. *Pharmacotherapy* 1988; 8: 355-358.
- 22 Bloom MZ: Inspector General's report advocates tearing down barriers to counseling. Clinical pharmacy services improve patient care and reduce costs. *Am Pharm* 1990; NS30: 205-206.
- 23 Smith DL: Patient Compliance: An Educational Mandate. Norwich, NY: Norwich Eaton Pharmaceuticals, Inc., and McLean, VA: Consumer Health Information Corporation, 1989.
- 24 Prescription Drugs: A Survey of Consumer Use, Attitudes and Behavior. Washington, DC: AARP, 1984.
- 25 Moore SR, Kalu M, Yavaprabbas S: Receipt of prescription drug information by the elderly. *Drug Intell Clin Pharm* 1983; 17: 920-923.
- 26 Mickle TR, Self TH, Farr GE et al: Evaluation of pharmacists' practice in patient education when dispensing a metered-dose inhaler. *DICP Ann Pharmacother* 1990; 24: 927-930.
- 27 Wandless I, Whitmore J: The effect of counseling by a pharmacist on drug compliance in elderly patients. *J Clin Hosp Pharm* 1981; 6: 51-56.
- 28 Pascoe GC: Patient satisfaction in primary health care: a literature review and analysis. *Eval Program Plann* 1983; 6: 185-210.

**Correspondence to:**

**R.A.C. Opdycke**  
**College of Pharmacy**  
**University of Michigan**  
**Ann Arbor**  
**MI 48109-1065, USA**

## Appendix A: Contents of medication history<sup>a</sup>

- I. Prescription medication information
  - A. Medication name, strength and dosage form
  - B. Prescription label directions
  - C. Patient deviations from label directions
  - D. Reasons for deviations from label directions
  - E. Duration of use of medication
  - F. Patient knowledge of medication purpose
- II. Medical problems requiring a trial of several different medications
- III. Schedule of daily activities and relation to medication administration
- IV. Use of nonprescription medications
  - A. Name of product used to treat any of 12 conditions commonly self-treated
  - B. Frequency of use
  - C. Estimate of efficacy of nonprescription products
- V. Use of home remedies
- VI. Medication allergies and intolerances
- VII. Use of multiple prescribers
- VIII. Use of multiple pharmacies
- IX. Storage of medications
- X. Compliance behaviour
  - A. Self-assessment
  - B. Use of compliance aids
- XI. Attitude towards use of medications
- XII. Sensory limitations (e.g., vision, hearing, swallowing, dexterity)
- XIII. Difficulty with medication administration of demanding dosage forms
- XIV. Presence of symptoms of possible adverse drug reactions
- XV. Use of social drugs
- XVI. Financial concerns with the cost of medications
- XVII. General demographic questions
- XVIII. Patient questions or concerns

---

<sup>a</sup>The medication history contains a total of 69 questions on 24 pages.

## Appendix B: Contents of Patient Education Assessment Form<sup>a</sup>

- I. Problem: Noncompliance
  - A. Assessment
    1. Patient exhibits sporadic noncompliance
    2. Patient deviates from medication label directions
    3. Patient fails to fill or refill a prescription
  - B. Objective: Reduce risk factors for noncompliance
  - C. Potential strategies and tools to achieve objective
    1. Modify medication regimen to link with daily activities
    2. Provide medication reminder aids
    3. Discontinue unnecessary medications
    4. Address other possible causes of noncompliance

- II. Problem: Inappropriate medication use
  - A. Assessment
    - 1. Patient inappropriately uses nonprescription products
    - 2. Patient inappropriately uses prescription medications
    - 3. Patient inappropriately uses home remedies
    - 4. Patient inappropriately uses social drugs
  - B. Objective: Reduce inappropriate medications use
  - C. Potential strategies and tools to achieve objective
    - 1. Recommend alternative nonprescription products and/or pattern of use
    - 2. Educate patient regarding appropriate use of prescription medications
    - 3. Recommend patient seek medical care for condition requiring regular use of a prescription medication
    - 4. Educate patient regarding inappropriate use of home remedies and social drugs
- III. Problem: Inadequate medication knowledge
  - A. Assessment
    - 1. Patient does not know how to use medication appropriately
    - 2. Patient does not know the purpose of medications
    - 3. Patient does not know potential signs and symptoms of an adverse drug reaction nor what to do if they occur
    - 4. Patient has problems with special dosage forms
  - B. Objective: Improve patient knowledge/skills
  - C. Potential strategies and tools to achieve objective
    - 1. Provide verbal information regarding medications
    - 2. Provide written USP medication information sheets
    - 3. Instruct patient to read appropriate section in *About Your Medicines* book by USP
    - 4. Discuss and demonstrate administration techniques
- IV. Problem: Inadequate communication with health professionals
  - A. Assessment
    - 1. Patient receives medications from several different prescribers
    - 2. Patient obtains medications from several different pharmacies
    - 3. Patient has uncorrected sensory limitations (e.g., vision, hearing) which may affect communication with health care providers
  - B. Objective: Improve communication with health professionals
  - C. Potential strategies and tools to achieve objective
    - 1. Encourage discussions with health professionals
    - 2. Encourage patient to inform health professionals of sensory limitations and need for large print or clear, audible instructions
    - 3. Provide a list of questions that the patient should ask the physician at the next visit
    - 4. Provide a portable medication profile such as a wallet medication card or *Passport to Good Health* so the patient may inform health providers about all medications used
- V. Problem: Miscellaneous medication related problems
  - A. Assessment
    - 1. Patient has medication allergies or hypersensitivity reactions
    - 2. Patient has difficulty opening medication containers
    - 3. Patient has difficulty swallowing medications
    - 4. Patient is concerned about the cost of medications
    - 5. Patient has negative perceptions about the use of medications
    - 6. Patient has other medication related problems or concerns



- B. Objective: Reduce miscellaneous medication related problems
- C. Potential strategies and tools to achieve objective
  1. Advise patient to inform all health professionals about medication allergy or hypersensitivity
  2. Advise patient to obtain appropriate medication allergy jewelry or other alert system
  3. Advise patient to request non-childresistant caps from pharmacist
  4. Instruct patient in methods to easily swallow medications
  5. Advise patient to request generic medications from pharmacist or less expensive therapeutic alternatives from physician
  6. Provide information to decrease negative perceptions about the use of medications
  7. Provide information on miscellaneous topics

<sup>a</sup>The Patient Education Assessment Form contains a total of 31 questions on 17 pages.

### **Appendix C: Patient satisfaction questionnaire items<sup>a</sup>**

#### **Interpersonal quality**

1. The pharmacist was very friendly when asking me questions about my use of medications
2. The pharmacist seemed interested in my responses to the questions about my medical history and use of medications
3. The pharmacist was very rude when asking me all those questions about my use of medications<sup>b</sup>
4. The pharmacist spoke to me as if I were a child<sup>b</sup>
5. The pharmacist was very considerate when discussing ways to improve my use of medications
6. The pharmacist seemed interested in trying to help me improve my knowledge about the use of medications
7. The pharmacist was very rude to me when discussing ways to improve my use of medications<sup>b</sup>

#### **Technical quality**

1. The pharmacist explained to me why so many questions about my use of medications were needed.
2. The pharmacist asked too many questions that really did not relate to my use of medications and health<sup>b</sup>
3. The pharmacist gave clear explanations when discussing ways to improve my use of medications
4. I feel that the pharmacist provided me with very useful information about my medications
5. After I talked to the pharmacist, I felt more confused about the proper use of medications<sup>b</sup>

#### **Accessibility/convenience**

1. The interview that I had with the pharmacist was very time consuming<sup>b</sup>
2. If I had to do the interview again, I would do it

#### **Efficacy/outcomes**

1. The interview process made me think about the way I use medications

2. The meeting with the pharmacist helped to make me more aware about the use of medications
3. The meeting with the pharmacist helped me to remember to take my medications as prescribed by my doctor
4. The meeting with the pharmacist made me try to find out more about my medications from my physician
5. The meeting with the pharmacist made me try to find out more about my medications from my own pharmacist
6. The meeting with the pharmacist made me try to find out more about my medications from the *About Your Medicine* book

---

<sup>a</sup>Responses to questions were via a 5 point Likert-type scale with 1 being strongly disagree and 5 strongly agree.

<sup>b</sup>Response scale of negatively worded items reversed for index construction.