

The Clinical Pharmacist in a Family Practice Residency Program

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A project of interdisciplinary family medicine education was conducted in which a clinical pharmacist served as a drug therapy consultant-educator in a family practice residency program. The clinical pharmacist provided drug information, advised about drug therapy, taught in formal conferences, prepared and disseminated a drug information bulletin, made rounds with the physicians, provided drug blood level consultation, and conducted a drug utilization review project. The family physicians' attitudes about clinical pharmacy were assessed by interviews before and after the project and by a questionnaire administered after the project. The physicians and the pharmacist in this model were observed to have a greater understanding of the interdisciplinary team practice concept; and an active role for the clinical pharmacist as a teacher and consultant was reinforced.

Interdisciplinary provision of primary health care was first reported in 1949.¹ Since that time, various projects in interdisciplinary patient care and medical education have been recorded.¹ Programs in which nurses,² nutritionists,³ and pharmacists^{4,5} served as teachers of physicians and medical students have been published. The results of these projects were reported as subjective descriptions of benefits to patient care and physician learning. Systematic objective evaluations of the attitudinal effects of clinical pharmacists practicing with and serving as teachers of physicians in ambulatory care settings have not been performed.

The purposes of this project were twofold: (1) to establish a clinical pharmacist as a teacher and practitioner in a family practice residency program; and (2) to measure the effect of that activity upon the physicians' attitudes about practicing with a clinical pharmacist.

Methods

The project of clinical pharmacy consultative and educational services was established at the Family Medical Center (FMC) of the University of Kentucky from September 1, 1977 to March 1, 1978. Six faculty and 21 resident physicians comprised the practice group at the FMC. The residency training program is fully accredited by the American Medical Association. The practice areas used by the family physicians were the Family Medical Center, University Hospital, and Central Baptist Hospital, a private hospital near the university.

A pharmacist (N.H.) established a clinical practice with the family physicians during the third year of her pharmacy residency program. The three-year pharmacy residency program at the University of Kentucky is a postgraduate training program designed to provide experience in clinical pharmacy practice, instruction, and research. As a pharmacy resident, the author had gained experiences in University Hospital and in a rural ambulatory care clinic. During her third year she selected practicing clinical pharmacy in ambulatory care facilities as her area of concentration. To enhance the family practice residency program and to

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Table 1. Activities Identified by Family Practice Physicians on the Questionnaire as Being Performed by Clinical Pharmacists

Activity	% Responding (N=24)*
Provides drug information to physicians	100
Serves as a drug information resource	100
Monitors and reviews the prescription of drugs by physicians	96
Works directly with physicians and other health care personnel	96
Provides toxicology information about drug poisonings	96
Teaches groups of patients, physicians, nurses, and other health care professionals about drug therapy	92
Consults with physicians about individual patients and their drug therapy	92
Counsels patients about drugs and their effects	92
Rounds with physicians in the hospital	88
Maintains patient drug profiles	83
Monitors drug blood levels	75
Performs drug research	75
Monitors individual patients and their drugs	75
Teaches pharmacy students about drug therapy	75
Prepares drugs and fills prescriptions	42
Dispenses drugs directly to patients	25
Sells drugs	13
Treats simple illnesses by recommending the use of nonprescription (OTC) drugs	13
Provides primary patient care to patients with acute or chronic illnesses	8
Is a businessman	8

*Respondent could select more than one choice

broaden the pharmacy resident's experiences, this interdisciplinary clinical education program was established. The practitioners had not practiced with a pharmacist in the clinic before.

The pharmacy resident practiced as a drug therapy consultant-educator for the physicians. She was available to provide drug information and advise about drug therapy, to teach in formal conferences, to prepare and disseminate a drug information bulletin, to make rounds with the physicians in the hospital, to provide a drug blood level consultation service, to interview and counsel patients, and to conduct a drug utilization review (DUR) project. The pharmacist did not dispense drugs or perform primary patient care.

It was hypothesized that changes in the attitudes of physicians about clinical pharmacists and about practicing with a clinical pharmacist would occur and, to enable documentation of this, assessments of their attitudes were made before and after the project by means of an interview. An anthropology graduate student interviewed each physician, using a structured questionnaire with open-ended questions, immediately prior to and within three weeks of the end of the project. Each interview was audiotaped and transcribed into typed copy.

The physician attitudes assessed were in the subject areas of: (1) pharmacists and clinical pharmacy practice, (2) drug information and con-

Table 2. Physicians' Perceptions of the Effect of Clinical Pharmacy Services upon Their Practice as Elicited by the Questionnaire

Service (No. Respondents)*	Effect (% Respondents)		
	Beneficial	Detrimental	None
Giving Drug Information (24)	96	0	4
Being Available for Answering Questions about Drugs (24)	100	0	0
Providing Drug Information Resources (24)	96	0	4
Conducting Conferences (24)	96	0	4
Performing Drug Utilization Review (24)	83	0	17
Making Hospital Rounds (19)	79	0	21
Counseling Patients about Drugs (16)	81	0	19
Monitoring Drug Blood Levels (13)	54	0	46

*Number physicians citing the service to be rendered to their practice

sultation service, (3) physician education, (4) drug utilization review, and (5) hospital rounds. Physicians were asked to describe their understanding of each subject, and their perception of the effect of the clinical pharmacist's activities on each subject area of their practice.

The interviews provided information about the changes in the physicians' feelings and perceptions; however, they did not allow for extensive quantification of their attitudes. For this reason a written questionnaire, using the interview results as guidelines, was prepared. This questionnaire was administered to the physicians two months after completion of the project so that the attitudes elicited would be those that endured after the clinical pharmacist's pilot project had ended.

The data elicited from the interviews and the questionnaire were analyzed separately. To identify changes in attitudes, the interviews of the physicians questioned both before and after the program were reviewed for key words or phrases pertaining to the subject areas listed above.

Results

The pharmacist answered numerous drug related questions and entered into many discussions about patient care situations and the choosing of appropriate pharmacotherapeutic agents. She made rounds in the hospital daily Monday through Friday. She presented a total of 21 drug therapy conferences to the physicians and nurses and three drug information bulletins were prepared and distributed. Her involvement with patient counseling and pharmacokinetic drug dosing was minimal due to a small number of requests for these services. A

drug utilization review project studying the treatment of pharyngitis at the FMC was conducted. Upon review of the diary maintained by the pharmacist it was apparent that her major efforts were to provide drug information, to advise about the therapy of patients, and to teach the physicians drug therapy.

Twenty-three physicians were interviewed prior to the project and 25 were interviewed after completion of the program. Of these, 20 physicians were found to have been interviewed both before and after the intervention and comprised the pairs for analysis of attitude changes. Questionnaires were completed by 24 of the 27 physicians, an 89 percent response rate.

The results of the analysis of the interviews and the questionnaires were reviewed separately and grouped in the five subject areas previously listed.

Pharmacists and Clinical Pharmacy Practice

The physicians considered a pharmacist in the general sense to be one with training in drugs who dispenses medication. Their concept of a pharmacist was based upon their perception of a community pharmacist. Prior to the project, most of the practitioners could give a minimal description, although limited, of the activities of a clinical pharmacist. Many practitioners saw the clinical pharmacist as one who performs patient counseling and monitors patient drug therapy. Following the project, the practitioners were able to describe a full range of activities of a clinical pharmacist, consistent with the activities of the project pharmacist.

Table 3. Physicians' Frequency of Using Sources Available for Drug Information as Elicited on the Questionnaire

Source (No. Physicians Responding)	% Respondents Using Source		
	1st	2nd	3rd
Physicians' Desk Reference (23)	91	0	9
Pharmacist in Clinic (22)	0	55	23
Medical Colleagues (16)	6	13	38
Journals (15)	0	26	26
Goodman and Gilman (11)	0	0	27

When analyzing the 20 interview pairs, a number of significant changes in attitude were observed following the program when compared with those prior to the program.

1. More physicians described a clinical pharmacist to be one who works directly with other health care personnel (8 before, 17 after).

2. More physicians cited a clinical pharmacist as a source of drug information (14 before, 20 after).

3. More physicians stated that a clinical pharmacist was one who teaches physicians about drug therapy (1 before, 7 after).

4. More physicians stated that they would ask a clinical pharmacist to recommend the appropriate drug therapy for a given condition or patient (3 before, 8 after).

5. More physicians stated that a clinical pharmacist was one who monitors the prescribing habits of physicians through a drug utilization review process (1 before, 9 after).

6. More physicians cited drug information - consultation services of a clinical pharmacist as being beneficial to their practice (3 before, 16 after).

7. Fewer physicians expressed territorial concerns regarding clinical pharmacists' activities (9 before, 1 after).

8. Fewer physicians described a pharmacist, in the general sense, as being one who fills and dispenses prescriptions (19 before, 12 after).

Table 1 displays the responses to the questionnaire in which 75 percent or more of the physicians selected those activities associated with the advisor, educator, drug therapy monitor role. When given a choice of clinical pharmacist role models, 77 percent chose "one who provides drug information, teaches physicians and nurses in conferences about drugs, and conducts drug utilization review projects." The practitioners were asked to

indicate whether the services of the clinical pharmacist were beneficial to, detrimental to, or had no effect upon their practice. Fifty-four percent or more of the physicians felt that the services that they perceived being rendered to their practice were beneficial (Table 2). No one perceived any service as being detrimental to his/her practice.

Drug Information and Consultation Service

In the interview, the *Physicians' Desk Reference (PDR)* and the pharmacist were cited as the most frequently consulted sources of drug information. The physicians claimed to have consulted the *PDR* for pragmatic prescription writing information and the clinical pharmacist for therapeutic indications and contraindications, in-depth drug literature searches, and reviews and conferences.

The physicians ranked by questionnaire their five most frequently used sources of drug information. The *PDR* was cited as the most frequently used resource and the clinical pharmacist was the second most frequently used resource (Table 3).

The physicians claimed that the primary benefits to their practices of the drug information and consultation services were: (1) improved physician knowledge (cited by 88 percent of the respondents to the questionnaire), (2) saved physician time in researching information (cited by 88 percent), (3) improved patient care (67 percent), (4) created a more judicious and conscientious attitude towards drugs (50 percent), and (5) improved patient knowledge (42 percent).

Physician Education

During the six-month period, 21 conferences regarding drug therapy were given to the physicians and nurses of the Family Medical Center. A few examples of the physician conferences given were: the treatment of asthma; considerations in gentamicin dosing; appropriate use of cimetidine;

and current therapy of tuberculosis. Ninety-six percent, or 24 of 25 physicians participating in the follow-up interview, attended one or more of these formal conferences. The quality of the material and the teaching ability of the clinical pharmacist were rated as excellent or good by 96 percent of the physicians during the interview. On the questionnaire, 92 percent (22 of 24) of the physicians noted having a positive attitude about the pharmacist as a teacher because she added a new perspective to drug use. The remaining two were neutral, feeling that a physician or a pharmacist would be of equal benefit as teachers. Seventy-one percent of the respondents to the questionnaire claimed that the conferences were very valuable to their practice by helping with drug therapy decisions; 29 percent said that they were of moderate value, being of some help but not essential.

Drug Utilization Review

The DUR project was designed to study the prescribing patterns of the physicians in the treatment of streptococcal pharyngitis. Actual prescribing habits, as documented by chart review, were compared to the group's criteria for appropriate therapy, elicited by the use of a questionnaire. The results were disseminated to the physicians in a written report and by a formal conference.

None of the practitioners could describe the concept of the drug utilization review process in the initial interview. Following the project, 70 percent of the physicians described: a process of establishing criteria for drug use, reviewing current drug use practices, reporting and discussing findings, and taking corrective measures, if needed. Eighty-five percent of the physicians readily stated that additional drug use review projects should be conducted at the FMC, and 56 percent of the physicians felt that the pharmacist should take the leadership role in these projects.

When analyzing attitude changes about drug utilization review, two significant changes in attitudes were observed following the program when compared with those prior to the program.

1. More physicians were able to correctly describe drug utilization review (0 before, 15 after), and

2. More physicians described positive attitudes about drug utilization review (12 before, 17 after).

Fifty-six percent of the physicians claimed by

questionnaire that the DUR project had a positive effect on their practice.

Hospital Rounds

The clinical pharmacist made rounds with each of the faculty and second and third year residents at the community hospital. The first year residents were assigned to rotations in University Hospital and did not make rounds with the clinical pharmacist. In the interview 71 percent of the physicians who made rounds at the community hospital expressed positive attitudes about having a pharmacist on rounds before the project and 88 percent expressed positive attitudes following the project. On the questionnaire the physicians selected the following benefits of having the pharmacist on rounds: (1) saved physicians' time (82 percent of the respondents), (2) improved physicians' knowledge (71 percent), (3) improved physicians' prescribing (35 percent), and (4) no effects (12 percent).

Self-Perceived Attitudinal Changes

The physicians were asked to indicate by questionnaire their perceived attitudinal changes regarding clinical pharmacists and drug therapy. Regarding clinical pharmacists, 85 percent of the physicians said that there were no changes in their attitudes. Twenty-five percent said that they were more open and receptive to pharmacists; one physician reported less concern about pharmacists' being a threat to physicians.

Concerning their attitudes about drug therapy, 42 percent of the physicians felt that they were more conscientious about all considerations of drug therapy, 25 percent were more conscientious about adverse drug reactions and interactions, and 58 percent said that there were no changes in their attitudes about drug therapy.

Discussion

Benefits of interdisciplinary training have been described as increasing the knowledge of the individual team members, improving knowledge and awareness of the team concept, and encouraging a greater sensitivity to the social and medical needs of patients.¹⁻⁶ Improved patient care would logically result from these effects, although this has not been reported in well-designed trials.¹

In the six-month period of this project physician knowledge of and attitudes about pharmacists

practicing in the family medicine team were improved, and an attitude of concern for appropriate drug use with patients was fostered, as reported by the physicians. The physicians' understanding of the activities of a clinical pharmacist was affected by the practice of the project pharmacist. The activities selected by the physicians as performed by clinical pharmacists and the clinical pharmacist role model chosen by the majority of the physicians were identical to the pharmacist's practice in this report. The physicians viewed the clinical pharmacist as an educator, a consultant about drug therapy, and an overseer of drug use.

Following the project, when compared with before the project, more physicians described a clinical pharmacist as being one who teaches physicians, serves as a source of drug information, works directly with other health care professionals, recommends appropriate drug therapy, and monitors the prescribing habits of physicians. This improved awareness of pharmacists practicing in a way different from the traditional pharmacist was demonstrated in the finding that fewer physicians in the follow-up interviews described a pharmacist, in the general sense, as being one who fills prescriptions. When the physicians became aware of the clinical pharmacist's activities and the benefits for their practice, their concerns about the pharmacist usurping their authority with patients or encroaching upon the practice of medicine were reduced. The effects that a clinical pharmacist practicing as a primary care clinician or dispensing drugs would have had on the physicians' attitudes were not assessed in this project.

The pharmacist was able to improve the physicians' knowledge of and attitudes about drug utilization review. The findings that more physicians were able to describe the utilization review process and that more physicians described positive attitudes about DUR resulted from the pharmacist conducting the drug utilization review study of the treatment of pharyngitis. All the physicians were involved in the DUR program by contributing to the establishment of the prescribing criteria and by reviewing and discussing the findings. The physicians were very receptive to the peer review process and cited improved drug prescribing and improved chart documentation habits as resulting from the project.

The physicians perceived the clinical pharmacist's activities as a consultant-educator to have

improved their knowledge and to have created a more judicious and conscientious attitude about drugs. They also felt that her activities improved their prescribing habits and saved them time researching the drug literature. The physicians claimed that the overall effect of her activities was to improve patient care. Their perceptions of the effects of the clinical pharmacist on their practice were observed by the authors to have been honestly stated. Although the pharmacist's personality may have affected the physicians' assessments, the authors could neither confirm nor deny that this occurred.

The pharmacist became much more aware of family practice as a discipline by working directly with the residents and faculty of the FMC. She developed an appreciation of the information needs of the family physicians in drugs and therapeutics. She gained valuable experience in the techniques of teaching physicians. She became an integral member of the health care team as she participated in making decisions regarding evaluation and pharmacotherapeutic management of patients. Her role varied between being a teacher and a student as she learned from her medical colleagues while improving their knowledge about drugs. Practicing with the team, she was able to develop and refine her philosophies about clinical pharmacy practice in ambulatory care.

The interdisciplinary clinical training program described in this report was observed to have resulted in significant positive changes in the attitudes of the physicians about practicing with clinical pharmacists. Additionally, the pharmacist's perceptions of family physicians' training and practice were broadened. Mutual benefits resulted from this project of interdisciplinary family medicine education and similar models should be developed, documented, and reported in other family practice teaching programs.

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