The Clinical Pharmacist and the Family Physician

Robert K. Maudlin, Pharm D
Spokane, Washington

Pharmaceutical services have traditionally revolved mainly around the distributive function of providing the drugs that physicians have ordered for patients. Of all health professionals, pharmacists have been the most isolated in their practice and have seldom been involved in direct patient care. As a result, their knowledge has been under-utilized. Recently, however, in some areas of the country the role of the pharmacist has expanded to that of a drug information consultant. This expanded role passes the unique knowledge of the pharmacist, either directly or indirectly, to the patient through such activities as: discussing with physicians drug selection, dosage, adverse reactions, interaction, and interference with clinical laboratory tests; monitoring patient drug therapy to insure efficacy and to minimize adverse reactions; determining individual patterns of drug utilization through patient interviews; making certain that patients are instructed in the proper use of their medications; giving lectures to health-care personnel concerning rational drug therapy; and increasing public awareness in the areas of poison prevention, venereal disease, and drug use, misuse, and abuse. The combination of these practices which are intended to assure the maximum effectiveness and safety of drug therapy in the context of the patient's total environment has been termed *clinical pharmacy*.

In order to prepare pharmacists for these roles there have been significant changes in the educational goals and patterns within colleges of pharmacy. Extended biological training and pharmacology, plus the addition of biopharmaceutics, biostatistics, pharmacokinetics, biological chemistry, pathology, anatomy, physiology, microbiology, parasitology, and that "essential" clinical experience have all been added to the pharmacist's formal education.

In today's pharmacotherapeutics we note an increased utilization of drugs, an increased awareness of iatrogenic disease and adverse drug reactions,[1,2] a decreased emphasis on pharmacology in medical schools with a corresponding increase in pharmacy schools,[3,4] and a dependence of physicians upon company promotional sources for drug information. Unfortunately, when a physician selects the appropriate medication, the patient is not likely to take it correctly.[5]

At Family Medicine Spokane, it was felt that a pharmacist would be able to enhance patient care and resident education by promoting the more rational utilization of drugs. A full-time pharmacist has participated as a faculty member in the residency program for the last two years. Each morning the pharmacist makes hospital rounds with other faculty and residents. It is the responsibility of the pharmacist to provide drug information, assist in the selection of medications when appropriate, evaluate patient response to medications, and prevent the occurrence of significant drug interactions. The pharmacist also takes medication histories on patients, and data derived from these are utilized in future therapeutic decisions. Patients also receive medication consultation at the time of discharge so they will have a better understanding of what drugs they are taking, why they are taking them, and what beneficial or adverse effects may be anticipated.

The pharmacist has essentially the same responsibilities at the Family Practice Center and is currently receiving 10 to 15 inquiries from the residents and faculty for drug information or opinions on therapeutics each day. We have recently documented that patients leave our office not with the national average of one prescription per visit but instead with an average of one-half prescription per visit. We do not feel that we have compromised the care of our patients by reducing the utilization of medications, and we feel the pharmacist is at least in part

From the Spokane Family Practice Residency Program (affiliated with the University of Washington, Department of Family Medicine), Spokane, Washington. Requests for reprints should be addressed to Dr. Robert K. Maudlin, Educational Coordinator, Family Medicine Spokane, South 511 Pine Street, Spokane, Wash 99202.

responsible for this attitude toward the use of drugs. The pharmacist also makes therapeutic rounds on all patients in our skilled nursing facilities twice each month to evaluate patient response to their medications. This information is related to the residents who make therapeutic decisions. We have taken our patients off of 30 to 50 percent of their medications as a result, and again do not feel we have compromised their care.

Each month the pharmacist gives a formal presentation on some aspect of pharmacology to our residents and faculty. Along this same line, weekly presentations by detail men to the residents are reviewed and commented upon by the pharmacist. We have found this to be an excellent approach to removing the bias from such company presentations. The pharmacist also prepares a quarterly drug information bulletin. The purpose of this bulletin is to provide review and editorial comment on recent pharmacology literature and to supplement the residents' knowledge of pharmacology with current, unbiased information.

Frequent chart review in the Family Practice Center stresses therapeutics and drug utilization review and this has been reflected in subsequent resident treatment regimens. The pharmacist's patient contact involves obtaining medication histories and counseling patients on their medications. The intent is to enhance patient compliance, minimize adverse reactions, and assure optimal therapeutic response. It has been shown that such pharmacist activities can result in patients understanding their drug therapy better, that 92 percent comply with the prescribed regimen as opposed to only 56 percent of controls, that undesirable and unintended reactions were detected more often, and that better patient response was obtained.[6]

In addition to the benefit derived from these direct responsibilities of the pharmacist at Family Medicine Spokane, we feel that our residents can be taught to expect and utilize a certain amount of knowledge from their pharmacist colleagues, an attitude that will carry over into their future practice. Such a program is deemed essential to facilitate a closer working relationship between these two professions in the interests of better patient care.

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Research in Family Practice Residencies Why and How

William J. Kane, MD
Durham, North Carolina

The advance of laboratory-based techniques of investigation, perhaps reinforced by the interpretation of Flexner's word "excellence" as "precision," shifted the development of medical knowledge away from the bedside. The skills of the researcher came to be viewed as different and apart from the skills of the clinician. The term "research" became identified with a full-time scientist, in a hallowed laboratory crowded with test tubes and personnel, answering an esoteric question; the image of a busy practitioner carrying on clinically-oriented investigation through data collection and careful observation was excluded from the picture.

Presented in their medical education with these two distinct role models of researcher and clinician, family physicians identified with the clinical role model. They looked upon research as a thing apart, something done by other people in other places, whose results were reported in journals and occasionally applied, but whose activities were foreign to most clinicians and remote from the majority of patient needs. Research seemed more a pathway to promotion in academia than a road to sounder decision-making in the office. Family physicians felt free to say they were not research-minded without considering this a confession of professional limitation. In fact, some physicians admit they chose family practice deliberately to escape research demands.

The widespread existence of such thinking is disturbing now that family practice, at last recognized as an academic and clinical discipline in its own

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Requests for reprints should be addressed to Dr. William J. Kane, Director, Duke-Watts Family Medicine Program, 1012 Broad Street, Durham, NC 27705.

right, faces research needs and opportunities which will determine its future both in academia and in practice. It is time to acknowledge that the image of a family physician integrating scientific investigation with delivery of comprehensive patient care is the image of a practitioner at his or her best.

Unfortunately, current surveys of family practice programs indicate that there is little clinical research being undertaken. If we were to poll the more than 1,000 graduates of family practice residency programs during the past five years, we would most likely find that few of their practices are the site of any significant ambulatory care research. Victims of the dichotomy between research and clinical medicine, they completed their training without exposure to family physician role models who successfully pursued major research in the context of everyday practice. It would be tragic to continue to produce graduates who are neither inclined nor prepared to conduct systematic research in their practice settings. They can ill afford not to answer the critical questions related to chronic disease management, preventive medicine, health surveillance, and patient compliance, which have so plagued the practitioners of the past.

Part of our task as today's family practice educators, then, is to translate into educational efforts the insight that research and quality patient care are intimately related. We should begin by identifying questions which must be answered by research to improve the effectiveness and efficiency of patient care. Realistic and appropriate medical care is difficult to find in our overspecialized environment. Technology has far outgrown its appropriateness to patient care, as evidenced by the extreme case of Karen Quinlan. Medical science needs answers to questions about the natural course of disease, about the functional effectiveness of medical intervention, and about the interplay of psychosocial factors in medical care. Until now, family physicians have felt obligated to follow standards of care established at research centers even though their "clinical experience" told them that these standards were often impractical and at times even counterproductive. Unfortunately, they lacked the research skills to prove their points of view. Yet the family physician is the one practitioner who sees the patient and his or her illness in full perspective, and it is the family physician who should be able to generate hypotheses about what forms of care are realistic and appropriate. It is now imperative to design residency programs that equip graduates to assume their rightful role as the specialists who establish ambulatory care standards through ambulatory-based research.

Subjects for Research

The range of questions that we might begin to address with research in our residency programs includes some basic research questions (those which examine the relationship between medical interventions and health-care outcomes) and some applied research questions (those which examine the degree to which a given practice conforms to accepted criteria.)

In the realm of basic research, we must carefully investigate the relationships between specific diagnostic or therapeutic procedures and patient outcomes. Such investigations are essential in establishing the cost-effectiveness of physician interventions, with cost being a major concern of government, the patient and the physician. Physician decisions concerning when to hospitalize, when to prescribe, or when to obtain x-rays, laboratory data, or consultation are the primary determinants of health-care cost. Unfortunately, these decisions are too often based on intuition, opinion, and guesswork rather than sound data. The answers to these and similar fundamental practice questions are not to be found in the literature. Through carefully designed research, family physicians can provide the data on which to base rational management decisions in the office.

In the realm of applied research, we must spearhead the implementation of systems to monitor the quality of ambulatory care. Although, due to the present vacuum in basic research, quality cannot be defined to everyone's satisfaction, we can at least begin to establish tentative standards and to examine office care. Frequently occurring illness, such as urinary tract infection, hypertension, pharyngitis, and diabetes, should be audited regularly. Simple questions can be answered according to currently accepted minimal criteria. "How many of our patients with hypertension have been lost to follow-up? Among those being followed regularly, how many are under adequate control, have a reasonable data base, and have received any education concerning their disease? How many children have been properly immunized and have such data recorded in their charts? Do all women in our practice receive Pap smears and breast examinations at regular intervals?" Here again, opinions are not adequate. And when the data are examined, physicians usually do not perform to their own expectations.

If groups of physicians agree to collect similar data, comparisons can be made in the area of resource utilization. Descriptive studies of the number of x-rays, laboratory tests, referrals, and admissions per 1,000 patient visits may identify major differences from practice to practice. Such studies may provide more insight into the physician decision-making process and suggest areas in need of basic investigation. Since worthwhile research requires that clinicians explicitly define their terms, set criteria for diagnosis, and carefully record their findings, experience with research may also improve the quality of ambulatory care.

Methods of Research

Simple, inexpensive, and effective methods are currently available to pursue both basic and applied research questions in family practice. These methods include data acquisition procedures (such as the Problem-Oriented Medical Record and various encounter forms), data classification schemes (such as ICHPPC, the internationally accepted classification of disease in primary care), and data retrieval devices (such as age/sex registries, geographical filing systems, and disease indices). These methods allow any family practice to readily collect appropriate data for sound clinical studies. The data can be recorded in manual or computerized systems with minimal expenditure of time or money. The optimally effective family physician must be trained not only as a sensitive, competent clinician but also as a sensitive, competent critic of medical practice, especially his or her own. For the present, this requires at least a willingness and ability to utilize the Problem-Oriented Medical Record and other methods of ambulatory data

collection in order to define a practice in terms of the patients' age, sex, diagnosis, and socioeconomic status. These basic competencies equip a family physician to deal with issues such as quality control audits, administrative and operational planning, preventive medicine, outreach, and planning continuing education, even if he or she decides not to conduct more basic research studies in the post-residency setting.

Research in Residency Programs

If we accept the premises that research is an integral part of patient care, that research training is an essential component of family practice residency education, and that ambulatory care research methods are readily available, then how do we go about motivating faculty and residents to become involved in research?

It will be impossible to motivate residents toward research if we do not first concentrate on the faculty. Faculty attitudes critically affect residents' interest in research. Any learner is able to quickly discern the informal reward system operating in an educational program. As teachers, we are all quite capable of explicitly or implicitly communicating to residents what our priorities are. The willingness of a family practice residency program to provide personnel, space, finances, and defined curricular time indicates to all residents the priority placed on research activities, whether these activities involve basic research questions or simple evaluation of office-based care.

In order to create a research-oriented environment, I suggest that the following steps be undertaken by a program and its faculty:

1. Seek an affiliation with a University Department of Community Medicine or School of Public Health for specialized research support that will be necessary in the setting of graduate education.
2. Use such an affiliation to develop a program of faculty development in epidemiology and biostatistics for family physicians on the faculty. It is essential to form a link between the academic epidemiologist and the practitioner. A family physician with additional education in epidemiology and health services evaluation will be invaluable to a residency program.
3. When possible, expand the family practice faculty to include individuals from other disciplines who have research experience in their own fields and an appreciation for the research questions being raised in the ambulatory care setting.
4. Search for and allocate the financial resources necessary to facilitate research in the Family Practice Center setting. The need for data collection and record maintenance at a level adequate to provide ample opportunity for young physicians to engage in a variety of useful research projects is more costly in a residency program with its educational overhead than in practice. However, this must be a high priority expenditure if we are to achieve our goal of producing fully rounded family doctors.

Having developed faculty research skills and adequate financial resources, a residency program's efforts to enhance the motivation of residents should include the following:

1. Define specific educational objectives aimed at clarifying for every resident the relationship between research and patient care. Residents are inquisitive, intelligent, and certainly oriented to delivering the best possible patient care. Given explicit objectives that identify the skills they need to monitor and investigate their patient care, residents can be expected to pursue those skills during the course of their residency training.
2. Implement a curriculum which allows time and resources for residents to design, conduct, and interpret a project within the Family Practice Center. Appropriate rewards must be available for the resident who excells in this area as well as on the hospital ward.
3. Encourage the continuous involvement of at least some of the faculty in research projects in the Family Practice Center. If the Family Practice Center is organized and operated to demonstrate that data collection and research do not disrupt a busy practice and are needed to deliver quality care, most residents will participate.
4. Encourage each resident to produce one publishable paper or one well-documented assessment of the Family Practice Center practice during his or her three years of training. Family practice programs might even extend their guidance beyond the residents' completion of training, providing graduates with advice, moral support, and in some cases even the start-up resources necessary to develop research capabilities in their own practice settings.

Ultimately, the most important reason for giving research a high priority within a family practice residency program is to insure that graduates will bring to their own practices the necessary attitudes and skills to conduct productive patient care research. To produce graduates without this orientation toward research is to condemn family practice to failure as a true, intellectually vigorous specialty. These capabilities will be part of the differentiation between general practice and family practice, part of the excellence in ambulatory care which our society needs and which we are all committed to provide.

This section of the journal is designed to present clinical problems which focus on patient management, problem-solving, and other elements integral to family medicine. It features reinforcement of major teaching points through further discussion and supplemental references which appear on the following pages.

Self-Assessment in Family Practice

These materials have been prepared by members of the Self-Assessment Panel of *The Journal of Family Practice*. Membership: R. Neil Chisholm, MD, Chairman (University of Colorado, Denver), B. Lewis Barnett, MD (Medical University of South Carolina, Charleston), Paul C. Brucker, MD (Thomas Jefferson University Hospital, Philadelphia, Pennsylvania), Laurel G. Case, MD (University of Oregon Medical School, Portland), Ian R. Hill, MD (Plains Health Centre, Regina, Saskatchewan), Kenneth F. Kessell, MD (MacNeal Memorial Hospital, Berwyn, Illinois), John A. Lincoln, MD (University of Washington, Seattle), Richard C. Reynolds, MD (University of Florida, Gainesville), Gabriel Smilkstein, MD (University of California, Davis), William L. Stewart, MD (Southern Illinois University, Springfield).

With the increase in venereal diseases in the United States, it seems appropriate to consider some of the questions raised in the family physician's office by these conditions.

Question A

A 22-year-old woman, unmarried, with a variety of sexual partners in the past and with one steady partner lately presents to your office in early pregnancy seeking prenatal care. Her last menstrual period was about eight weeks ago. The remainder of the history is not unusual.

Physical examination reveals a six-week pregnancy and a woman who otherwise seems normal. Routine laboratory work is within normal limits except for a VDRL positive titer of 1:128.

You would: (Choose the best answer.)

A. examine the cerebral spinal fluid
B. order a treponemal test such as the FTA-ABS
C. treat with procaine penicillin G 1.2 mg units daily for ten days
D. treat with benzathine penicillin G 2.4 million units IM
E. treat with tetracycline hydrochloride 500 mg, 4 times a day for 15 days
F. treat with erythromycin, 750 mg, 4 times a day for 15 days

FTA-ABS is positive. You would now treat with: (Choose the best answer.)

A. procaine penicillin G 1.2 million units daily for ten days
B. benzathine penicillin G 2.4 million units IM
C. tetracycline, 500 mg, orally q.i.d. for 15 days
D. erythromycin, 750 mg, orally q.i.d. for 15 days

Subsequently in the pregnancy which of the following would you do? (Choose all correct answers.)

A. monthly quantitative nontreponemal (VDRL or RPR) test with retreatment if a four-fold rise occurs
B. examination of the sexual partner
C. treatment of the sexual partner, even if examination and serologic testing is normal
D. careful examination and serologic testing of the infant shortly following birth
E. CSF examination of the infant before treatment

Question B

Another 22-year-old woman, a friend of the first one, also becomes pregnant and seeks your care. History, physical examination, and laboratory testing, including VDRL, are within normal limits in the first trimester of pregnancy.

The VDRL should be repeated in the third trimester.

A. true
B. false

Question C

A young man seeks your help because of a penile discharge of three days, duration accompanied by dysuria and frequency. Gram stain of the discharge reveals intracellular diplococci, gram negative, and culture shows N. gonorrhea. VDRL is negative.

Which treatment regime would you use? (Choose the best answer.)

A. probenecid plus penicillin G 4.8 million units IM
B. probenecid plus ampicillin 3.5 gm orally
C. spectinomycin hydrochloride 2 gm IM once
D. tetracycline 1,500 mg orally, then 500 mg q.i.d. for 4 days

Follow-up for the above patient should include which of the following? (Choose all correct answers.)

A. return if the discharge does not get better
B. revisit in one to two weeks to see if the discharge is gone and if the urine is clear
C. revisit in seven to ten days and reculture
D. examination of recent sexual contacts and treatment of those who are positive
E. examination of recent sexual contacts and treatment whether positive or not

Reviews of Audiovisual Materials

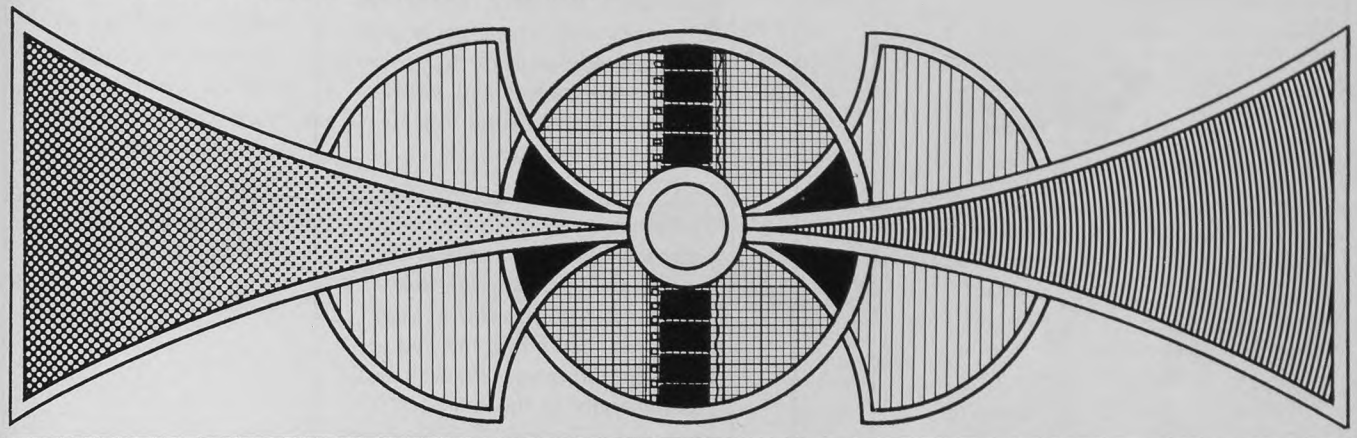
The following audiovisual materials have been reviewed by the Audiovisual Review Committee, an *ad hoc* group of the Education Committee of the *Society of Teachers of Family Medicine.* Membership: John P. Geyman, MD, Chairman (University of California, Davis), Richard M. Baker, MD (University of California, San Diego), Thomas C. Brown, PhD (University of California, Davis), Thornton Bryan, MD (University of Tennessee, Memphis), Laurel G. Case, MD (University of Oregon Medical School, Portland), Wendell B. Garren, MD (Geisinger Medical Center, Danville, Pennsylvania), James L. Grobe, MD (Phoenix, Arizona), Warren A. Heffron, MD (University of New Mexico, Albuquerque), Brian K. Hennen, MD (Dalhousie University, Halifax, Nova Scotia), Thomas L. Leaman, MD (Pennsylvania State University, Hershey), I. R. McWhinney, MD (University of Western Ontario, London), Donald C. Ransom, PhD (Sonoma Community Hospital, Santa Rosa, California), Philip L. Roseberry, MD (York Hospital, York, Pennsylvania), Rafael C. Sanchez, MD (Louisiana State University, New Orleans), Robert Smith, MD, (University of Cincinnati, Cincinnati, Ohio), William L. Stewart, MD (Southern Illinois University, Springfield), John Verby, MD (University of Minnesota, Minneapolis), Raymond O. West, MD (Loma Linda University, Loma Linda, California), Hiram L. Wiest, MD (Pennsylvania State University, Hershey). Reviews of each type of media were carried out by subgroups of the committee.

AUDIENCE

1 Family physician
2 Family practice resident
3 Family nurse practitioner/Medex
4 Medical student

MEDIA

A 35 mm slides
B 16 mm film
C Video tape
D Models



SOURCE	PROGRAM	MEDIA	AUDIENCE	COMMENTS	OVERALL APPRAISAL
Lakes Area Regional Medical Program 2929 Main Street Buffalo, NY 14214 ($10.00)	**Modern Day Diagnosis and Treatment of Vulvovaginitis**	A	1 2 3 4	This program reviews the diagnosis and treatment of various kinds of vaginitis including Monilia, Trichomonas, Hemophilus, and others. Its clinical content is quite sound, although some controversy currently exists concerning some of the recommended treatments. The technical quality is only fair, but the program does provide a useful review of the topic which should be supplemented by other teaching approaches to the subject.	Some value
MECOM 2 Hammarskjold Plaza New York, NY 10017 ($60.00)	**Cutaneous Reactions to Drugs**	A	1 2 3 4	The objectives of this program are clearly stated. Various types of skin reactions are classified and causative agents identified. The subject is dealt with comprehensively. Numerous cutaneous reactions are presented and well illustrated by slides. They are further described in a supplementary text. This format is quite conducive to effective self-learning and the program provides an excellent review of the overall subject.	Highly recommended