Excellence in the management of clinical pharmacy services

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Abstract: Differences in the management of clinical versus nonclinical pharmaceutical services, unique aspects of managing clinical services, and management challenges for the 1990s are described.

In nonclinical practice, pharmacists are located in the central pharmacy and have limited contact with physicians and nurses; managers focus on drug procurement, distribution, and accountability. A clinical program takes pharmacists to the patient's bedside and into more interprofessional contact; the management of a clinical pharmacy service is measured by the benefits received by patients, physicians, and nurses and by the job satisfaction of the pharmacists. Management of a clinical program requires (1) recognition of the potential for drugs to cause harm and commitment to pharmacists' responsibility for ensuring appropriate clinical outcomes, (2) analysis of the hospital and how clinical services can best be provided there, (3) obtaining resources to establish or gain access to a drug information service, (4) developing resources and support for a pharmacokinetics service, (5) designing efficient distribution systems supported by automated applications and an adequate technician staff, (6) developing a pharmacist staff that will gain physicians' and nurses' support for clinical programs, (7) developing an organized approach to keeping staff members up to date on new drugs and technology and assisting them in sharing this knowledge with physicians and nurses, (8) demanding and ensuring the quality of the clinical performance of each pharmacist, (9) documenting and evaluating the cost-effectiveness of services provided, and (10) recruiting and retaining good pharmacists and technicians. Challenges for the 1990s will be coping with increasing workload and limited resources; maintaining pharmacists' clinical competence; planning for pharmaceutical services by patient-care type and setting, continually evaluating need for current and new services, and developing a multiyear plan; and coping with rapid change.

For the successful implementation and management of clinical services, the pharmacy manager must manage the "people aspects" of change; obtain the resources of pharmacists' time, space, reference materials, and support systems; and then design the operational systems that will achieve comprehensive drug-use control and appropriate patient outcomes from drug therapy.

Index terms: Administration; Clinical pharmacists; Clinical pharmacy; Drug information; Personnel, pharmacy; Pharmaceutical services; Pharmacy, institutional, hospital

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Presented on October 14, 1987, in connection with Dr. Smith's designation as the third John W. Webb Visiting Professor in Hospital Pharmacy by the College of Pharmacy and Allied Health Professions, Northeastern University, Boston, MA.

The previous two Webb Visiting Professors, Robert B. Williams and Paul G. Pierpaoli, established difficult acts to follow, Bob with his theme of leadership and Paul with his theme of management diplomacy.[1,2] My comments are based on my 22 years of experience in developing and managing clinical pharmacy programs at two hospitals, first at the University of California, San Francisco, and, for the past 20 years, at Memorial Medical Center, Long Beach, California. I have been most fortunate to have had professional opportunities few pharmacists have ever had, and I have tried to make the most of them for the benefit of patients and our profession. I will share some selected philosophies, experiences, beliefs, and future challenges related to the achieving of "excellence in the management of clinical pharmacy services." I will describe differences in the management of nonclinical versus clinical services, unique management aspects of a clinical service, and some management challenges for the 1990s.

Before describing a nonclinical pharmacy service, I will state some philosophies that I firmly believe in at this stage of my career, based on professional experiences.

1. There are patients in every hospital who need and deserve the knowledge and skills of a competent pharmacist providing clinical services.
2. The mission of a pharmacist as a health professional is to provide all drugs and to help ensure safe and appropriate clinical outcomes from their use.
3. Pharmacist clinical practice, drug information, and clinical pharmacokinetics services result in improved quality and cost-effective drug therapy.
4. There must be an effective partnership between pharmacy managers and clinical staff to achieve excellence in pharmacy services.
5. Managerial capability and capacity are essential for the future success of the pharmacy profession and clinical services to benefit patients in all care settings.
6. The 1990s will be a severe test of the pharmacy profession and its management capability if the challenges and patient-care needs associated with present and future drug therapy are met.
7. The future of pharmacy will be exciting, challenging, and rewarding for pharmacists who are willing to accept their mission as health professionals.
8. Excellence in management of a clinical pharmacy service is measured by the benefits received by patients, physicians, and nurses and by the job satisfaction of pharmacists providing clinical services.

Nonclinical Pharmaceutical Services

Pharmaceutical services in a hospital without clinical services are focused on the accurate compounding and dispensing of drugs; drug purchasing, accountability, and inventory control; and drug formulary presentation. These functions are performed and managed within the central hospital pharmacy. Extension of services external to the pharmacy department is limited to narcotic control and drug formulary distribution. Pharmacists' drug knowledge is focused on the physical and chemical aspects of drug use.

The primary functions of nursing in the hospital medication system have been to order drugs from the pharmacy, prepare doses for administration, administer medications, chart drugs administered, keep drug records, monitor patients' drug therapy response, and provide information to the physicians. The physician's primary functions have been to prescribe drugs and dosages, monitor patient response, and make appropriate changes in drug and dosage when necessary.

Pharmacists' interprofessional relationships are limited because of the physical location of practice: The physicians and nurses are in the patient-care areas and the pharmacists are in the central hospital pharmacy. Communications between a physician and pharmacist or a nurse and pharmacist are limited to drug-distribution situations. The opportunities for interprofessional cooperation in the care of patients, as well as for interprofessional conflict, are limited.

The demands on pharmacy managers in a nonclinical service are for drug purchasing and inventory control, policies and procedures for the distribution systems, control of drugs external to the pharmacy area, working with nursing to improve the operational and communication problems inherent in the system, drug-related policies and procedures for the pharmacy and therapeutics committee, the drug formulary, and proper accountability to hospital administration for financial, legal, and professional standards.

The results of this type of pharmaceutical services and limited interprofessional relationships were well documented in the literature in the 1960s and early 1970s, as manifested by the following list of drug-related problems:

1. High rate of medication errors.[3,4]
2. Excessive rate of adverse drug reactions.[5-7]
3. Drug–drug interactions.[8]
4. I.V. drug admixture incompatibilities.[9]
5. Drug-induced diseases.[10]
6. Inefficient use of health manpower.[11,12]
7. Drug–laboratory test interactions.[13]
8. Physician contribution to medication errors.[14]
9. Drug waste.[15]
10. High cost of the hospital medication system.[16]

From the point of view of the patient, who is expecting drug therapy that is safe, accurate, efficient, effective, and of least cost, the hospital medication system without clinical pharmacy services does not achieve patient expectations and needs.

Hospital pharmacy leaders in the mid-1960s recognized the drug-related patient problems inherent in such a hospital medication system and set about to make changes in systems and professional relationships. Drug distribution systems were

changed with the implementation of unit dose and i.v. drug admixture services. Pharmacists' practice in patient-care areas was directed at the clinical use of drugs. The composite of these changes in systems and services has become known as clinical pharmacy.

Clinical Pharmaceutical Services

A comprehensive clinical pharmacy program includes pharmacist clinical practice, a clinical drug information service, and a clinical pharmacokinetics service. These services place the pharmacist in the arena of (1) helping to ensure appropriate clinical outcomes of patient drug therapy, (2) active interprofessional relationships with physicians and nurses, and (3) a practice in the environment of the patient's bedside. Pharmacist drug knowledge is focused on the biological, chemical, and clinical aspects of drug use.

Pharmacists' clinical activities have been developed since the mid-1960s and are being performed in many hospitals in the United States. Such activities include

- Interpreting, questioning, and validating drug orders
- Monitoring patients' drug therapy
- Managing selected drug therapies (e.g., aminoglycosides, heparin, aminophylline, parenteral nutrition)
- Providing pharmacokinetic consultations
- Detecting and reporting drug allergies and adverse drug reactions
- Providing drug-use education
- Answering drug information requests
- Conducting patient interviews
- Participating in patient-care rounds
- Participating in cardiopulmonary resuscitation efforts
- Performing drug-use review and patient-care audits
- Performing drug therapy research

These clinical services have been proven to be accepted and used by physicians and nurses,[17-21] to improve the safety and quality of patient care,[18,21,22] and to reduce the costs of patient care.[17,21,22] The documented success of clinical pharmacy services has resulted from the drug knowledge and clinical competence of pharmacists, the implementation of drug distribution systems to maximize pharmacists' time for clinical practice, the desire and commitment of pharmacists to provide clinical services, and the use of technical pharmacy personnel for drug distribution tasks. Additional contributing factors have been cooperation between physicians, pharmacists, and nurses; support from hospital administration; and managerial competence of pharmacy managers.

Today, the number of patients who need clinical pharmacy services is far greater than the number who actually receive the benefits of such services.

The John W. Webb Visiting Professorship in Hospital Pharmacy was established in 1985 at the College of Pharmacy and Allied Health Professions at Northeastern University, Boston, Massachusetts. Webb was Director of Pharmacy at Massachusetts General Hospital from 1959 until his retirement in 1983. After receiving Bachelor of Science and Master of Science degrees from the Massachusetts College of Pharmacy in 1949 and 1951, respectively, Webb was Director of Pharmacy at Hartford Hospital and worked at the University of Connecticut before returning to Massachusetts General Hospital in 1956 to become Assistant Director of Pharmacy. Webb also served as director of the graduate program in hospital pharmacy at Northeastern from its inception in 1964 until his retirement. He is the author of numerous contributions to the pharmacy literature.

A hospital pharmacy practitioner is appointed to the visiting professorship each year by the dean of the college in recognition of his or her commitment to hospital pharmacy management, experience as a practitioner and educator, and dedication to publishing management-related articles. The visiting professor presents a lecture on excellence in management to hospital pharmacy practitioners and students in the graduate program.

The measurement of management excellence in the profession has to be that all patients who need clinical services receive them.

Management Requirements of a Clinical Services Program

The management of a clinical pharmacy program has some unique aspects.

Attitude and Behavior toward Drugs. The first step in the management of clinical pharmacy services is pharmacy managers' possession of an attitude that drugs have substantial potential to cause harm to patients. For the past 50 years, drugs have made many important contributions to the successful treatment of disease and the prolongation of human life. Yet, at the same time they can and do cause morbidity and death to many patients.

A manager of a clinical pharmacy program must believe in and be committed to the concept that pharmacists have a responsibility to ensure appropriate clinical outcomes of patient drug therapy. Then, the pharmacy manager must demonstrate behavior that results in the implementation of clinical pharmacy services. A manager of a "nonclinical" pharmacy department does not have to possess such an attitude and behavior in order to meet the responsibilities of the job.

Pharmacist Time for Clinical Practice. The manager of a clinical pharmacy program must define a comprehensive list of clinical activities for pharmacists. The expected benefits of each activity

for the patient, physician, and nurse must be described. In developing such a plan, the pharmacy manager will be confronted with his or her own professional philosophy regarding pharmacists' practice. Pharmacists who are not committed to a clinical program cannot prepare or "sell" any clinical program to any health professional or hospital manager. If you do not believe in clinical services, you cannot sell them to anyone or manage such a service.

After the clinical plan is completed, the next step is to define how the services can best be provided. The basic support services of drug distribution, the use of technical personnel, the use of computers and mechanization, the physical facilities, and centralization versus decentralization of services are analyzed to determine how to create and maximize pharmacists' time for clinical practice. The "ultimate" challenge is how to study one's own hospital; to define the patient-related drug problems, the facilities, and the attitudes of personnel; and to decide how best to provide clinical services.

In my opinion, the eventual result of the Hilton Head Conference[23] will be the realization of the need to develop information related to "how to study and analyze a hospital for the implementation of clinical services." Until we get to that point and develop the needed information, no great results will occur.

Clinical Drug Information Service. Pharmacists in clinical practice often are confronted with problems that require use of the medical library and drug references. It is not efficient to have each clinical pharmacist use time to review the literature and develop answers to all the drug therapy problems identified.

A centrally located drug information service, staffed with professional and clerical personnel, will extend the pharmacist's clinical practice capabilities. In addition to support for direct patient care, the drug information service staff can provide reviews of new drugs and technology for presentation to the pharmacy and therapeutics committee and medical staff for drug formulary decisions. The management challenge is to obtain resources to establish a drug information service or at least obtain access to an established service at another facility.

Clinical Pharmacokinetics Service. Currently, there are more than 25 drugs that have a narrow range between their therapeutic and toxic dosages. These drugs can be monitored by drawing a blood sample, measuring the drug concentration, interpreting the laboratory results, and then modifying the drug's dosage or dosing interval if needed. A pharmacy-based clinical pharmacokinetics service will manage the information required to ensure appropriate clinical outcomes for these selected drugs. The requirements of the pharmacokinetics system include accurate drug administration at the scheduled time, a pharmacist scheduling the time the sample is to be drawn, accurate laboratory results, and a pharmacist interpreting the laboratory result and recommending to the prescriber if the dose should be changed.

The unique management challenges are developing the systems and resources to provide a pharmacokinetics service; obtaining the cooperation of the medical and nursing staffs, the laboratory, and pharmacy personnel; and achieving the understanding by physicians, nurses, and pharmacists of the clinical application of pharmacokinetic principles.

Drug Distribution Support Systems. Clinical pharmacy services require drug distribution systems that result in the patient receiving the appropriate dose at the proper time. Pharmacist time for clinical practice can be maximized by the development of efficient drug distribution support systems. Unit dose systems have been an important step forward to increase the efficiency and safety of the hospital medication system. Pharmacy managers need to design unit dose systems with the greatest efficiency and with maximal use of technical personnel.

The management challenge now is to develop capable and adequate numbers of technicians, as well as mechanical, robotic, and automated applications for the drug distribution support system. Such methods will minimize the pharmacist's time in drug distribution and maximize time for clinical activities.

Interprofessional Relationships. Pharmacist practice located in the central pharmacy results in minimal day-to-day working relationships with physicians. The working relationships with nursing can best be described as confusing, strained, and even antagonistic, as each discipline does not fully understand the operational needs of the other. Communications are by telephone or intercom (or even nonexistent), and conflict often predominates.

Pharmacists who practice clinically in the patient-care areas work on a face-to-face basis with physicians and nurses. Communications are direct and person-to-person. Cooperation, understanding, and quality services for the patient are the results.

A management challenge in implementing a pharmacist clinical practice is to gain the understanding and support of physicians and nurses. Pharmacy managers must understand that the justification for pharmacist clinical services is based on the inadequacies of physicians and nurses to prescribe, administer, regulate, and monitor drug therapy safely and effectively. To gain support from the physicians and nurses without making them defensive and antagonistic is a unique management challenge.

To develop effective ongoing professional rela-

tionships between pharmacists and physicians and pharmacists and nurses requires respect for each other's profession, clinical drug knowledge, communication skills, ability to work with people, honesty, credibility, and responsiveness to the needs of the other professionals. To develop a pharmacist staff that can meet these requirements is a management challenge.

New Drugs and Technology. A clinical pharmacy program is confronted with the necessity for pharmacists to keep up with the latest developments in new drugs and technology. Worldwide over a recent two-year period, 104 new drugs were approved for patient use. In the United States last year, the Food and Drug Administration approved 25 new drugs. These new drugs are more complex to use than the "older drugs." The risks associated with their use often are greater. New drug-delivery systems and drug administration are more complex. Patient benefits often are also greater. The costs of these new drugs and resources to monitor their clinical response are much greater.

The need for pharmacists to keep up on new drugs and technology and to be recognized and used as experts on drugs is a big challenge before each pharmacist. The management challenges are the development of an organized approach to help staff pharmacists to meet this challenge and then to share their knowledge and information with the medical and nursing staffs. Physicians and nurses need to know and understand new drugs and technology to help ensure appropriate clinical outcomes of patient drug therapy.

New drugs and technology in the next few years will require hospitals to develop and implement a comprehensive clinical pharmacy program. New drugs and technology will lead physicians and nurses to support such a pharmacy program.

Quality Assurance of Clinical Services. Quality services depend on the drug knowledge and skills of the clinical pharmacists. Clinical drug knowledge, ability to communicate knowledge, ability to work well with others, and performance results are some essential capabilities of the clinical pharmacist. Pharmacy managers cannot assume that every pharmacist can perform clinically. The pharmacy director is responsible for all pharmaceutical services; therefore, specific plans must be made to attract qualified pharmacists and then evaluate the performance of each clinical pharmacist. Some clinical programs are now requiring pharmacy department certification of competence for selected clinical activities.

The pharmacy manager and clinical pharmacist must accept the fact that clinical services affect patient outcomes. Clinical pharmacy is serious business. The unique management requirement is to demand and ensure the quality of the clinical performance of each pharmacist.

Cost-effectiveness of Clinical Services. From the beginning, clinical pharmacy services have been challenged by hospital administration, physicians, and nurses to prove cost-effectiveness. Clinical pharmacy leaders for the past 20 years have struggled with this demand. Great strides have been made in the past five years to prove the cost-effectiveness of clinical pharmacy. At Memorial Medical Center, for example, we have demonstrated the following[a]:

1. *Heparin.* Bleeding complications when a pharmacist regulates therapy are fewer than when a physician regulates therapy.
2. *Aminoglycosides.* Incidence of nephrotoxicity is much lower when a pharmacist regulates therapy.
3. *Aminophylline.* Toxicity is much less when pharmacist regulates therapy.
4. *Pharmacokinetics.* Drug concentration determinations are appropriate, and waste from inappropriate determinations has been virtually eliminated.

Hospitalization costs for the treatment of toxicities from these drugs, inappropriate drug concentration determinations, and adverse drug reactions would have been $1.0 million greater than the costs for providing these pharmacist clinical services. One recent study at Memorial on physician prescribing errors documented the clinical pharmacist's ability to stop the errors from occurring. Some errors were life-threatening, and all would have led to toxicity, morbidity, and increased hospitalization costs.[22]

The management challenge is for each clinical pharmacy program to document and evaluate the cost-effectiveness of the services provided.

Pharmacy Personnel. The unique management challenge relating to pharmacy personnel is the recruitment and retention of pharmacists and technicians who are knowledgeable and who can work cooperatively with physicians, nurses, other hospital personnel, and each other. Pharmacy personnel in a clinical program practice in the patient-care areas and are in frequent contact with other professionals. Their conduct and performance must gain the support and confidence of physicians and nurses.

If educated and trained personnel cannot be recruited, then the management challenge is to provide the necessary education and training of existing staff for their new clinical practice. This education and training effort can be successful if it is planned properly, if time is made available for the staff, and if the staff members have the desire and motivation to learn and change their practice.

A clinical pharmacy program of excellence requires good people, and the recruitment and retention of good people is a constant management challenge.

Future Management Challenges

I believe it is important for pharmacy managers

to give some thought to what the key challenges will be in the 1990s. Gearing performance toward these challenges could result in great achievements in clinical services and is necessary if the profession is to achieve excellence in management.

Pharmacy Workload and Limited Resources. The price-competition environment in health care, the declining rate of payment for services provided, and the phenomenon of continual substantial pharmacy workload increases are powerful forces that are in direct conflict. Every pharmacy director I have talked with over the past five years has confirmed the continual increase in drug-distribution and clinical workloads and at the same time the increasing difficulty in obtaining additional resources. Many pharmacy directors are confronted with dollar tradeoffs between cost of drug products and payroll for staff and services. Several pharmacy programs have been dismantled, many others are going through radical changes in an attempt to cope, and many more will soon be struggling with the need to add staff or make major changes in programs.

All pharmacy personnel—educators, pharmacy managers, pharmacists, and pharmacy technicians—must understand that how we all cope with this challenge will be a key factor in what pharmacy services will become in the years ahead.

New-Drug Knowledge and Clinical Competence. The recent and future new drugs and drug technologies will place increased demands on professionals to provide safe and appropriate drug therapy.[24] Pharmacists must continue to provide clinical services based on their drug knowledge. Each pharmacist is confronted with the challenge of how to maintain clinical competence. Where is the time going to come from to study, perform clinical research, and attend conferences? Each pharmacist needs to develop his or her own plan, including the commitment of personal resources of time and money, for meeting this challenge. The pharmacy department management must develop strategies and programs to assist staff members in maintaining clinical competence.

Planning of Clinical Services. There is a critical need within pharmacy to define the essential clinical services that need to be provided to patients in all types of patient-care settings. What pharmacist services do primary-, secondary-, and tertiary-care patients need? What pharmacist services do ambulatory, home-care, and skilled-nursing-facility patients need? What will the pharmacy service needs be for these patients in the 1990s? Planning of pharmacist services by patient-care types and settings is a challenge for pharmacy managers and educators if the profession is to meet its mission to provide all drugs and to help ensure the appropriate clinical outcomes from drug therapy.

Another type of pharmacy service planning will result from the success of clinical services. As a clinical program matures, demands from medical and nursing staffs for clinical services will increase. Because of resource limitations, an interdisciplinary planning effort will be required to assess clinical services for continuation, discontinuation, and additional new services. Such a planning effort is in progress at Memorial Medical Center and is to be completed by early 1988. It is too soon to tell what the probable outcomes will be, but a redefinition of clinical services with the backing and support of both the medical and nursing staffs will be achieved.

Another type of pharmacy service planning is the development of a multiyear plan. The changing health-care environment and the changing goals and objectives of an institution will require the pharmacy department to make plans to adjust and change with the institution. The multiyear-plan effort will focus on services, facilities, personnel, equipment, and management of the pharmacy department. Without such planning, the pharmacy service runs the risk of being left out or of lagging behind where the institution is going in its future.

Managers' Ability To Cope with Rapid Change. Health-care services in the United States are in the midst of a revolution involving what is provided, how services are going to be provided and by whom, and what the rate and method of payment for services are going to be. Existing pharmacy managers are confronted with conflicts and dilemmas in how to meet their responsibilities for the organizations in which they work and to achieve professional objectives. Often, it just does not seem to be enough, no matter how many hours are worked or how many objectives are achieved. The rate of change has been phenomenal and will continue to be so for the rest of this century. Therefore, how present and future pharmacy managers are able to cope with a managerial climate of rapid change will be a major factor in the growth of clinical practice and services in pharmacy.

Conclusion

The pharmacy manager's basic function is to identify the opportunities for clinical services, establish the objectives to provide clinical services, and obtain the required resources. The past and present management capability within pharmacy has been and continues to be a barrier to the implementation of clinical services.[23] Extensive use of pharmacy technicians, documentation and evaluation of the cost benefits of clinical services, effective pharmacy and therapeutics activities, and obtaining the necessary resources on an ongoing basis for clinical services are examples of essential pharmacy-manager results.

It has been 22 years since my first opportunity to design, implement, and manage a clinical pharmacy program. It has been a fascinating time filled

with many interesting experiences. I have learned that the greatest unique requirement for managing a clinical pharmacy program is an ability to cope with change. People, and especially pharmacists, are resistant to change. Too many pharmacists are fearful of clinical practice. It is a radical change from the traditional role of a dispenser of medications. If the profession had spent as much time deciding why and how to implement pharmacist clinical services during the past 20 years as it spent giving all the reasons not to change, the pharmacy profession worldwide, and patients worldwide, would be a lot better off today.

A clinical pharmacist has to know more about drugs, be visible and share knowledge with physicians and nurses, and be held accountable for clinical decisions. It is not easy to make such a change in one's professional practice, but it is worth it, and it must be done.

The demands on pharmacy managers from the increasing complexity within health care result in many challenges, opportunities, and potential conflicts. Financial pressures, interprofessional relationships, and forces internal to pharmacy all have to be dealt with by the hospital pharmacy manager. The resolution of quality of drug care and at what cost (i.e., the provision of clinical pharmacy services) will be tough to deal with. Pharmacy management now and for the next decade is not for the faint-hearted or weak-kneed.

The pharmacy manager's job for the successful implementation and management of clinical services is to manage the "people aspects" of change; to obtain the resources of pharmacists' time, space, reference materials, and support systems; and to then design the operational systems that will achieve comprehensive drug-use control and appropriate patient outcomes from drug therapy. Pharmacists must step forward and accept the challenges that result from the unique requirements for managing a clinical pharmacy service.

Excellence in the management of a clinical pharmacy service is measured by the benefits received by patients, physicians, and nurses and the job satisfaction achieved by the pharmacists providing clinical services. It will be interesting to see in the year 2000 just how many patients who deserve and need pharmacists' clinical services are in fact receiving them. Today, too few patients are receiving the benefits of such pharmacist services. If patients are not receiving the benefits, then the drug-related patient problems will be those of the 1960s, plus more due to the new drugs and technology.

Excellence in the management capability of the profession will be measured by the extent to which patients receive the benefits of pharmacists' clinical services. The challenge before each pharmacist—clinical staff member and manager—to meet his or her mission as a health professional will take a serious and sustained effort. The patients deserve our very best effort.

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