

2006 marked the 40th year of publication for *The Annals*. Throughout its history, *The Annals* has provided important contributions to the development of clinical pharmacy. In 2007, we are continuing to publish articles reflecting on the history of clinical pharmacy through the eyes of practitioners, including those pioneering clinical pharmacy, as well as those who have more recently entered the profession and a well-established specialty. In addition, we are presenting articles and editorials from the early history of *The Annals* that have given direction and shape to the practice of clinical pharmacy (see page 329).

Clinical Pharmacy: Reflections and Forecasts

William E Smith

Four decades have sped by since my beginning in clinical pharmacy at the University of California–San Francisco (UCSF) School of Pharmacy, 9th floor Pharmaceutical Services project. Over these 40 years, clinical pharmacy has been the dominant focus in my professional career of practice, teaching, service, and scholarship. The ultimate driving force has been the belief that every patient who needs the clinical drug knowledge and skill of the pharmacist does in fact receive the services. In 2007, we are still a long way from realizing that goal of every patient receiving pharmacist clinical services when needed. Although there are many reasons for pharmacy's failures in the expansion of clinical pharmacy services, this article highlights several views and experiences about clinical pharmacy since 1965. Some comments about the future of clinical pharmacy are also provided.

In the mid-1960s, several factors came together that resulted in efforts to change pharmacy medication systems in hospitals. These factors included medication errors, drug–drug interactions, adverse drug reactions, drug-induced diseases, drug information needs of physicians and nurses, and drug-related causes for hospital admissions. During this same time period, pharmacy education had

started to change to the PharmD curriculum, led by 2 California schools of pharmacy and followed by other leading schools of pharmacy. The PharmD education received at that time, while not clinical, was another significant factor leading to the change in practice, as students wanted to use their PharmD education more in their practice as pharmacists. New medication systems were developed at the University of Arkansas and The University of Iowa. The new University of Kentucky Medical Center opened in 1964 and was the first to use a hospital-wide unit-dose medication system. The first Drug Information Center also started at the University of Kentucky. Intravenous drug admixture services were developed by The Ohio State University. The University of Wisconsin was a leader in developing new systems for pharmacy services. The concept of a “satellite pharmacy” was published in 1960 and 1961 by hospital administrator Donald C Carner, as he led the design of the new Long Beach Memorial Hospital (LBMH) in California. Other projects directed at pharmacist clinical services were occurring in South Carolina; North Carolina; Galveston, Texas; Philadelphia and Pittsburgh, Pennsylvania; Wisconsin; and Kentucky. It was the 9th floor Pharmaceutical Services project at UCSF that became generally recognized as the leader in the aggressive effort to design and establish pharmacist clinical services.

The 9th floor at UCSF was a 58 bed general surgical floor. It was an experimental floor where any hospital department was welcome to participate and propose new

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ways of providing services to the patients and professional staffs. The planning of the 9th floor pharmacy project started in October 1965. The initial question before the planners was, "What will the pharmacist do?" Ideas were collected from discussions with faculty and with the surgeons and nurses assigned to this project, from ideas of the project coordinator that had come from his PharmD and residency education at UCSF, and from the professional literature. The initial set of pharmacist practice activities included: attendance at patient-care teaching rounds and conferences, recording of patient drug history upon admission, monitoring for drug-drug interactions, answering drug therapy questions for physicians and nurses, drug therapy counseling at hospital discharge, and participation with the cardiopulmonary resuscitation team. Unit dose and intravenous drug admixture systems and 24 hour service to the medical center were provided by the 9th floor pharmacy staff and pharmacy technicians. Within a short period of time, as significant clinical contributions were being made in caring for several patients, nurses and physicians were asking pharmacists more complex patient drug information questions, nursing time due to medication activities was reduced by 50%, and patients received their pain medications almost immediately because the medication cart was being taken into the patients' rooms. The 9th floor project was successful beyond the planners' hopes and expectations. Visitors came to the 9th floor pharmacy from California hospitals, hospitals in other states, schools of pharmacy, and the pharmaceutical industry; soon, pharmacists from other countries also began to visit. The success of the 9th floor project led to the establishment of the Drug Information Analysis Service and the implementation of clinical clerkship teaching at UCSF. Presentations about the 9th floor were made at national and state pharmacy association meetings starting in 1967.

In the late 1960s, expansion of pharmacist clinical services was an increasing interest and emphasis within hospital pharmacy. Expansion of pharmacy student clinical education also received an increasing emphasis within pharmacy education. The satellite pharmacy program at LBMH, conceived by the hospital administrator and supported by the nursing director, began to see pharmacists in clinical practice in 1965–1966. Clerkships for pharmacy students from the University of Southern California also started in 1965–1966, led by the medical director and pharmacists in clinical practice. The decentralized pharmacy program achieved hospital-wide status in early 1968. By the early 1970s the pharmacy program at LBMH included the following pharmacist clinical services: pharmacist attendance and participation in patient care rounds and conferences, monitoring of patients' drug therapies for drug interactions and concurrent drug therapies, furnishing of answers to drug therapy questions from physicians and

nurses, management of drug therapies according to guidelines as delegated by the private medical staff, making of presentations at medical grand rounds, drug utilization reviews, membership on Code Blue teams, and teaching of pharmacy students and residents. The decentralized pharmacists' clinical practice was supported by a drug information service that was staffed full time with extensive drug information resources. The support of the private medical staff and nurses, as well as the economic feasibility (ie, personnel costs) for the decentralized clinical pharmacy services, were documented in a research study funded by the federal government in 1972. The pharmacy program continued to grow in the 1970s with the implementation of a full-time clinical pharmacokinetics service and significant expansion of more drug therapies managed by the pharmacists. The pharmacy program at LBMH achieved an extensive pharmacist clinical presence due to the following key factors: support from hospital administration, nursing, and medical staff; leadership from the pharmacist staff for clinical practice; a pharmacist staff dominated by those with a PharmD and residency education; clinical drug support services and staffing in the drug information service and clinical pharmacokinetics service; extensive use of pharmacy technicians; pharmacy leadership and management; documentation of clinical services and presentation to administration and medical staff leadership; service commitment to patients, nurses, and physicians; and financial rewards for clinical practice. By the end of the 1970s, the clinical pharmacy program at LBMH was comprehensive, consisting of a pharmacist clinical practice, a drug information service, and a clinical pharmacokinetics service. Several national awards for the clinical pharmacy program were received. Pharmacy visitors from hospitals and schools of pharmacy in the US were frequent and large in number. Pharmacists from hospital pharmacies and schools of pharmacy from over 30 countries also visited the clinical pharmacy program.

Similar expansion and success of clinical pharmacy programs occurred in many programs throughout the US, as well as in Japan, Australia, Canada, and Europe.

In the 1980s and 1990s, several forces within pharmacy and the economics of health care led to decrease in clinical pharmacy services. The continual growth in costs of health care led governments and business to apply pressure to control and reduce these rising costs. Pressure to reduce the number of employees in hospitals reached new heights and a benchmarking system of hospital operations evolved, including the pharmacy department. Consultants descended on the hospitals with their comparative databases for benchmarking, and the concept of 25th percentile as best practice was born. Meanwhile, employees continued to want annual wage increases, and suppliers—including pharmaceutical manufacturers—raised the costs of their

products and services. The net impact on clinical pharmacy services in hospitals was curtailment and, often, reduction in services and staffing. The benchmarking systems did not include pharmacist clinical services in their databases to any great extent, which is still the case today. Many clinical programs were reduced and, in some cases, eliminated. Other factors for this reduction in pharmacy services and staff were the inadequate documentation and evaluation of pharmacist clinical services and pharmacy's move toward "pharmaceutical care" and away from "clinical pharmacy." Advocates of pharmaceutical care labeled clinical pharmacy as pharmacist services for physicians and not for patients. This is an inaccurate view, in my opinion. Failure of pharmacy education to move to the PharmD degree was another contributing factor for limiting the expansion of clinical pharmacy. The profession's struggle and failure to aggressively recognize and utilize pharmacy technicians also hindered the expansion of clinical pharmacy, especially in community and outpatient pharmacy.

In 2007, clinical pharmacy has a mixed status. Whenever and wherever clinical pharmacy programs have evaluated the provided pharmacist services, the results have been cost-effective care and strong support by physicians and nurses. However, the rising cost of care continues to place emphasis on drug distribution workload and benchmarking systems that lack clinical pharmacy data. Automation of medication systems and pharmacy operations dominates the work of pharmacy managers, and very little time is allocated to developing and managing pharmacist clinical services. Automation of pharmacy operations can generate more pharmacist time for clinical services. The rising cost of drug products continues to be viewed and budgeted as a pharmacy department cost. It continues to be easier to increase the drug budget and not the pharmacy personnel budget for professional services. Several recent national reports, such as those from the Institute of Medicine, National Quality Forum, and the Joint Commission on the Accreditation of Healthcare Organizations, have placed medication errors and patient medication safety squarely on the front burner, as they were some 45 years ago. Included in these reports are recommendations for pharmacist clinical services that have been proven to be of value over the past decades. Several national pharmacy associations have developed vision statements for the profession for 2015. Careful reading of these vision statements suggests moving the majority of pharmacist practice into clinical services for patients, physicians, nurses, and other healthcare personnel.

The state of clinical pharmacy in 2015–2020 will be determined largely by the focus and collaboration between pharmacy leaders and the schools of pharmacy directed at the many internal and external forces on pharmacy practice and patient medication safety. Some important factors include the following.

1. The vision statements by the Joint Commission of Pharmacy Practitioners and American Society of Health-System Pharmacists will transform the majority of pharmacist work time to clinical practice. The plans, strategies, and research to change the focus of pharmacist work are critical and complex. For example, if a majority of pharmacists and pharmacy students do not believe in clinical services and do not believe that they are capable of performing pharmacist clinical services, it is unlikely that the vision of pharmacist clinical practice will be achieved.
2. If compensation for pharmacist clinical services is not obtained, achieving the vision is unlikely to happen.
3. The future impact of all PharmD education should be an internal force to move clinical pharmacy forward. Over time, more pharmacist graduates are going to want to use their clinical education and will push for practice models, similar to the early developers of clinical pharmacy 40 years ago.
4. Automation of pharmacy operations and drug systems will continue to evolve to assist with improving patient safety. How technology can be used to support pharmacist clinical services is an important question. How technology can be used to educate pharmacy students in pharmacotherapy is another important question.
5. New drugs and drug-related technology will increase the demand and need for pharmacist clinical services for patients and prescribers.
6. Patient medication issues and concerns will continue to land at the feet of pharmacists. Efforts of pharmacists to stay on the sidelines or be minimally engaged will not achieve the needed and desired level of patient medication safety.
7. Pharmacy leaders and managers need to possess a commitment to pharmacist clinical services that will be reflected in the administrative decisions they make.
8. Research of pharmacy practice, including pharmacist clinical services, is essential and critical for achieving safer patient medication use.

The ultimate goal of clinical pharmacy has been and still is "every patient who needs the clinical drug knowledge and skill of the pharmacist does in fact receive the services." The continued pursuit of meeting this goal by 2015–2020 deserves the attention and best efforts of pharmacists, pharmacy students, and pharmacy faculty. A great deal can be learned from a serious revisit to the beginning of clinical pharmacy and its accomplishments over the past 4 decades. The goals identified and the energy put forth by the developers of clinical pharmacy are relative and important to today's challenges of patient medication safety, cost-effectiveness, and appropriate use of medications. The developers of clinical pharmacy were focused on services for the patient, physicians, and nurses. Medication systems

were designed to support pharmacist time for clinical practice and promote patient safety. The developers of clinical pharmacy were driven to enable pharmacists to use their drug knowledge in the clinical care of patients. They possessed a can-do attitude; obstacles and roadblocks were overcome to achieve their objectives. They were results-oriented, assertive, and not passive about getting involved and increasing their responsibilities for drug use control. They had the energy to work and do whatever it took to accomplish their objectives. They were not afraid to do the self-study required to educate themselves in areas in which they lacked knowledge when working in clinical practice. They did not wait for issues and situations to be perfect before moving forward into direct patient-care settings. Answers to the many pharmacy challenges of today and the future can be found in the development and growth of clinical pharmacy over the past 4 decades.

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