

changes in our concept or the prototype, we immediately submitted the column to *DICP*. Don Francke, without any hesitation (at least from our vantage point), accepted our proposal and the column was initiated.

We were in for a few surprises, not the least of which was the constant pressure of monthly deadlines. We really underestimated the time commitment. As a consequence, much of the preparation was done after hours. Another was the quick and enthusiastic feedback we got from readers of the column, which really helped to keep us motivated. I also remember the effect that it had on students and residents. The potential for participation seemed to energize many of them.

The fact that the column continues to be published regularly more than 20 years later seems to confirm the validity of the original concept. The concept also has not been fundamentally changed by successive column editors, a testimony to their collective wisdom not to fix what is not broken.

The significance of the column's longevity probably lies in the fact that it has reported real experiences that can be embraced as such by the readers and has never tried to be anything else. The hard way to learn anything is through one's own experience. It is easier to learn from somebody else's experience. I think that is the enduring appeal of "DIAS Rounds."

THE ORIGINS OF THE CLINICAL PHARMACY PROGRAM AT THE UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Robert L. Day, Jere E. Goyan, Eric T. Herfindal, and Donald L. Sorby

DEPENDING UPON TO WHOM ONE TALKS and his memory or objectivity, the School of Pharmacy at the University of California, San Francisco (UCSF), has been credited with being either the major pathfinder or one of many trailblazers in the development of the clinical practice role of the pharmacist. The purpose of this article is to neither fortify nor blur either distinction, but rather to share some events that took place slightly over a quarter of a century ago that led to an entirely new kind of curriculum and graduate at UCSF, as fondly recalled by a few of the dozens who, in one manner or another, participated in and survived its development. Due to the restraints of time and space, this article will only skim the historical surface; for this reason the authors apologize in advance to any individual, school, or organization whose contribution could not be acknowledged.

In retrospect, that which after some minor internal bickering would become known as clinical pharmacy at UCSF could not have chosen a more unlikely period to be conceived or born than the mid-1960s. The problem, to greatly understate it, was that the profession seemed locked on a slow but certain course to extinction. First of all, it was mostly stagnant at a time when stagnation seemed all but impossible. Technology and change abounded, man had

scaled the skies to the moon, but the role of the pharmacy practitioner had barely altered over the previous 100 years. True, there had been some encouraging preliminary developments (the "pharmaceutical center" notion of community pharmacy practice, the emerging awareness that over-the-counter "counterprescribing" was not unethical after all, some preliminary development of patient medication record systems, etc.), but none of these had attracted much of a following. Additionally, the profession was deeply infected with apathy, intra- and interprofessional isolationism, an inferiority complex, and competition that was beginning to sever its most established (and cherished) economic roots. As a net result, it was politically impotent and it was ignored not only by other health professions, but the federal policy-setters who were making decisions that would drastically and adversely affect its future.

Although pharmacy education, in the main, suffered from similar maladies, it, too, had not been entirely idle. For years, a handful of schools had conceptualized new roles for pharmacists, most of which were linked to the dispensing act. Heading their wish list was a Holy Grail role that had eluded them for the better part of three decades: the pharmacist as a participant in the drug-prescribing process. The difficulty was that everyone had a different idea of what this kind of practitioner would do and although much was said, no one actually had the slightest clue as to how he or she should be educated.

The UCSF School of Pharmacy was a prime example in this regard. Between 1950 and 1964, it made a heavy commitment to its vision of a drug expert (in some quarters

ROBERT L. DAY, Pharm.D., is the Associate Dean, School of Pharmacy; JERE E. GOYAN, Ph.D., is the Dean, School of Pharmacy; ERIC T. HERFINDAL, Pharm.D., is the Chairman, Division of Clinical Pharmacy, School of Pharmacy, University of California, San Francisco, and Director, UCSF Medical Center Hospital and Clinic Pharmacies; and DONALD L. SORBY, Ph.D., is the Dean, School of Pharmacy, University of the Pacific, Stockton, CA. Reprints: Robert L. Day, Pharm.D., School of Pharmacy, University of California, San Francisco, CA 94143.

called a drug consultant). In response to a flood of new drugs, almost universally unreliable information regarding efficacy, and an increasing expertise/concern in the soon-to-explode area called bioavailability,⁸ it had developed a six-year doctor of pharmacy curriculum that was intense in the biological, chemical, and physical sciences. Included were hefty courses in biopharmaceutics, physiology, biochemistry, gross anatomy, microbiology, parasitology, pathology, and a lecture course entitled "Orientation to Medicine" presented by physicians who exposed students to diagnosis, treatment, and the decision-making of prescribers.

The intended purpose of the curriculum was to train students to be knowledgeable in all aspects of the drug *product*, i.e., from its basic chemical/physical/biological properties to its ultimate formulation in a dosage form. Graduates of the program were expected to be able to assist prescribers in selecting the most effective drug therapy by means of their knowledge of how one agent compared chemically to another; what impact, if any, minor variations in chemical structure could have on disposition and efficacy (etc.); and the influences that the various ingredients constituting the drug product might have upon absorption. It was also anticipated that some, if not many, graduates would be interested in working for the pharmaceutical industry.

By the early 1960s, several members of the UCSF faculty—among them Associate Dean Jere E. Goyan, Ph.D., Department of Pharmacy Chair and Vice Chair Sidney Riegelman, Ph.D., and Donald L. Sorby, Ph.D., respectively—had become convinced that the school's latest educational experiment was not accomplishing its proposed purpose. Although the current curriculum provided its graduates with an excellent science base, few had met the expectations of its designers. In part, the problem—as noted in a later report—was:

[Although] the concept of the pharmacist as a drug consultant was stressed and attempts were made to instruct the student in how his pharmaceutical knowledge related to patient care . . . the faculty had no opportunity to test their techniques of instruction for there was no laboratory at that time where the students could put their training into practice.⁹

In plainer language, no such role existed.

When Goyan, Riegelman, and Sorby met in the early fall of 1965, they were already aware of various experiments that had been conducted at a few universities. Kentucky, Arkansas, and Iowa, for example, had worked on decentralized unit-dose systems and Kentucky had established a drug information center in which David Burkholder, Pharm.D., armed with selected compendia, provided various kinds of information to prescribers. It occurred to the threesome that projects of this kind provided the pharmacist with legitimate access to patient care areas where his skills could be tested, and better yet, where there would be an opportunity to look around for things to do. The aforementioned "laboratory" appeared to have presented itself.

Sorby and Riegelman had brought with them a draft proposal that the school "participate in the establishment and staffing of . . . drug stations"¹⁰ on various floors of UCSF's Moffitt Hospital, a 560-bed tertiary-care facility. In their view, aside from relieving nurses of certain drug-related

duties, such a project would "make it possible for the physician, if he so wishes,¹¹ to discuss drug usage with the pharmacist at the time the decision is being made." The proposal also suggested that the drug stations would provide students with "adequate experience in applying [their] scientific and professional knowledge, gained in the classroom to the practical aspects of drug usage in therapeutic situations."¹² Thus, from the moment the decentralized, pharmacies (drug stations) were conceptualized, they were envisioned as serving a joint teaching/service function, a model that would serve the school well as the years passed.¹³

By the time the meeting adjourned, the participants agreed that the school and the campus should commit themselves in a major way (i.e., funds) to the proposed project.

Within days, Goyan obtained the approval of then-Dean Troy C. Daniels, Ph.D., and it was now time to convince campus administration, including Moffitt Hospital administration, which would have to provide partial funding and space. Although a knowledgeable outsider might have speculated that the school had a persuasive advantage—pharmaceutical services were the joint responsibility of the school and the hospital—the fact of the matter was that the school had little influence in this regard. With the exception of the pharmacy internship (now residency) program that had been established in the 1940s, pharmaceutical services and the school were basically independent of each other. Although Donald C. Brodie, Ph.D.,¹⁴ had the title of Director of Pharmacy, the day-to-day responsibility for managing the pharmacy rested with Eric Owyang,¹⁵ Chief Pharmacist. Owyang was highly supportive, even enthusiastic about the project from its inception; however, many of his staff were not. Thus, some of the proposed project's strongest opponents were pharmacists themselves.

Goyan and Daniels, therefore, realized that if the idea was to receive the approval of several levels of skeptical administrators, it would have to be on the basis of its merits. The problem, of course, was that the project had no proven merits; it was, after all, an experiment—and an expensive one at that—with no precedent anywhere. If this had been a poker game, one might rightfully have concluded that Goyan and Daniels were holding a weak hand; both realized, however, that they had an ace up their sleeves: the school's excellent research reputation in the UCSF academic community. In the meetings that would follow and during the first crucial years of the clinical program, it was the school's credibility in this regard as much as its clinical successes that gained it influential, thoughtful ears as it sought first to maintain, and later to expand its clinical pharmacy programs.

As the next step, Goyan and Daniels met with then-acting chancellor and surgery department chair, J. Englebert Dun-

⁸This cautious, even diplomatic, qualifier conveys as well as anything how little was known in the 1960s about physician need or willingness to seek assistance from pharmacists.

⁹With this basic concept, the school avoided the pitfalls encountered by some later pathfinders of clinical pharmacy, who convinced hospital administrators to fund such projects on the basis of contributions to service and later, when such services were established, experienced varying degrees of difficulty in convincing administration to permit students in the service.

¹⁰Now Professor Emeritus, UCSF School of Pharmacy, and Professor Emeritus, University of Southern California School of Medicine, Los Angeles, CA.

¹¹Now Clinical Professor, UCSF School of Pharmacy.

¹²Gerhard Levy, Eino Nelson, and Sidney Riegelman, a student and two faculty members, respectively, were pioneers in this area.

phy, M.D. He approved the project and suggested that his surgical service on the 9th Floor of Moffitt Hospital would be an appropriate test site because it would complement an experiment being conducted by UCSF Nursing Services. The goal of the nursing experiment was to improve the quality and efficiency of nursing care and a minipharmacy would likely be welcomed for its potential in cutting down drug-acquisition time and nurse frustrations associated therewith.

William E. Smith, Jr., then a UCSF pharmacy resident,^f was assigned the responsibility for performing the preliminary footwork and coordinating the implementation of what was now called the "9th Floor Pilot Project." A committee, composed of Smith, four nurses, a surgeon, and a dietitian, was appointed in November 1965 and met frequently in the ensuing months, carefully planning for the smooth insertion of pharmacists into a team that had functioned without them for more than a century. Paranoias arose and were worked out, forms were developed and approved, and mutual responsibilities were agreed upon, even welcomed.

Initially, it was planned that the floor pharmacy would be open from 7 am to 9 pm, seven days a week; shortly thereafter, this was changed to round-the-clock coverage. What today seems like a simple (although significant) change in schedule, was actually far more than that in 1965, for it represented a cornerstone in the development of clinical pharmacy's role at UCSF. In essence, it was an unambiguous declaration of commitment—a recognition that pharmaceutical care, of the kind being planned, would be needed on a 24-hour basis—and a clear indication that pharmacists were serious about being responsible, contributing members of the inpatient healthcare team.

It was agreed that the pharmacist would receive all orders, fill them if possible from unit-dose stock in the minipharmacy, and dispatch the remainder to the central pharmacy. A word should be said about the state of the art of unit-dose at this time and how it came to be associated with the project. First of all, the state of the art was anybody's guess. A limited number of institutions were experimenting with it, each had its own idea of how it fit into the drug distribution system, and some had already decided that it was either too expensive or just would not work. By no means were its merits/advantages yet known.

One of its major shortcomings was that despite the urgings of the pioneers, very few manufacturers made their products available in unit-dose packaging. Therefore, any institution wishing to establish a unit-dose system had to buy equipment and hire personnel to tediously hand-feed tablets one at a time into a slow, primitive, noisy, strip-packaging machine. A similar process was necessary for liquids. Because such person's attentiveness to detail quickly succumbed to boredom, quality control and employee retention were constant problems. The decision to introduce this yet-unproven system came following a visit in March 1966 by Paul F. Parker,^g who "recommended strongly that the drug distribution system be established on a unit-dose concept and that pharmacy [technicians] be utilized,"³ the latter itself a radical idea.

^fNow Vice President of Pharmaceutical Services, Long Beach Memorial Medical Center, Long Beach, CA.

^gThen Director of Pharmacy, University of Kentucky Medical Center, Lexington, KY.

In addition, the pharmacist would prepare all admixtures (these were previously done by nurses), standardize and regulate time schedules for drug administration, instruct patients on discharge medications, and provide inservice education (topics yet to be discovered) to the nursing and medical staff. Then came an interesting twist: the pharmacist would also establish a "pharmaceutical service record for each patient" (soon to be deemed "patient/drug monitoring"). As might be expected, turf-related paranoias arose but these, too, were worked out, mostly by compromise.

Something was missing, however, something every other health professional had: direct contact with the patient. It could not be of the "hello, how are you today, goodbye" variety, but something meaningful, something drug-related that would contribute to his or her care. But what? The answer came not as the result of a deliberative process, but an accidental encounter with a member of the faculty who had not been involved in the project. Vincent Gardner,^h Ph.D., an instructor in the school's community pharmacy management course, offhandedly suggested to Smith that the pharmacists take a drug history when a patient was admitted. The reason was obvious, and just like that, clinical pharmacy at UCSF crossed the bridge to the patient's bedside.

Smith completed his residency in July 1966 and was appointed to the clinical faculty as project coordinator. In addition, an initial crew of pathfinder pharmacists (Robert A. Miller, Pharm.D.,ⁱ Joseph L. Hirschmann, Pharm.D.,^j and Richard F. deLeon, Pharm.D.,^k) was recruited and Donald Holsten, Pharm.D.,^l then a UCSF staff pharmacist, became the fifth member of the team. All were relatively recent UCSF graduates, purposely chosen because they were the measuring rods by which the strengths and deficiencies of the pre-1966 curriculum would be measured.

Construction of the 9th floor satellite pharmacy was completed in August 1966 and, although services did not actually commence until the first week of September, the school submitted a 42-page grant proposal to the U.S. Department of Health, Education and Welfare (DHEW; now the Department of Health and Human Services). Entitled "The Pharmacist's Role on the Patient Care Team," it would be the first in a long line of proposals that would suffer the same fate, i.e., it would be turned down. The problem, apparently, was that it was too radical for the physician-oriented grant-approving bureaucracy in Washington to accept.

When read today, its objectives hardly seem particularly aberrant; indeed, they strike one as rather basic. But this was 1966, a time when physicians almost entirely controlled the care of a patient and when pharmacists were neither performing nor generally recognized as capable of performing any of the activities proposed:

- To develop a hospital floor-based pharmaceutical service that will provide maximal patient safety in the utilization of drugs.

^hNow a consultant, Vincent Gardner Associates, Austin, TX.

ⁱNow Pharmacist, Merritt Hospital, Oakland, CA.

^jNow Vice President and General Manager, First DataBank, San Bruno, CA.

^kNow Associate Dean, College of Pharmacy, University of Michigan, and Director, Department of Pharmacy Services, University of Michigan Hospital, Ann Arbor, MI.

^lNow Director of Regulatory Affairs, Liposome Technology, Inc., Menlo Park, CA.

- To charge the pharmacist with the responsibility for all phases of drug distribution, except the administration of medication to the patient.
- To provide an unbiased and easily available source of reliable drug information (the pharmacist) and to disseminate information according to the needs of the professional personnel.
- To provide clinical experience for interns and residents and other qualified pharmacy students in hospital pharmacy.
- To design and conduct studies in cooperation with the physician and nurse so that a full evaluation may be obtained of institutional pharmacy service within the framework of the team approach to patient care.

The service opened on September 7, 1966, with no fanfare, but considerable anticipation and anxiety on the part of the unappointed pathfinders. No teaching was conducted during the first year because they were "extremely involved with developing their role in patient care"—a nice way of saying that what could have gone wrong, did. Despite careful planning, the minipharmacy was too "mini," and there were problems in storage and claustrophobia.³ (It was later slightly enlarged.) Because no pharmacist had ever done anything quite like this on an inpatient service, service roles and responsibilities (and perceptions thereof) changed almost daily, as did emotions, senses of accomplishment, paperwork, and the often makeshift, more often make-it-up-as-you-go unit-dose system. Needless to say, it was an intriguing time for all parties, including newly employed nurses, rotating surgical residents, and outside physicians who had not seen the notices describing the 9th Floor Pilot Project and, therefore, wondered what pharmacists were doing there and why in the world they were fiddling around with patient records!

Two weeks into the project one of those dramatic events took place that caused a buzz around the hospital and gained the service a powerful ally. The wife of the campus' leading cardiologist was listed as "critical" from a virulent infection that had been unresponsive to the two antibiotics she had been receiving in an iv admixture. While on rounds, the pharmacist (Holsten) noted that the two antibiotics were physically incompatible and suggested that they be administered separately. When his recommendations were ignored by the surgical resident, he went to the patient's husband who, to put it mildly, immediately influenced a change in the order. Within two days the patient was afebrile and the service had moved one step closer to permanency.

Some seven months later, Smith reported on the progress:

[T]he practice of pharmacy on the hospital floor appears to be a logical and direct method to help solve the various problems associated with modern complex drug therapy and drug distribution. Several members of the surgical and nursing personnel . . . have expressed their acceptance of the pharmacist on the patient care team because he adds to the overall effort of providing care. The pharmacists believe that the type of service developed . . . is the only kind of pharmaceutical service that should exist in the hospital.³

The preceding seven months had also been an exhausting time and a period of discovery regarding relative worth as well. As additionally reported by Smith:

The present work schedule . . . is such that no one would want to work it as a future steady diet. The work day . . . is not only phys-

ically tiring, but the pharmacist is under continual mental pressure to perform at a very high level at all times. [They] also believe that the responsibility they have assumed is not compensated adequately with the present staff-pharmacist salary levels. What I am trying to say is that we have created a very satisfying professional pharmacy practice but not in a manner that anyone would want to make a career of it. Part of this problem—the work schedule—will be solved when more pharmacists are involved in the program.³

As anticipated at the outset, the mere presence of pharmacists stimulated drug-related queries from nurses, intern/residents, and physicians. Not anticipated, however, was the volume, scope, depth, and occasional urgency of the questions, many of which—because this was before the time of computers—required a manual literature search in the campus's extensive medical library. Herein arose a dilemma that at times courted disaster. Although the library was less than five minutes away, a need to go there effectively removed a pharmacist from service for up to one hour. This meant that routine activities (including the unit-dose and iv additive system) were disrupted and sometimes halted. On the other hand, the pharmacists had become members of the hospital's Code Blue (cardiopulmonary resuscitation) Team, and their arrival on the scene with the Code Blue Box (which contained emergency drugs) could be delayed, not only by return transit time but an additional factor: uncertain communications. The problem was that the electronic pager the pharmacists carried was not sufficiently sensitive to pick up signals in the library. Although the alert was also reported over the loudspeaker system, the library, like such institutions everywhere, abhorred noisy distractions and, therefore, was not hooked into the system.

In 1967, the library was persuaded to set aside a small office (with telephone) to accommodate the school's growing collection of drug information/poison compendia while providing a strategically located workspace for processing what were now called "drug information consults." This room, obtained at a time when the library itself was trying to cope with its overflowing collections, was a clear indication of broadening campus support for the fledgling clinical pharmacy service. It was also decided that the responsibility for manning the room would be rotated among the clinical pharmacy staff.

Initially, the room and its telephone number were known only to the pharmacists and the health professionals on the surgical ward. On February 1, 1968, however, the Drug Information Center, staffed by Hirschmann and pharmacy resident Gary M. McCart, Pharm.D.,⁴ officially opened its doors to the entire campus. Shortly thereafter, the clinical staff changed its title to the Drug Information Analysis Service (DIAS) to reflect the nature of the service, i.e., the information conveyed was not simply parroted from the literature, but came (wanted or not) with an opinion. It was about this time that the DIAS began to prepare critical written evaluations of the drugs being considered by the pharmacy and therapeutics committee for inclusion into the hospital formulary. Later yet, due to increasing awareness of the complexity of drug information retrieval and analysis, the idea of rotating the pharmacists was abandoned and Hirschmann became the DIAS's first permanent director.

The initiation of the 9th Floor Pilot Project also marked the beginning of a seemingly endless parade of visitors who

⁴Now Clinical Professor, UCSF School of Pharmacy, and Associate Director, Outpatient Pharmacy Service, UCSF Medical Center.

had heard about it and wanted to see it for themselves. Although the pharmacy staff was initially pleased and even flattered by the attention, visitors placed a significant time drain on an already overloaded work schedule. Most aggravating of all were the guests (estimated by the staff to be in the majority during the first five years of the project) who apparently came not to witness but to deny as typified by variations of the following parting shots: "It's impressive, but it will only work here," or "You know that if there is a cutback, the pharmacists will be the first to be laid off." Assumedly, they returned to their superiors to report that the whole notion was an academic fantasy that simply could not fly in the real world. On the other hand were the many visitors who came, obtained what they wanted, and left to establish their own programs.

Almost from the beginning, the pharmacists provided feedback to the school regarding their professional strengths and shortcomings. While they felt that their background was adequate in basic pharmacology, there were a number of important areas in which they discovered that their knowledge was lacking, including:

- How body processes change during or as a result of disease.
- A prescriber's therapeutic aims and objectives in treating specific diseases and how multiple pathologies might influence drug selections.
- How to apply the basic principles learned in extensive courses in pharmacology, biopharmaceutics, and pharmacokinetics to drug selection, dosing, etc., in an actual clinical situation.
- Medical charting procedures.
- Medical terminology and abbreviations.
- The significance of laboratory tests and diagnostic procedures.
- How to communicate effectively with a sick patient.
- How to conduct an adequate information retrieval process and analyze the information obtained.

Smith resigned in June 1967 to go to Long Beach Memorial Hospital where he would soon establish a major clinical pharmacy service. He was succeeded by Miller. Shortly thereafter, Dennis Mackewicz, Pharm.D.,⁹ joined the staff, as later did Eric T. Herfindal, Pharm.D.

In the fall of 1967, everyone held their breaths as a limited number of handpicked fourth-year students were permitted on the floor. Naturally, they were watched like hawks because of a concern that even a minor foul-up by a student could seriously jeopardize the gains made by pharmacists thus far, or result in the permanent banning of pharmacy students. Although there were incidents, they were accepted (with varying degrees of irritation) by the other healthcare personnel who were accustomed to the inexperience-related antics of medical students and residents and who simply added pharmacy students to the list of potential blunderers.

Although the course was called a "special study elective," it was, in fact, a prototype inpatient clinical clerkship, insofar as we can determine, the first of its kind in pharmacy education. Having no precedent, the faculty borrowed liberally from the medical school model, i.e., the students were taught how to take a patient history (drug his-

tory); they also did rounds with the medical staff, attended conferences and grand rounds, and otherwise observed/performed the duties of their preceptors, who by now had established roles on the floor. Educational deficiencies were noted and added to the growing list of items to be addressed during curriculum revision.⁹

In its ten-year plan, drawn up late in 1967, the school committed itself to a revision of the curriculum that would enable the entire terminal year to be devoted to a combination of inpatient and outpatient clerkships. By fall 1968, the previously mentioned "special study elective" was formally deemed a clinical clerkship and was offered as an elective to 12 students a quarter. (At that same time, a decentralized pharmacy unit was also established in the UCSF pediatrics outpatient clinic.) One year later the inpatient clerkship became a required course and several intimidated students rebelled, arguing that it was unfair, illegal, and perhaps immoral to force them to take a course that had not been listed in the catalog when they were admitted. (It is probable that this marked the first student utterance of the disclaimer, "I don't want to be a clinical pharmacist, anyway!") By this time, all unit-dose medications had been sent downstairs to a newly established central unit-dose area, leaving only iv admixtures behind.

In April 1969, the school's curriculum revision committee and the Department of Pharmacy organized a two-day faculty conference for the purpose of orienting the entire faculty to changes that were taking place in health care, the newly explored clinical pharmacy roles, and the educational needs of such a practitioner. A report of that meeting states the following:

An attempt was made to orient each faculty member to how his course related to the pharmacist's practice in the clinical setting. Various course areas were discussed in specific regarding their ability or failure to supply appropriate information.¹

Diplomatic words, these, but what really happened was that the clinical faculty, frustrated by what it perceived to be unacceptably slow progress on the part of the rest of the faculty, collectively prepared a clenched-fist report designed to shake things up. Presented by Hirschmann and Miller, it is recalled today not necessarily for its ultimate impact, but as a turning point in the clinical faculty's recognition of itself as an important and influential component of the faculty. In so many blunt words, the clinical faculty leveled their guns at what they believed to be deadwood courses in the curriculum, while providing direction on some of the course expansions and deletions that were urgently needed. Many of the basic sciences—including organic chemistry, pharmacognosy, and pharmaceutical chemistry—were deeply gored. Also discussed were resources (manpower and money).

Initial reaction was one of shock; when this subsided, irritation set in. These responses were as much related to the style of the report as its content: the still young clinical faculty had not yet learned that in the academic arena, disagreement and forceful persuasion does not necessarily

⁹Today's preceptors may be reassured by the knowledge that some things never change. As noted in an early report: "Students were generally reluctant to commit themselves to give a specific recommendation when challenged to make a recommendation of dosage parameters. For example, they would answer, 'Drug X can be given im or iv in doses of 12 g every 6 to 8 hours.' The student preferred to remain uncommitted even when it was pointed out that that physician wants a *specific* answer appropriate to his needs."¹

⁹Now Senior Assistant Director of Pharmacy Service, Long Beach Memorial Medical Center, Long Beach, CA.

equate to a clubbing. Nevertheless, the report had its desired effect: after that, things seemed to move faster.

Working committees were appointed shortly thereafter and the process of radical revision began in earnest. In August 1970, the new curriculum was presented and approved in principle by the faculty after a remarkably brief period of discussion. It was radical, indeed. Many courses, especially those with laboratories, vanished or were condensed; new courses, primarily clinical and biological, were introduced and the fourth (terminal) year was devoted entirely to clerkships. During this same month, the service was expanded to cover the 60-bed general medicine ward.

Just about everyone agreed that the time had come for a little showcasing. That September, the school and the DHEW National Center for Health Services Research and Development cohosted a national invitational symposium entitled "Challenge to Pharmacy in the 70s." A wide variety of influential people attended, including federal bureaucrats, elected officials, association executives, physicians, nurses, pharmacists, and pharmacy deans/faculty, who listened attentively as their colleagues expounded on the opportunities that lie ahead for the clinically skilled pharmacist. Several of the speakers were administrators, nurses, physicians, and pharmacists from UCSF who described their experiences with the clinical pharmacy service and (to no one's surprise) smothered it with praise. The school had realized that words could only go so far in conveying images of what a clinical pharmacy service looked like in practice and had prepared a two-hour videotape to bridge the gap between imagination and reality. Thus, the viewer was carried onto the wards, on rounds, and into patient's rooms, the drug stations, the DIAS, and several outpatient clinics. Better yet, pharmacists and students were shown doing what they did best: aggressively affecting drug therapy, state of the art, circa '70. (After the conference, the videotape was on constant loan to other schools and institutions; several years later, upon request, a copy was donated to the American Institute of the History of Pharmacy.)

In 1973, following a one-year transitional period in which Robert L. Day, Pharm.D., served as a vice chair for clinical pharmacy in the school's Department of Pharmacy, Herfindal assumed responsibility for what would shortly become known as the school's division of Clinical Pharmacy. Over the next several years, he focused on expanding clerkship sites, faculty development, publications, and research.

Having accomplished the goal of developing the role of the clinical pharmacist in an inpatient setting and having set in place the educational experiences necessary for such practitioners, the division now turned its attention to research, a necessary step for it to receive the recognition of the academic community. Despite a heavy service and teaching load, clinical faculty were encouraged to gradually become involved in collaborative research with physicians in their practice area. Many did and ultimately became principal investigators in projects involving pharmacokinetics, pharmacodynamics, and health-service research, among other areas. The residency program was expanded and included specialized programs in hospital pharmacy administration, pharmacokinetics, drug information, and pediatrics. Research fellowships soon appeared on the scene.

Although the role of the pharmacists in patient care at UCSF was now fully accepted by the medical staff and administrators, it was clear that the lack of quantitative justification would remain a stumbling block in expanding the program and in providing the pharmacy community with a model that could be implemented in other settings. In 1978, an extensive research project was implemented to study the impact of the clinical pharmacist on physician prescribing behavior. Two publications^{4,5} and an American Society of Hospital Pharmacists Research Award (1984) resulted.

Over the years, visitors have continued to pass through, domestic and foreign scholars have stayed for periods of six months to a year for clinical pharmacy training, the curriculum has been refined (it has never quite settled down), the clinical pharmacy staff first doubled then quadrupled in size, and clinical pharmacy services have been expanded to cover all hospital wards and clinics and, eventually, other hospitals throughout the state. In addition, the teaching program has been extended to University of California medical center hospitals in San Diego, the Los Angeles/Orange County Area, and the Sacramento Valley. And the volunteer clinical teaching staff has grown from 4 people in 1964 to more than 400 in 1990.

It would be impossible to quantify the impact this program has had on the development of clinical pharmacy elsewhere. The best that can be said is that it had some considerable effect in the beginning, but even that is supported only by anecdote. Take, for example, the guests that visited. Like John A. Biles,⁶ William Kinnard,⁴ Allen I. White,⁷ Dick R. Gourley,⁸ and Edward B. Roche,⁴ they returned to their schools or institutions to pioneer in part or whole a curriculum and/or services that were patterned along the lines of the program at UCSF. Others, from foreign lands, did similarly. Still others plucked off graduating seniors in large numbers for faculty appointments for the simple reason that UCSF was the nation's primary source of clinically trained practitioners well into the 1970s. Even today, a quick browse through the clinical faculty rosters of the nation's pharmacy schools will reveal a significant number of UCSF graduates.

Did the accomplishments of our faculty that were "firsts" of their kind have some impact on education and practice? If so, we would have to acknowledge the first regular drug information column in an international pharmacy journal (Hirschmann, "DIAS Rounds," *DICP*, 1970), the first regular drug therapy column in a national pharmacy journal (Hirschmann and Herfindal, "Current Therapeutic Concepts," *Journal of the American Pharmaceutical Association*, 1971), the first two clinical pharmacy (drug therapy) textbooks (Herfindal and Hirschmann, *Clinical Pharmacy and Therapeutics*, 1975, and Brian Katcher, Mary Anne Kimble, Theodore G. Tong, and Lloyd Y. Young, *Applied Therapeutics*, 1975), and the first clinical pharmacokinetic text for pharmacists (Michael E. Winter, *Basic Clinical Pharmacokinetics*, 1980).

⁵Dean, School of Pharmacy, University of Southern California, Los Angeles, CA.

⁶Then Dean, School of Pharmacy, University of Maryland, Baltimore, MD.

⁷Dean Emeritus, College of Pharmacy, Washington State University, Pullman, WA.

⁸Now Dean, School of Pharmacy, University of Tennessee, Memphis, TN.

⁹Now Associate Dean and Associate Professor, College of Pharmacy, University of Nebraska, Omaha, NE.

In the long run, however, it matters little who the many parents of clinical pharmacy were (and there were many), for like the gifted child it was, it has far exceeded the modest expectations of those who participated in its conception, birth, or adolescence. Even as a young adult, now slightly over 25, it is still testing its wings and it becomes more independent by the day. To have shared in the experience of having helped it take its first few, toddling steps was a privilege. To see it as it is now is a dream come true.

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