MIRROR TO HOSPITAL PHARMACY

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American Society of Hospital Pharmacists

Mirror to Hospital Pharmacy

MIRROR TO HOSPITAL PHARMACY

A REPORT OF THE AUDIT OF PHARMACEUTICAL SERVICE IN HOSPITALS, A STUDY PROJECT CONDUCTED UNDER GRANT W-45 FROM THE U. S. PUBLIC HEALTH SERVICE

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Preface

MIRROR TO HOSPITAL PHARMACY is a comprehensive study of hospital pharmacy in the United States. It is not, however, as comprehensive as was originally envisioned and we have not achieved all the specific objectives as set forth in Chapter IV. We have, nevertheless, succeeded in studying in considerable detail the professional and administrative services offered by hospital pharmacists. We have gathered data relative to facilities and personnel and the place of the pharmacist in the hospital organization and his view of the attitude of others toward him. We have also inquired into his education and training. We have examined carefully the pharmacy and therapeutics committee. We have obtained also a great deal of information as to the manner in which drugs are handled in the many hospitals lacking the services of a pharmacist.

In presenting this material for your consideration we have decided to present a summary of the study as the first chapter. This chapter, which makes up Part I, contains all of the recommendations taken from the various chapters and a discussion of their implications. This, we hope, will serve to whet your interest and that you will then read the remaining chapters with more curiosity. As a matter of fact, some of the recommendations will not be understood clearly until the material in the chapter from which they were taken is studied. In addition, individual chapters contain more detailed discussion of the findings and should be studied to obtain a complete picture.

Part II is a discussion of goals for hospital pharmacy, which are related to goals for pharmacy as a whole. Part of this Chapter II was published originally by Clifton Latiolais under the title "Professional Survival —Its Dependence on Hospital Pharmacy" and appeared in the *American Journal of Hospital Pharmacy* for May 1961, page 272. Part III, Chapters III and IV, relate to the origins, objectives, and methodology of the survey and may be scanned rapidly. Beginning with Part IV, Chapter V, we take up the survey proper and continue for the remainder of the book to hold a mirror to hospital pharmacy.

We wish to acknowledge the devoted assistance of the members of our advisory committees and the consultants who are listed on page xi. Their many comments and helpful suggestions are greatly appreciated. They have been very patient during the long course of this project and have contributed much to the value of this study.

In addition, there are many others whose help we wish to acknowledge: to Angus Campbell and his staff at the Survey Research Center at the University of Michigan—Charles Cannell who spent many hours advising us and who coordinated all other contacts at the Survey Research Center; to Leslie Kish who prepared the samples for the study project, and to Charlotte Winters who coded and followed through the punching of information on the electronic data processing equipment; to David Burkholder who, while a graduate student at the University of Michigan, worked so diligently and with so much initiative in working out the estimation of manpower needs; to Ruth Vermetten, a full-time secretary during the early phases of the study, whose speed and accuracy and the ease with which she set up complicated tables were a delight to behold;

to Marjorie Zugich who, during the early phases of the project, reviewed and abstracted the literature; to Iris Templin, secretary of the Pharmacy Department at the University of Michigan Hospital, whose typing of several chapters did much to keep the study project moving; to Nancy Kendrick, secretary on the staff of the American Society of Hospital Pharmacists, whose typing during the final stage of the project was most helpful; and to Joanne Branson, research assistant on the staff of the American Society of Hospital Pharmacists, upon whom we have depended greatly for the shape of the final copy; and to Richard A. Huff, art editor of the *American Journal of Hospital Pharmacy*, for his design of the book. We wish also to acknowledge the support of the United States Public Health Service under whose grant W-45 this study project was conducted.

To A. C. Kerlikowske, Director of the University of Michigan Medical Center, I owe a special word of appreciation for his encouragement to undertake this study, the great amount of freedom he gave me to pursue it, and for his kindness, his friendship, and his great understanding during my twenty-eight years of association with him.

August 28, 1963 DON E. FRANCKE

Foreword

PUBLICATION OF MIRROR TO HOSPITAL PHARMACY signifies an end, as well as a beginning. It brings to fruition a dream long held in the minds of leaders of the American Society of Hospital Pharmacists. The need for a comprehensive survey to determine the status of pharmacy practice in hospitals was suggested early in 1943 when H. A. K. Whitney, as chairman at the Society's First Annual Meeting, stated:[1]

> . . . Hospital Pharmacy stands at the beginning of a new era . . .
>
> If we can now only roughly sketch the general course to be followed; if we will actively cooperate with the leaders and help all along the way; if we will have faith in ourselves, in each other, in the profession; then, and only then, shall we have made a beginning. . . .

A few years later, in *The General Report of the Pharmaceutical Survey*, 1950, hospital pharmacists and the profession as a whole were reminded:[2]

> The pharmacist engaged in hospital practice holds a most, if not the most, strategic and important position in the entire field of professional practice. By virtue of the environment in which he practices, demands are made upon his professional and personal abilities, which indeed represent a challenge. . . .

With increased utilization of hospitals, as well as advances in pharmaceutical preparations, the need for introspection into the practice of pharmacy in hospitals became increasingly significant.

Mirror to Hospital Pharmacy is a reflection of the present. This reflection is bright, not shadowy. It represents stimulating challenge, not dismal despair. It is factual, not speculative. Today's reflection should be helpful in designing tomorrow's image, hopefully brilliant and truly representative of the professional function and practice of pharmacy in hospitals.

This survey was made at a time of tremendous growth and development in the practice of pharmacy in hospitals. The full value of a survey of this kind often becomes more apparent as the years go by.

The survey is voluminous—the more than 200 tables and figures require microscopic examination—the implications are far-reaching—the recommendations may sometimes be difficult to carry out and require time—and often, perhaps too often, the truths are more revealing than we would like them to be. Yet, it is only in knowing these truths that we will be able to proceed toward orderly improvements. For the first time, we can work from the truth.

Members of the Society who have given support to this project now inherit a responsibility to see that the unfinished task that lies ahead will be completed. In discharging this responsibility, every pharmacist practicing in a hospital in the United States must, in 1964 and in the ensuing years, look at the study from the standpoint of his own service and commitment to his profession and to his specialty. Then, he will establish

1. Whitney, H. A. K.: Address of the Chairman, *J. Am. Pharm. Assoc., Sci. Ed. 32*:457, 1943. (Thru *Am. J. Hosp. Pharm. 15*:508 (June) 1958.)

2. *The General Report of the Pharmaceutical Survey 1946–49*, American Council on Education, Washington, D. C., 1950, p. 155.

goals for his own pharmacy and for his own practice that will contribute ultimately to total improvement of pharmacy practice in hospitals. This remaining task cries out for commitment and involvement on the part of every devoted pharmacy practitioner in hospitals. The dynamic nature of the situation will not countenance nor tolerate the presence of hospital pharmacists who would prefer to remain innocent bystanders. United, and once committed to the task, there is little we cannot do in a host of cooperative ventures. Thus, hospital pharmacists are in a unique position to make significant contributions.

If this report seems long and at times complex, it is because the subject is complex. The premise on which this report is based is that, given the facts, hospital pharmacists, through their local societies and those who represent them on the governing boards of national societies, will be in a better position to make the right decisions.

To be able to do a study of this type is an opportunity. As members of the Society well know, the Audit of Pharmaceutical Service in Hospitals was carried out under a grant from the United States Public Health Service. Hospital pharmacists and administrators responded by replying to time-consuming questionnaires. Allied organizations—the American Hospital Association, the American Pharmaceutical Association, and the Catholic Hospital Association—all gave their support. Publication is the sole responsibility of the American Society of Hospital Pharmacists.

Although appearance of the report was delayed, this was more a matter of design than accident. Too often, surveys begin and suddenly end and labors of dedicated individuals come to naught for lack of follow-up. The vision remains a vision and soon fades and is lost forever.

Hopefully, such will not be the case with respect to the Audit of Pharmaceutical Service in Hospitals. With the findings in hand and the painstaking task of their interpretation completed, the recommendations that have been developed will be studied by the Society's Commission on Goals and various committees so that orderly implementation will result.

Over a period of years numerous individuals have been involved in actual work and consultation in bringing the findings reported in *Mirror to Hospital Pharmacy* into a form for publication and implementation of the recommendations.

It is not at all easy to give adequate recognition to all those who have served so well in the Audit of Pharmaceutical Service in Hospitals. Those who have been involved have put aside personal consideration, sacrificed time and planned the study on a high-level basis. The toils and effort that are reflected in the reading of this report represent a labor of love and dedication to the profession of pharmacy on the part of the authors, Don E. Francke, Clifton J. Latiolais, Gloria N. Francke, and Norman F. H. Ho.

To Dr. Francke, Program Director of the Audit, the Society is indebted for devotion to his task, seldom equaled and rarely surpassed. His planning was comprehensive.

The Society is even more fortunate that Dr. Francke, who has devoted himself to the study during the last several years, has accepted a per-

manent staff appointment as Director, Department of Scientific Services, and is now in a position to implement and to carry to fruition the recommendations outlined in the report.

The American Society of Hospital Pharmacists is grateful to all who have supported the study, and especially to the United States Public Health Service. The Society's Board of Directors are to be commended also for their foresight in making *Mirror to Hospital Pharmacy* available on a complimentary basis to Society members and at an established price to allied organizations, hospital administrators, students, educators, members of pharmaceutical industry, and others who wish to take advantage of the study.

If the preparation and distribution of this report will contribute in a small way to a better understanding of the problems confronting these practitioners of pharmacy in hospitals, and if it helps toward a solution of these problems, the effort will have been a worthwhile public service.

October 31, 1963

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PART I

I

Conclusions, recommendations, and implications

1

INTRODUCTION

During the course of this survey we have gathered many facts concerning the practice of American hospital pharmacy. These include information on the physical facilities devoted to the pharmacy, much demographic data on hospital pharmacists including their education and training and the numbers engaged in this specialty, and considerable data on the professional and administrative services furnished by hospital pharmacists. After tabulating and studying the data we have discussed and interpreted the findings and made appropriate recommendations within each of the chapters. Although the Advisory Committees and consultants have reviewed this report, responsibility for the interpretation of the findings and for the recommendations made must rest with the authors of this study—as must the responsibility for individual bias which inevitably creeps in despite attempts to avoid it.

The role of the administrator in providing good pharmacy service has only been covered by implication in this report since the questionnaires were directed to the chief pharmacists. Certainly, if hospital pharmacy is to grow and expand and evolve into a more useful profession in the health field, it will be due in large measure to the help and understanding of hospital administrators. This help and understanding must, of course, be eventually converted to the hard realities of money, space, and authority. To have the pharmacist's foot on the accelerator and the administrator's foot on the brake guarantees that the motor will stall. We hope the findings of this study will lead hospital administrators and hospital pharmacists together down a very important and fascinating road ahead.

Throughout this study we have pointed out implications of the various findings and have made recommendations. We believe it will be helpful now to bring all the recommendations together and to discuss their broader professional implications. For this purpose we have classified the recommendations under five headings. Needless to say, some overlapping is inevitable within these groupings, and the arrangement to some may appear arbitrary. Nevertheless, we believe this arrangement serves the useful purpose of organizing the material for discussion.

First are those recommendations which deal with what we term the direct professional services of the pharmacist. These include such services as compounding and dispensing, manufacturing and control, procurement and storage, and others which are concerned more with deeds than they are with words.

The second grouping involves professional functions concerned more with words than with deeds. These include the role of the pharmacist as a consultant, as a teacher and preceptor, and his advisory functions to the medical staff through the pharmacy and therapeutics committee. It also includes his advisory function to other groups engaged in investigation or research, but not these functions when the pharmacist himself performs them.

The third group of recommendations relate to facilities. These include space and equipment, manpower facilities, and the closely related topic of salaries.

Recommendations concerning the management or administrative functions of the hospital pharmacist comprise the fourth group. These include the place of the pharmacist within the hospital's organizational structure, his administrative responsibilities in the management of the pharmacy—including business records, control of expenditure and inventory, and staff assignments, schedules, and workloads.

The fifth group of recommendations are those related to the role of national professional societies such as the American Society of Hospital Pharmacists, the American Pharmaceutical Association, the American Association of Colleges of Pharmacy, and others. Essentially these recommendations relate to problems which cannot be dealt with by individual hospital pharmacists, but rather, because of their complexity or scope or cost or for some other reason, must be

handled by a national society. The education and training of hospital pharmacists, institutes and other refresher programs, and demonstration projects are examples.

2

RECOMMENDATIONS PERTAINING TO DIRECT PROFESSIONAL FUNCTIONS

2.1 The Recommendations

1 Scope of Service. It is recommended that an evaluation be made of the relationship between scope and quality of pharmacy service; the availability of measured amounts of space, equipment, and personnel; and the extent and skill with which the chief pharmacist utilizes management tools in operating his department. (7.1)*

2 Quality of Drugs. It is recommended that hospital pharmacists insist on recognition of their moral, legal, and professional responsibilities to procure, store, and dispense quality drugs for the sick and that a statement embodying these principles and the exercise thereof be issued by the American Society of Hospital Pharmacists. (6.6)

3 Specifications and Sources of Supply. It is recommended that a solution be sought to the problem which exists in some hospitals due to the lack of the pharmacist's authority to designate specifications and sources of supply for medications and that the legal and ethical principles of professional responsibility in this matter be brought forceably to the attention of those concerned. (6.7)

4 Improvement of Dispensing Procedures. It is recommended that a demonstration project be undertaken designed to improve dispensing procedures in hospitals and to study such matters as increasing efficiency in getting medication to the patient, conservation of the time of nurses, physicians, and pharmacists, elimination of dispensing errors, control of drugs distributed, proper labeling, applications and limitations of automation, and factors influencing the safe and efficient dispensing of medication including such factors as charges for drugs, prepackaging, unit dose dispensing, preparation of complex parenteral admixtures and dilution of injectable drugs of limited stability. (7.3)

5 After-Hour Pharmacy Service. It is recommended that the profession study the problem of after-hour pharmacy service in hospitals and clearly delineate the responsibilities of the pharmacist and the role of nurses in providing medication to patients when the pharmacy is closed. (7.4)

6 Commission on Outpatient Dispensing. It is recommended that a commission broadly representative of the profession study the effects the dispensing of prescriptions to indigent and non-indigent outpatients has upon pharmacy as a profession including (1) the role of the hospital pharmacy as an integral unit of essential patient service, (2) the need of the public to have its medications dispensed by pharmacists, (3) opportunities for professional practice in community and hospital pharmacy, (4) the effect the number of community pharmacies and hospital pharmacies has on opportunities for professional practice, (5) the effects upon the profession of the establishment of pharmacies in physicians' office buildings located near the hospital and how these effects differ according to the status of the pharmacist-manager, *i.e.*, hospital employee, corporation employee, or owner, and (6) legal statutes, opinions, and other implications of the law as it affects outpatient dispensing. (7.5)

7 Inspection of Drugs on Nursing Units. It is recommended that representatives of pharmacy and nursing reevaluate the benefits and importance of periodic inspection of drugs in nursing and clinic units and suggest general policies and procedures for carrying out this activity. (7.6)

8 Inspection of Pharmacy. It is recommended that directors of pharmacy service periodically conduct a formalized inspection of the pharmacy department (including drugs) to audit professional and administrative performance and needs. It is further recommended that those findings and suggestions for improvement which require administrative approval be brought to the attention of the hospital administrator in writing. (7.7)

9 Manufacturing by Hospital Pharmacists. It is recommended that a study commission be established to evaluate the advantages and disadvantages of increasing the scope of manufacturing or bulk compounding in hospital pharmacies, taking into consideration at least the following factors: (1) opportunities for pharmacists to utilize their professional knowledge and skills in providing better patient service, (2) creating higher motivations for pharmacists to enter hospital practice, (3) facilities required for manufacturing based upon types of products prepared, (4) related control procedures which should accompany manufacturing programs, (5) possible role of other hospital departments in the establishment of a control program, (6) advisability of the national professional organization establishing a central laboratory for the development and testing of formulations for manufactured products, (7) compilation and publication of recommended tested formulas, (8) special opportunities which exist in hospitals for the pharmacist to assume a greater role in the preparation of sterile products, and (9) relationship between increased or decreased manufacturing and educational and training needs of hospital pharmacists. (7.8)

10 Responsibility for Sterile Preparations. It is recommended that hospitals be encouraged to assign to pharmacists the responsibility and to provide the necessary facilities for the preparation and quality control of sterile medicinal products produced in hospitals, even when these products are produced in another department. (7.11)

11 Central Sterile Supply Service. It is recommended that an educational and training program be developed to more fully qualify hospital pharmacists to assume the responsibility for central sterile supply service. (7.10)

* The number in parenthesis after the recommendation refers to the chapter from which the recommendation comes, and its number. For example (7.1) signifies recommendation number one from Chapter VII.

12 Demonstration Projects in Manufacturing. It is recommended that pharmacies in hospitals of various types and sizes be encouraged to establish demonstration projects in the manufacturing or bulk compounding of pharmaceuticals, together with proper control methods, and that these projects be used as training centers for hospital pharmacists interested in expanding the scope of their service and improving its quality. (7.9)

13 Improvement of Control Procedures and Assay Methods. It is recommended that a study commission be established to examine and recommend ways and means of bringing assay methods and control procedures in hospital pharmacies to higher standards, and that this project be given high priority. (7.13)

14 Control Manual. It is recommended that the study commission investigate the need for a manual on recommended control procedures and records for products manufactured and/or prepackaged in hospital pharmacies and that this project be given high priority. (7.14)

15 Demonstration Projects on Control. It is recommended that pharmacies in hospitals of various types and sizes be encouraged to establish demonstration projects in which good control procedures are related directly to products manufactured and dispensed and to a selected number of products purchased. (7.15)

16 Investigation and Research. It is recommended that hospital pharmacists, particularly those in teaching hospitals, make professional and administrative investigation and scientific research formal objectives of their departments and take the steps necessary to carry out these objectives. (7.20)

17 Full-Time Research Positions. It is recommended that pharmacists associated with research hospitals develop research programs and find means of employing a full-time research pharmacist to carry them out. (7.21)

18 Collaborative Investigation and Research. It is recommended that hospital pharmacists become more active in collaborative research projects with the medical and allied professional staffs and with administrative personnel of the hospital. (7.22)

2.2 Scope of Direct Professional Services

These recommendations deal with those acts yielding direct professional services which may be grouped as follows:

1. Developing specifications for purchase of all drugs, chemicals, biologicals, and pharmaceutical preparations used in the diagnosis and treatment of patients.

2. Dispensing of medications, chemicals, surgical supplies, and related health items.

3. Compounding prescriptions for individual patients.

4. Inspection of medication, chemicals, reagents, and related supplies throughout the hospital.

5. Manufacturing and prepackaging of bulk quantities of sterile and non-sterile medicinal products.

6. Assaying and by other means controlling the quality of drugs manufactured and purchased.

7. Conducting investigations or research.

8. Services to hospitals without pharmacists.

One of the basic questions affecting the professional future of hospital pharmacy is the scope of direct professional services performed by its practitioners. As found in this survey (Chapter VII), a high percentage of hospital pharmacists tend to limit their services to dispensing, compounding, and preparing specifications for drugs and allied items. For any real significant advancement in professional stature of hospital pharmacy, however, a far higher proportion of its practitioners must extend their professional acts to include those beyond compounding and dispensing.

In some hospitals there may be good and valid reasons why the pharmacist cannot go very far beyond these services. The finding that a large percentage of pharmacists do not want to extend their scope of service is more significant. This indicates that hospital pharmacy has not yet achieved a standard or pattern of professional practice which is widely accepted and followed. One may assume that every chief pharmacist wants to provide the many varied services in order to develop pharmacy and himself to the fullest degree. This assumption represents the ideal toward which hospital pharmacists as a group should strive. Any number of reasons (see factors limiting scope of service) may prevent hospital pharmacists from rapidly moving toward this ideal. But this does not mean that the statement of and devotion to the ideal are without value. The future development of American hospital pharmacy depends upon the clarity and enthusiasm with which its ideals of pharmaceutical service are stated and the degree to which they find common acceptance.

All indications are that hospital pharmacy is now undergoing basic changes brought on by the entrance of increased numbers of hospital pharmacists with specialized education and training, by the rise in the level of basic pharmaceutical education offered by the colleges of pharmacy, and as a result of the work of the American Society of Hospital Pharmacists along many fronts.

There is, of course, a basic relationship between scope of service and facilities. Given the functions to be performed by the pharmacy department and a quantitative estimate of their volume in approximate units, one can predict quite accurately the space, equipment, and personnel required to carry out these functions. A study of these interrelationships is recommended.

2.3 Authority for Specifications and Sources of Supply

A high percentage of hospital pharmacists now have authority to list acceptable sources of supply for drugs purchased for use in their hospital. A few do not, and apparently experience great difficulty when drugs purchased on price alone are delivered to the pharmacy.

It is vitally important that hospital pharmacists as a professional group place major emphasis and continuous stress on their moral, legal, and professional responsibility to procure and dispense quality drugs for the sick. Involved are such questions as factors beyond the assayed strength of the product which affect the quality of medication, the reliance which may be safely placed upon labeled strength, and, perhaps most important, the individual, personal, professional responsibility which must be accepted if the pharmacist is to fulfill his professional health role, and how these obligations are best met.

2.4 Dispensing of Medication to Inpatients

Dispensing of medication is one of the basic functions of the pharmacist, one which is the culmination of many other preparatory activities such as procurement and manufacturing, and one which occupies a high proportion of the pharmacist's time. This survey shows the high volume of drugs dispensed in hospitals. Many factors point toward a continuous rise in the use of drugs in hospitals.

Dispensing is probably the least neglected function of the pharmacist because it is the essential step in getting the medication to the patient. When the workload of a pharmacy increases without a comparable increase in personnel, other functions may be neglected but the distributive function is so essential that it must be continued at all costs.

One of the basic problems of hospital pharmacy is to so streamline and improve the efficiency of dispensing that the pharmacist has sufficient time to devote to the other areas of his responsibility. This assumes that it is not practical to keep adding pharmacists in direct proportion to the increase in the volume of drugs dispensed. Rather, it would seem preferable to make hospital pharmacy more attractive by payment of higher salaries to pharmacists, expecting them to increase the efficiency of their operation through the intelligent use of mechanization and employment of well-trained nonprofessional personnel in such tasks as prepackaging, routine labeling, counting, typing, charging, and keeping of records. At the same time, renewed efforts should be made to insist that the pharmacist interprets the physician's original prescription or order for the patient.

Traditional methods of dispensing drugs to inpatients should be completely reevaluated. Many dispensing procedures involving prescriptions for patients, for example, are based to a great extent on easy methods of charging patients for drugs. But this method is time-consuming, not only on the part of pharmacists but also for nurses who must sort out individual bottles in order to administer the medication. Hospital pharmacy must investigate other methods of dispensing including the use of automated devices, single-dose dispensing, the dispensing of essentially all frequently used drugs as stock on nursing units, and the more extensive use of nonprofessional personnel under careful supervision. Involving as they do in many cases rather drastic changes from traditional patterns, the new procedures may be carefully evaluated from many viewpoints including patient safety, professional responsibility, interprofessional relationships, and their legal and ethical aspects. Of course, it is possible that results of these studies might call for an increase in the number of pharmacists, in apparent contradiction to increasing the efficiency of dispensing. If this happens, however, it must be based on total personnel savings such as would result, for example, if nurses were to be relieved by the pharmacy of the preparation of individual doses of medication.

New methods of dispensing should relieve the pharmacist of much routine activity and open the way toward greater professional contributions. There is little question that a large percentage of hospital pharmacists have very heavy workloads, of which the dispensing function requires a large block of their time. Demands are so pressing in this area that little time is left to devote to the many other activities of the department. Numerous opportunities exist for the hospital pharmacist to strengthen and expand the other professional and scientific aspects of the practice of hospital pharmacy, to increase his teaching role in the hospital, and to carry out various types of investigation and research.

We are led to the conclusion that the dispensing function of the pharmacist, while important and even vital for patient care, is essentially a superficial practice of the profession which, by itself, does not utilize knowledge or skills sufficiently basic to merit professional recognition *to the depth that lies within the grasp of hospital pharmacists.* At the same time we recognize that much knowledge must underlie the dispensing of drugs and all that this implies. The main emphasis in this admittedly controversial statement is on the routine, manual, time-consuming procedures of dispensing which keep the pharmacist from other professional activities which cry out for attention in every hospital. Undoubtedly changing patterns in dispensing will lead to new patterns in the professional practice of hospital pharmacy.

2.5 Dispensing of Medication to Outpatients

A related question which has broad implications for the total profession of pharmacy is the dispensing of prescriptions to outpatients. This will be discussed in Chapter VII. The filling of outpatient prescriptions by hospital pharmacists is a practice strongly opposed by community pharmacists and their organizations. They object particularly to (1) the filling of prescriptions for private pay patients and (2) especially those private pay patients who are not patients of a physician affiliated with the hospital. This survey did not elicit information as to the number of hospitals which do supply prescription service for the general public, that is to patients not associated with the hospital or a member of its medical staff. But the number of hospitals supplying this

type of service is thought to be quite small. Most of the prescriptions furnished by hospitals to private pay patients are undoubtedly furnished to patients of a physician who is a member of the hospital staff.

In general, hospital pharmacists do not want to furnish outpatient prescription service to the general public and feel that this service should be left to the community pharmacists. Even in this case, however, long traditions and local circumstances, such as supplying 24-hour pharmacy service and other services to the community, have modified the thinking of some hospital pharmacists.

Most hospital pharmacists believe they have every moral, legal, and ethical right to offer outpatient prescription service to patients of any physician connected with the hospital. They feel strongest in their position when the patient is a registered patient of the hospital and is seen in a hospital building and less strong when the patient is not a registered patient of the hospital and is seen by the physician away from the hospital. They believe, however, that only a few patients in the latter category will make the trip to the hospital to have their prescriptions filled and if they do, they have been sent there by their physicians for a definite reason and must be served.

But perhaps most important is the trend for physicians to establish private offices in hospitals and hospital-associated clinic buildings where they see both private and indigent patients. Such a location offers many advantages to physicians, including the immediate availability of all diagnostic and therapeutic tools, proximity to their hospitalized patients, and other benefits. When these physicians have contractual arrangement with the hospital, the conditions of the contract are usually that the hospital will make all of its diagnostic and therapeutic facilities available to them so that they may give adequate medical care to their patients. Pharmaceutical service is among these facilities. Thus, such an arrangement goes beyond the differences of opinion within pharmacy as to whether prescription service will or will not be provided.

Because of the growing importance and recognition of the hospital as a center for community health, it is reasonable to predict a rise in the number of hospitals offering outpatient prescription service and a consequent rise in the number of outpatient prescriptions filled in hospitals. It does not seem realistic to believe that patients who are seen in the outpatient divisions of hospitals will not be able to obtain their medication at the same time and place. Nor does it seem realistic to believe that the rights of hospitals to supply medication to outpatients can be limited to serving only the indigent. Still, the growth of this practice is bound to worsen relationships between hospital and community pharmacists, to alter basically the pattern of pharmaceutical practice in the United States, and to have ramifications in educational practices, recruitment programs, patterns of drug distribution, etc.

Undoubtedly social needs and pressures will be basic factors in directing the course of action. As the complexities of medical care increase and more physicians tend to specialize, so too will the hospital become more firmly established as the medical center of the community with offices for physicians and with all facilities needed for the treatment of patients. No one can predict how or when broad medical benefits will be provided for large segments or all the nation's non-indigent citizens or when the role of preventive medicine will increase sharply. But it is highly probable that access to medical care will be made much easier in the relatively near future. Once public opinion becomes crystallized on these matters, terrific pressure for programs can develop rapidly. All this means, of course, that the utilization of hospital facilities will continue to rise and that these facilities will continue to expand. Included will be new facilities for ambulatory patients including convenient housing for patients undergoing diagnosis or treatment, facilities for care of geriatric patients, provision for home care, more emphasis on the preventive aspects of medicine and rehabilitation of the injured, and entirely new methods for treatment of disease. The question of outpatient prescription service within this setting is one which is important to the total profession.

Hospital pharmacists will undoubtedly continue to offer outpatient prescription service in much the same manner as they do now. But the volume of drugs dispensed will be much greater due to greater utilization of hospital facilities by the public. This means the employment of additional hospital pharmacists, a matter which directly concerns the educational programs offered by colleges of pharmacy. It also means that the future will bring an increase in the percentage of employed pharmacists, in contrast to the number of pharmacy owners. Also, many college graduates, who in former years would be employed by a community pharmacy, will be employed by a hospital.

It is difficult to assess without further study the effect increased utilization of outpatient facilities will have on the community pharmacist. Undoubtedly many of the prescriptions written in outpatient units will continue to be filled by community pharmacists. Also, with more and more people seeking medical care, a much larger volume of drugs will be prescribed and, proportionally, the community pharmacists will receive many of these prescriptions.

One of the basic questions to be answered is whether pharmacy as a profession will be bettered or worsened if a higher proportion of drugs is distributed to non-hospitalized patients by pharmacists practicing in hospitals. It will be difficult to obtain an objective answer to this question. This question is so important that it should be studied by a commission broadly representative of the profession.

2.6 Inspection of Drugs Throughout the Hospital

This survey has shown that hospital pharmacists have a rather lukewarm attitude toward their responsibility of inspecting drugs throughout the hospital. This is

an important direct professional service which promotes patient care through the removal and replacement of deteriorated, outdated, improperly stored, mislabeled, or otherwise unfit drugs. Hospital pharmacists should meet with representatives of nursing to reevaluate the benefits and importance of drug inspection. The objective should be the development of policies and procedures so that this responsibility would become a routine part of the pharmacist's job. All hospital pharmacists could immediately take steps to fulfill this professional responsibility.

2.7 Inspection of Pharmacy

Hospital pharmacists should periodically look over their departments and make a rather thorough audit of professional and administrative performance and needs. This examination should go far beyond the inspection of drugs. It would be the type of comprehensive inspection for which the Point-Rating Plan for Hospital Pharmacy, developed by the Catholic Hospital Association, would be a suitable score sheet. These inspections would serve not only as a basis for memoranda to the administrator calling his attention to departmental needs but also as a checklist of professional and administrative improvements to guide the chief pharmacist.

2.8 Manufacturing or Bulk Compounding

More difficult is the question of the extent to which hospital pharmacists could and should engage in pharmaceutical manufacturing, control, and research. Factors which mitigate against such involvement are those of a highly industrialized society in which mass production techniques make it uneconomical to produce and control small batches of medication. Another limiting factor is that a very high percentage of the drugs used today are either under patent control or are, by their nature, too complex to be produced other than in a highly organized and controlled industry as, for example, the antibiotics.

First, it may be well to define what we mean by manufacturing. By manufacturing we mean bulk compounding, that is, preparing more medication at one time than will be dispensed to one patient on a single prescription. For example, the preparation of 120 ml. of a cough syrup prescribed for a single patient is compounding, while the preparation of, say, 4000 ml. of this same cough syrup for general use is manufacturing. In the same way even the simple dilution of a concentrated medication or the preparation of a simple solution intended for dispensing to more than one patient must be included in the definition of manufacturing. These procedures are not, in fact, alien even to the pharmaceutical industry. The difference is that in the pharmaceutical industry these simple procedures are the exception, while the more complex procedures are the rule; in hospital pharmacy the reverse is true. Thus, we see by this definition that manufacturing may vary from the simplest procedures which may be carried out by a pharmacist with a minimum of equipment to much more complex operations demanding more intricate and specialized equipment and facilities and far greater understanding and application of scientific, technical knowledge. Using this broad definition, it is probable that many more hospital pharmacists than reported doing so, actually do some manufacturing, perhaps only of the more simple products.

Accepting this definition, there are many products which may be manufactured economically in hospital pharmacies. But is economy the only factor or indeed the principal one? We believe it is not. There are at least four others: patient service, patterns of professional practice, teaching, and research.

Results of this study show that physicians in many hospitals request medication in forms not commercially available. They do this presumably because they believe that a special preparation is desirable for their patient. Thus, existence of a manufacturing program in a hospital pharmacy contributes directly to patient care. It also encourages physicians to seek to fill the special needs of their patients rather than to restrict their prescribing to prefabricated products or to a large number of extemporaneously compounded items. In addition, the existence of a manufacturing program guides the pattern of professional practice along a course leading to deeper involvement in the practice of pharmacy, to a more significant contribution to the training of future hospital pharmacists, and toward involvement in research.

The pharmacist who engages in manufacturing uses areas of scientific knowledge quite different from those used for dispensing and compounding. In fact, isn't it true that manufacturing and control are the only areas of professional practice which give the pharmacist an opportunity to use, to any significant extent, the large body of knowledge based on the physical sciences as applied particularly to pharmacy? If this is true, then must not hospital pharmacy chart a course which encourages manufacturing? This is an important question. A profession cannot continue to be a profession unless a significant proportion of its practitioners utilizes the knowledge and skills which underlie it. This means that a large number of hospitals must have adequate facilities and equipment for manufacturing. Manned by well-qualified personnel, these must be the training grounds for the career hospital pharmacists of the future.

This implies, of course, that the scope of manufacturing programs in hospital pharmacies must be expanded so that a significant number of hospital pharmacists prepares some of the more complex dosage forms. Here we use the term "more complex" not in the sense of the most complex dosage forms such as sustained release medication but rather, in the sense that relatively few hospital pharmacists now attempt to prepare a dosage form more complex than a solution. Obviously, the objectives of patient

service, patterns of professional practice, and research cannot be carried very far under such limitations.

But the development of a manufacturing program is a gradual process requiring knowledge, experience, equipment, and other facilities. This study shows (Chapter VII) the great need and opportunity for pharmacists to assume more responsibility for the preparation of sterile products. All hospitals use these products in large volume and today non-pharmacists play the dominant role in this area. Perhaps this is one of the best places for many hospital pharmacists to start. But simultaneously, they should develop a plan for the assay and control of these products. Development of well-designed sterile products programs in hospital pharmacies should lead to deeper involvement not only in professional practice but in control methods, product formulation, collaborative investigations with the medical staff, and research.

In order to improve basically the quality and to expand the scope of products manufactured, however, the American Society of Hospital Pharmacists should establish a central laboratory for the formulation and testing of medicinal products commonly used and readily prepared in hospital pharmacies.* While the central laboratory would initiate and coordinate projects and make the final evaluation of the formulations proposed, much of the work could be assigned to pharmacists in teaching hospitals and in colleges of pharmacy with specialized programs for the education and training of hospital pharmacists. Such projects would be a welcome and useful part of the pharmacy resident's education and training. Preferably all such projects should be carried out cooperatively with the medical staff and products should undergo clinical as well as pharmaceutical evaluation.

Formulas developed should indicate, specifically, methods of preparation, precautions, preservatives, methods of sterilization where indicated, thermostability of the product, required stabilizing agents when these are necessary, methods of assay and pharmaceutical testing, etc. The tested formulas thus developed would be compiled and published in book form so that they would be readily available.

The result of such a coordinated program would have great impact upon increasing the value of the pharmacist to the hospital and the patients it serves, influencing the education and training of future hospital pharmacists, setting a pattern of professional practice which would attract greater numbers of highly motivated, well-qualified pharmacists to hospital practice, and raising the standards of the practice of pharmacy in hospitals. It would also establish a means whereby practicing pharmacists and members of the allied health professions, principally physicians, may work cooperatively on the development and clinical evaluation of medications. It would also lead the hospital pharmacist into assay, pharmaceutical testing, and research.

Another very important consideration in the development of a manufacturing program is the attitude of the hospital pharmacist. Manufacturing should be considered a part of the professional practice of hospital pharmacy. The objective of manufacturing should be primarily patient service, not economy. This patient service cannot be provided if proper equipment or facilities are not available for use, and if hospital pharmacists do not have the training and experience in using them. The necessary equipment and facilities, including control, should be an integral part of a pharmacy department and their cost considered a part of the cost of the pharmacy service.

Within this framework, then, there may be great variations in the equipment and facilities available in hospitals of different types and sizes. One would expect the larger teaching hospitals to have extensive facilities and equipment while the smaller community hospitals would have minimum facilities. The questions of equipment and facilities and the amount and types of products which may be prepared in hospital pharmacies of different types and sizes are ones that require further study. This can be done best perhaps through well-designed demonstration projects which employ the practices as outlined by the Food and Drug Administration in its regulations dealing with good manufacturing practice.

2.9 Assay and Control

We now turn to the matter of assay and control in hospital pharmacies. Essentially the findings of this survey show that pharmaceutical assay and testing and control procedures in hospital pharmacies are extremely poor. Some of the reasons for this weakness are discussed in Chapter VII.

This weakness in control procedures is an interesting, although unfortunate, situation. There are probably several considerations underlying it. One is the practice of American pharmacists to accept without question the quality of products as labeled by a commercial manufacturer. This is not true in European pharmacies where it is the general practice to assay all chemicals purchased by the pharmacy for manufacturing purposes, or to purchase only certified chemicals and to limit tests to those of identification.

One of the basic principles of the profession is the responsibility of the pharmacist for the strength, quality, and purity of the drugs he dispenses. This applies to all drugs; those purchased from commercial sources, those extemporaneously compounded as individual prescriptions, and those manufactured in bulk quantities in the hospital pharmacy.

Quality of purchased pharmaceuticals is ensured by selecting reliable sources of supply and in performing analytical and pharmaceutical tests in selected cases. The quality of medicinals prepared

* Most of the suggestions here were proposed in 1954. See Francke, D. E.: A Proposal for a National Hospital Formulary Service, *Bull. Am. Soc. Hosp. Pharm. 11*:328 (Sept.-Oct.) 1954.

in the pharmacy is best assured by adopting and implementing an administrative policy of control which is broad enough to encompass all steps leading to the finished product and one which imbues the pharmacists with their responsibility as members of a profession and fosters pride in the products of their hands. Thus, quality control may be thought of as a system of procedures and checks established in the hospital pharmacy to assure the identity, strength, quality, and purity of the finished product.

The larger a pharmacy department becomes and the more people involved in the various processes of manufacturing, packaging, and labeling, the more need there is for increasingly rigid control procedures. This is one of the reasons the pharmaceutical industry has developed a system of rigid controls. Of course, it must be recognized that in the pharmaceutical industry many of those who carry out the various processes of manufacture are not pharmacists and, thus, the need for controls is even greater. Still, if one considers the problem in hospitals, there is no reason why a system of control procedures cannot be used even in the hospital with only one pharmacist, although here the problem is more difficult. However, a complex network of analytical laboratory facilities, equipment, and trained technical people is present within the hospital organization. Chemical analyses, sterility testing, and biological assays are routine operations in the modern hospital. Thus, through cooperative efforts, a sound program for quality control could be developed.

Control and assay procedures become more and more important as hospitals become increasingly the centers of community health practice and as the utilization and distribution become more concentrated in these centers. Control and assay procedures are needed not only for pharmaceutical preparations prepared in hospitals but also for drugs purchased from certain commercial sources. The latter need is evident particularly in those hospitals where, by law or by policy, drugs must be obtained from the lowest bidder meeting specifications. Facilities for examining the drugs against specifications must be available if this system prevails.

Too often, the control of pharmaceuticals is looked upon as the testing or assay of the final product. But this is not the complete story. One cannot assay or inspect quality into a product. In fact, it is quite possible for a medicinal preparation to assay at 100 percent potency and still not be therapeutically effective if its pharmaceutical properties are not correct. Rather, control of the product begins with the purchase of the basic ingredients and continues step by step throughout all manufacturing processes and includes all activities which contribute to the quality of the finished product.

Good records are an essential part of manufacturing control. These are not limited to the record of tests made, but include a complete history of the medicine from the beginning to the end of its preparation. Thus, such records must start with the specifications for the quality of the ingredients employed and the sources from which they are purchased. They indicate the name, quality, and quantity of each ingredient used, and identify the manufacturer and his lot number. They state the methods of preparation or processing, preservation, packaging, labeling, etc., employed in making the preparation. They identify the individual making each measurement or weighing or performing each step of the procedure, and record the results of all assays or tests.

All hospital pharmacies regardless of size can and should have a control program. It may be simple or complex depending upon the needs of the individual hospital. But it is important for the pharmacist in charge to say, "We will have a control program" for this commitment puts into motion the general philosophy of control and leads inevitably to the procurement, production, and dispensing of medicines of better quality. This important commitment is the responsibility of the director of pharmacy service and one which the profession must actively encourage, even demand.

The lead in this matter should be taken by the larger, and especially, the university teaching hospitals. Training in these areas should be made a more important part of hospital pharmacy internship or residency programs. A study group should investigate the need for a manual on recommended control procedures and a system of records for products manufactured in hospital pharmacies. Hospital pharmacists should be encouraged to establish demonstration projects in which good control procedures are related directly to products manufactured and dispensed and to a selected number of purchased pharmaceuticals. But perhaps most important, greater stress should be laid on the principle that the hospital pharmacist is responsible for the quality of drugs he dispenses, whether these drugs are purchased from outside sources or prepared in the pharmacy. Once the significance of this fundamental professional responsibility becomes an integral part of the hospital pharmacists' creed, better patient care and a higher level of hospital pharmacy practice will follow.

2.10 Research and Investigations

Since the record of hospital pharmacists in analytical control is very poor, could one expect that their record in conducting investigations and research would be otherwise? There is a direct relationship between analysis and research. If a hospital pharmacy does not have the facilities for analysis, scientific research cannot be done, nor can any but the most elementary product formulation. Before hospital pharmacists can do worthwhile research or product formulation they must have facilities for analysis and use them routinely. The establishment of an assay and control unit in hospital pharmacies will set into motion a program which will lead quite naturally to greater involvement in research.

Results of this survey show that hospital pharmacists have a great interest in product development and that many do some work in this field. We did not obtain any information upon which to evaluate the quality of the work done. However, from the few reports which have appeared in the literature during recent years, we can accept that some of the work is good. On the other hand, we suspect that much of the effort toward product formulation is often characterized by an empirical approach without full recognition of the importance of preliminary investigation and knowledge of the chemical, physical, and biological properties of the drug and the vehicles and excipients used, and without a clear understanding of the desired characteristics of the final product. If this is true, hospital pharmacists need to gain a far greater appreciation of what is involved in product formulation if they are to adequately perform this professional function.

Physicians, particularly those in teaching and research hospitals, are constantly requesting new products and help in the way of formulations of investigational drugs. Thus, there is little question that many hospital pharmacists have abounding opportunities for product formulation. To meet these requests in a scientifically competent manner is one of the big challenging opportunities for which hospital pharmacists must prepare themselves.

But far broader opportunities for scientific research exist in hospital pharmacies. Of course, these are greatest in the two or three hundred hospitals where teaching and research are daily routines. But with few exceptions, the literature shows few American hospital pharmacists making contributions through research. In sharp contrast, European, and especially Continental, hospital pharmacists for years have made significant research contributions in great number. The reasons for this difference are not altogether clear. The high educational standards of some countries are, we believe, an important consideration. But the British hospital pharmacists, whose educational background is quite similar to that of their American colleagues, do considerably more research than we. One would expect that the lead in research projects would be taken by pharmacists in university teaching hospitals; however, the results to date are disappointing. Even the fairly large number of recent graduates with advanced degrees has made but little difference to the amount or quality of research done in hospital pharmacies. The major change will take place in this area when pharmacists associated with research and teaching hospitals make research one of their basic objectives and provide the facilities and manpower to carry it out. As Dean Glenn L. Jenkins of Purdue has pointed out, "Several pharmacies should have full-time research pharmacists to carry on departmental projects and to work with other research teams in the hospitals . . . ."

Of course, the whole area of research in hospital pharmacy raises the question of the educational qualifications for research. Many educators hold the opinion that only those trained at the Ph.D. level are qualified for research. Undoubtedly, training at the Doctor of Philosophy level is essential for hospital pharmacists who wish to pursue research at its higher levels. Academic training involving a year or more of concentrated research taken under a professor with creative imagination and proved ability in research is unquestionably the best possible type of preparation. One may question, however, whether the Doctor of Philosophy degree is the complete or only answer for those in hospital pharmacy who wish to undertake research at some level. Much depends, of course, upon one's definition of research. But it is apparent that, in practice, much that is published by doctors of philosophy represents research at different levels. Can one not draw a parallel between those who have the professional degree of Doctor of Medicine and who conduct significant research, and those who obtain a Doctor of Pharmacy degree under the six-year program? The degree of Doctor of Medicine is, of course, not a research degree. Still, significant research is done by possessors of this non-research degree. In fact, more than 50 percent of the faculties of many medical schools do not have research degrees. True, physicians doing more basic types of research tend to serve as directors or coordinators of projects employing others with Doctor of Philosophy degrees. Within this framework the physician gives good direction because of his knowledge of the scope and ramifications of the problem. The Ph.D.'s add strength and also direction because of their specialized knowledge of the subject and of the methodology of research. From this it would appear that an individual with an excellent educational background in the basic sciences upon which his profession is founded could, with proper motivation and opportunity, conduct significant research. However, the truth of this postulate, as far as pharmacy is concerned, remains to be proved. And what about the individual with the Master of Science degree? Is he not capable of research at some level?

In addition to research in the pharmaceutical sciences, there are, of course, several other types of research which the hospital pharmacist is in a position to do. The modern hospital complex provides an ideal setting for studies on statistical evaluation of drug usage, prescribing habits and their origin, relationships between drugs prescribed and diagnosis, and similar topics. Also there are large areas for investigation in what may be termed the sociology of the health sciences including pharmacy. Administrative and professional problems and patterns of drug distribution, medication errors, patient safety, and related questions represent other important areas for investigation. To date the main areas of investigation or research done by hospital pharmacists appear to be administrative or management in nature. These are important, but not so important that their pursuit should lead to the neglect of research representing contributions to the pharmaceutical sciences.

Adapting the pattern of hospital pharmacy practice to promote research will be a complex undertaking. The American Society of Hospital Pharmacists has taken the first step by stating in its Constitution and Bylaws that one of its objectives is to "promote research in hospital pharmacy practices and in pharmaceutical problems in general." But to state an objective is one thing; to accomplish it is more difficult. The role of the hospital pharmacist in research requires careful consideration and planning. We predict that the lack of research tradition among American hospital pharmacists will be overcome—but not in a day or even a decade.

2.11 Service to Hospitals without Pharmacists

As noted in Chapter X, almost 4700 hospitals in the United States lack the services of a full-time pharmacist. In about half of these there is no pharmacist involved in any way with the drug service. In only about 1 of 10 of these hospitals does a pharmacist come to the institution to provide service, others obtain part of their pharmacy service from a local community pharmacist but rely heavily on non-pharmacist personnel in the hospital to handle drugs.

Hospital pharmacists now tend to limit their services to other hospitals without a pharmacist to those of an advisor or consultant. Only about 2 pharmacists in 10 provide this advisory service; however, 7 out of 10 would like to do so. Thus, great motivation exists for an expansion of this consulting service but probably no significant steps in this direction will be made unless the American Society of Hospital Pharmacists and the national hospital associations work out a plan of action.

There is, however, great need for the direct professional services of a pharmacist in these hospitals, even if the need be limited to a few hours a week. We believe that existing hospital pharmacies could greatly expand their scope of service to small hospitals, nursing homes, and other institutions which require pharmaceutical service. In some cases a pharmacist in a single hospital could set up pharmacies or drug rooms in one, or perhaps even in several, nearby institutions. The chief pharmacist or a member of his staff could provide a certain amount of direct professional service and also supply prepackaged and prelabeled medication, exercise control over the methods of handling drugs, provide consulting and drug information service, and help in other ways. Servicing these satellite pharmacies may permit him to employ an additional pharmacist full-time or part-time in his own institution, depending upon the number of institutions served. In essence, he would assume responsibility for pharmacy service in these other institutions although he would undoubtedly have a member of his staff make most of the visits to the other hospitals. This plan would be advantageous to small hospitals because they would be able to contract with another hospital for their pharmacy service and thus be able to turn over to an experienced hospital pharmacist responsibility for pharmacy service. To the hospital providing this service, this plan should permit it to strengthen its pharmacy staff and possibly expand its scope of pharmaceutical service, offer better incentives to its chief pharmacist and contribute more broadly to community health. This plan would, of course, necessitate the employment of additional hospital pharmacists. It thus has implications for manpower needs and for the education and training of pharmacists. However, we believe that this program will still not meet the total needs of small hospitals and related health care institutions. Further suggestions concerning pharmacy service to these institutions will be discussed separately.

3

RECOMMENDATIONS PERTAINING TO ADVISORY AND TEACHING FUNCTIONS

This group of recommendations deals with those professional activities which are concerned more with words than with actions. Included is the role of the hospital pharmacist as a consultant on drugs to the medical, nursing and related staffs, individually and through the pharmacy and therapeutics committee; his role as a teacher to nurses, medical interns, residents and staff, to pharmacy students and perhaps others; his role as preceptor for pharmacy interns, residents and staff; and his overall advisory functions to all groups in the hospital, including administration, as well as to research workers who seek his counsel.

3.1 The Recommendations

19 Communications with Medical Staff. It is recommended that hospital pharmacists be encouraged to utilize more fully the pharmacy and therapeutics committee in improving formal communications and relationships with the medical staff. (7.23)

20 Communications with Nursing Staff. It is recommended that hospital pharmacists consider the desirability of a joint pharmacy-nursing committee to improve communications and strengthen interprofessional relationships in their hospitals. (7.24)

21 Role as Consultant. It is recommended that hospital pharmacists more fully recognize the importance of their role as consultants on matters pertaining to drugs, that they commit themselves to the task of improving their ability to assume this role, and that they make efforts to assemble and organize the bibliographic resources to enable them to perform this function properly and expeditiously. (7.16)

22 Drug Information Center. It is recommended that drug information centers be established in hospital pharmacies of appropriate size to provide comprehensive pharmaceutical and drug information related to patient care, teaching and research to the medical and allied staffs. (7.17)

23 Expand Teaching Role. It is recommended that hospital pharmacists expand their teaching role within the hospital and its associated units. (7.18)

24 Organized Resource Material for Teaching. It is recommended that a study group examine the need for and recommend means of developing organized resource material, such as outlines for lectures or for courses, to enable hospital pharmacists to improve the quality and extent of their participation in the teaching program of the hospital. (7.19)

25 Formation of Pharmacy and Therapeutics Committees. It is recommended that hospitals lacking a pharmacy and therapeutics committee of the medical staff establish such a committee, and that hospital pharmacists take the initiative, through proper administrative channels, in encouraging its formation. (8.1)

26 Activation of Established Committees. It is recommended (1) that all pharmacy and therapeutics committees establish a policy of meeting several times a year and (2) that chief pharmacists make continuing efforts to stimulate this activity by bringing to the attention of existing committees matters which should be given consideration and by helping to develop current and long-range programs for the committee. (8.2)

27 Scope of Activities. It is recommended that pharmacy and therapeutics committees increase their scope of activities to include essentially all matters related to drugs and that particular attention be given to (1) the promotion of rational drug therapy through the clinical appraisal of drugs, the evaluation of drug literature, the dissemination of drug information, periodic audits of medical records relating diagnosis to drugs prescribed, and by other means, and (2) a consideration of matters affecting patient safety such as the importance of careful order writing to avoid medication errors, the handling of investigational drugs, the preparation of parenteral admixtures by nurses and so forth. (8.4)

28 Role of the Pharmacist. It is recommended that the American Society of Hospital Pharmacists carry out a study of pharmacy and therapeutics committee activities with special reference to (1) the scope of functions which should be performed, (2) the role of the pharmacist on this committee, particularly his role in encouraging rational drug therapy, in the evaluation of pharmaceutical dosage forms, and in promoting safety practices relative to the handling and use of drugs in hospitals, and (3) compile a manual of policies and procedures and other aids which the pharmacist may use as reference to help him better fulfill his role. (8.5)

29 Minutes of Meetings. It is recommended that minutes of the activities of the pharmacy and therapeutics committee be maintained and be available to all interested medical staff personnel. (8.3)

30 Use of Nonproprietary Names. It is recommended that pharmacy and therapeutics committees adopt the policy of accepting drugs officially into the hospital's formulary under their nonproprietary names, even though trade names may be used as synonyms and as aids to prescribing and identifying drugs. (8.8)

31 Simplified Nonproprietary Names. It is recommended that the American Society of Hospital Pharmacists work with the Drug Nomenclature Committee of the American Medical Association, United States Pharmacopeia, and the National Formulary to develop simplified nonproprietary nomenclature. (8.10)

32 Authority for Nonproprietary Names. It is recommended that when medical staffs authorize the pharmacist to dispense drugs under their nonproprietary names when trade name drugs are prescribed, (1) this authorization be given in writing in a form approved by hospital attorneys, and (2) provision be made within this policy for a physician to obtain a particular manufacturer's product when he deems it important to the care of his patient. (8.9)

33 Product Duplication. It is recommended that pharmacy and therapeutics committees review periodically the extent of product duplication in their hospitals with the objective of eliminating unnecessary duplications and retaining purposeful duplication of products, and that the initiative for this review be taken by the chief pharmacist. (8.11)

34 Flexibility of Formulary System. It is recommended that pharmacy and therapeutics committees and chief pharmacists review their procedures of handling requests for drugs not stocked in the pharmacy, and that procedures be developed so that prescribed medication may be obtained for patients without undue delay, still retaining an orderly procedure for the selection and appraisal of therapeutic agents. (8.12)

35 Responsibility for Formularies. It is recommended that hospital formularies or drug lists be prepared or adopted only under the auspices of the medical staff, working through the pharmacy and therapeutics committee, and should not be established solely as a principal responsibility of pharmacy or administration. (8.6)

36 Formulary Service. It is recommended that pharmacy and therapeutics committees of medical staffs be encouraged to use the *American Hospital Formulary Service* as a time-saving tool in compiling individual hospital formularies. (8.7)

37 Community Pharmacists on Pharmacy and Therapeutics Committees. It is recommended that pharmacists holding part-time positions in hospitals become acquainted with the objectives and functions of the pharmacy and therapeutics committee and the role of the pharmacist thereon and offer their services as secretary of the committee and coordinator of its activities. (10.9)

38 Nursing Representative on Pharmacy and Therapeutics Committee. It is recommended that the pharmacy and therapeutics committee include a representative of the nursing service on its membership. (8.13)

We note that these recommendations may be arranged into five groups with two recommendations dealing with communications. Two relate to the consulting role of the hospital pharmacist and two relate to his teaching role, one concerns his role as a preceptor of pharmacy interns or residents, and thirteen deal with the pharmacy and therapeutics committee or formulary. These professional activities find their roots in the depth and scope of knowledge possessed by the pharmacist and in his ability to perceive interrelationships. These are activities in which thoughts and words are more important than direct acts.

3.2 Professional Communications

The findings of this survey show that hospital pharmacists feel their relationships with the medical and nursing staffs are somewhat less favorable than those with administration (Chapter VII). This is not too surprising. The organizational lines of communication between the pharmacist and administration are more direct, less confusing and, in general, easier to use in the sense that responsibility for action or inaction can be delineated more clearly. In contrast, effective communication with the medical or nursing staff is more difficult. With nurses, the pharmacist's lines of communication are centralized in the case of the nursing department and decentralized in the case of individual nursing units. Written policies and procedures known, understood, and followed underlie effective communications. Nevertheless, less than half of the pharmacists responding to this survey have developed written policies and procedures for their department. Also, pharmacists seldom visit nursing units to make an inspection of drugs and thus lose opportunities to further develop communications with the nursing staff. The teaching of courses or presenting lectures to student and graduate nurses also tends to promote communications, but only about 1 pharmacist in 4 engages in this activity. Positive steps by hospital pharmacists in the three areas of written policies and procedures, inspection of drugs on nursing units, and teaching would strengthen greatly communications between pharmacy and nursing.

In addition, a representative of the nursing department should serve on the pharmacy and therapeutics committee. The nurse's daily role in handling and administering drugs to patients on nursing units places her in a position to contribute greatly to the work of this committee. Her duties make her, in effect, the agent of the physician and she is often aware of problems relating to drugs which escape notice of both the physician and pharmacist. When problems concerning pharmacy service to hospitalized patients or the handling of drugs on the nursing units arise, she is usually the first to know them. Establishment of regular channels for her to communicate these problems would tend to greatly improve patient service. Consideration should also be given to the establishment of joint pharmacy-nursing committees to further interprofessional relationships and improve communications.

In the case of physicians, effective communication is difficult due principally to two factors. Despite the existence of policies and procedures formulated and approved by the medical staff, individual physicians often tend to take exception to them either purposely or through oversight. In some cases the physician believes it is desirable to make an exception to established policy or procedure because of some unusual requirement of his patient or the existence of an extenuating circumstance. These professional prerogatives of the physician are essential for good patient care and must be preserved. On the other hand, it is necessary to determine when a physician is exercising a prerogative and when he is merely failing to follow established procedures through oversight.

A second factor which makes communications with the medical staff difficult lies in the nature of medical practice itself. Each physician is an independent professional man exercising independent judgments as the needs of his patient dictate. His judgment, for example, in the use of drugs, cannot be seriously questioned though he may sometimes predicate it on incomplete, erroneous, or misleading information. The best that can be done is to supply him with correct and complete information. Thus, the hospital pharmacist is required continuously to communicate with relatively large numbers of physicians each of whom practices his profession independently, though perhaps in association with others. Effective communication is particularly difficult when the pharmacist in an open-staff hospital must deal with a number of physicians who simultaneously practice from their private offices and in other hospitals where policies and procedures vary; and it is also difficult for these physicians.

Thus, the hospital pharmacist must establish and maintain communications with the medical staff as a group and with the individuals comprising the group. Fundamental to this objective is the establishment of policies and procedures approved by the medical staff relative to the procurement and dispensing of drugs. This sets ground rules well understood by both physicians and pharmacists. It simplifies communications to the extent that only exceptions from these policies and procedures need to be discussed with individual physicians. On the other hand, lack of agreed-upon policies and procedures provokes misunderstanding and makes effective communication exceedingly difficult.

In communicating with the medical staff, hospital pharmacists tend to under use the medium of the pharmacy and therapeutics committee and to rely too strongly upon the administrator to present problems related to drugs or the pharmacy to the medical staff. This practice tends to destroy the objective the committee was established to foster. More effective communications would result if the pharmacy and therapeutics committee considered all problems

related to drugs and reported their recommendations to the medical staff for action. In those matters which are primarily of an administrative nature or affect the hospital's budget, the committee should seek guidance from the administrator—and certainly the pharmacist should anticipate these problems and help assemble background material.

Although we did not determine in our survey the number of hospital pharmacists who routinely issue a drug information bulletin, the information in Table 87 (Chapter VIII) implies that a relatively small percentage of pharmacists do issue these bulletins to the medical and nursing staffs. While these drug information bulletins take on many forms, all of them are means of effective communications. Some are issued officially by the pharmacy and therapeutics committee, others are published by the pharmacy department. Regardless of the authority under which they are issued, they serve as an invaluable tool to inform physicians, dentists, nurses, pharmacists, and others of actions taken by the pharmacy and therapeutics committee, of new drugs approved for use or for trial, of investigational drugs, of new policies and procedures, of adverse reactions to drugs and a wealth of other material. They represent, in fact, a much more effective means of communication than distribution of the official minutes of the pharmacy and therapeutics committee meetings since the latter are restricted to items discussed by the committee, while the drug bulletin can contain a much broader selection of subjects limited only by the imagination of the chief pharmacist and the practical limitation of size.

In addition, one must stress the very important role in effective communications played by the hospital's formulary, if it is kept current as it now easily can be by the monograph supplement service issued regularly by the *American Hospital Formulary Service*. With this service available, hospital pharmacists need only devote a small amount of time in the preparation of individual drug monographs.

One additional matter concerning communications between pharmacists and physicians should be mentioned. This is the difference between their relationships and roles in the hospital in contrast to that existing between physicians and pharmacists in community practice. In the latter case the pharmacist is greatly dependent upon the good will of the physician for his prescription practice. This, in turn, tends to make the pharmacist hesitate to fully express himself for fear of losing favor with the physician and seeing his business suffer as a result. In contrast, the hospital pharmacist feels more free to take the initiative in advising the physician since he is not necessarily dependent on the physician's good will for the number of prescriptions he fills. This does not mean, of course, that he is independent of the physician's good will nor that this is not important, for it is. But it does mean that the relationships between the hospital pharmacist and the physician can be more free and on a basis where each recognizes more fully the other's role, uncomplicated by pecuniary considerations. Within this relationship, then, the hospital pharmacist will be successful only if he deals with the physician from the strength of his knowledge. His greatest authority is the authority of ideas. The role of the well-informed hospital pharmacist is readily accepted by physicians.

3.3 Advisory or Consulting Role

Results of this survey show that hospital pharmacists are called upon to provide a wide variety of information on drugs. The type of information furnished most frequently relates to dosage and dosage forms. More difficult pharmacologic data is furnished less frequently. Our survey did not determine the depth of knowledge required by the hospital pharmacist to perform his role as consultant.

During the past several years there has been much debate in the profession on the role of the pharmacist as an advisor or consultant to the medical profession. Considerable confusion exists because of various interpretations of these roles when the same words are used to describe them. In dealing with the medical profession, the pharmacist gives essentially two types of advisory services. He gives information and he gives advice or counsel. Often the giving of one leads to the giving of the other. But information may be given, without giving advice or counsel. Seldom is the reverse true.

One may think of giving information as an act involving the stating of a fact or the imparting of knowledge of a particular situation, the statement of which requires from the informant an ability to use only his broad, general professional background and knowledge but does not require a knowledge of the physical, chemical, or biological behavior of drugs. The informant role is represented by such questions as: "What size meprobamate tablets do you have and what is their price per hundred," or "Whose brand of prednisone are we using," or "What company markets PAM," or "What does Bosphorus contain?"

The informant role of the pharmacist is very important because, as this study shows, questions of this type are among those most frequently asked. Some may say that it requires little knowledge to answer questions of this type, and when the questions are taken singly or in small groups, as examples, this may appear true. However, if one considers the wide range and the great number of possible questions of this type, one must concede that a fairly great breadth of professional knowledge is required of a pharmacist who handles them adequately. But, more important, the proper handling of these questions often leads to deeper involvement of the pharmacist in an advisory or consultant function. Thus, the importance of the informant role lies in its quantitative aspects and in the fact that it serves often as a prelude to the consulting role.

An advisor or consultant is one who gives professional advice or services in the field of his specialized knowledge or training. Thus, a consultant is, by definition or implication, an expert in his field. He

possesses theoretical and practical knowledge gained by study and experience and the combination of these develops within him the capacity for making professional judgments. The pharmacist's knowledge and training in the physical and biological sciences provide him with a good background upon which to base professional judgments. His specialized training in the physical sciences gives him an area of knowledge in which his expertness exceeds that of the physician. Courses in the biological sciences, especially biochemistry and pharmacology, provide him with areas of knowledge which he shares on approximately an equal, and often superior, basis with the physician. In pharmacology the two professions meet on common grounds; the physician superior in terms of his overall biological background, the pharmacist superior in terms of his background in the physical sciences. Within this framework of compensating strengths lies the opportunity of the hospital pharmacist to make contributions based on knowledge uniquely his—that is, knowledge of the physical, chemical, and biological properties of drugs. Obviously some questions do not lend themselves to application of this knowledge. Others do as, for example, questions dealing with compatibility, milliequivalents, the absorption, distribution, and fate of drugs in the body, duration of action, side effects, contraindications and antidotes. A large majority of hospital pharmacists in their conversations with physicians are able to handle questions of this type readily.

The pharmacist's consulting role becomes somewhat more complex when the questions call upon him to discriminate among a group of drugs and to render a professional judgment as to the drug of choice for a particular patient. Still, many pharmacists can and do answer questions which require them to provide the physician a discriminative evaluation of a group of drugs; however, few feel they can accept the responsibility of indicating the drug of choice. They may, in fact, even recommend the drug they consider the one of choice but they do so with the knowledge that they know little or nothing about the particular patient upon whom the drug is to be used and, therefore, cannot be specific. In effect they are saying to the physician, "These are the facts about this group of drugs. I have compared and contrasted their properties for you; from what you have told me about your patient I believe drug number one is the best one to use, although drug number two may be better for your patient in the long run; what is your decision?" Of course, when the pharmacist narrows a field of 30 or 40 drugs down to one or two he makes a great contribution to the physician and its importance should not be minimized.

There is a distinct and important difference between this type of consulting and that which might be done, for example, by a clinical pharmacologist or a specialist in internal medicine who has conducted investigational studies or who has personally observed the response of hundreds of patients to a group of drugs. These physicians have what the pharmacist lacks. This is first-hand knowledge of the effects of the drug on a large number of patients. Without this knowledge the pharmacist must always stop just short of being what some term a true therapeutic consultant. If we define a therapeutic consultant as one who authoritatively recommends the drug of choice to a physician after he describes the patient's condition, then we don't believe that the pharmacist is or ever will be in a position to assume this responsibility. And if he were, the physician cannot and would not and should not yield his responsibility to prescribe for his patient.

On the other hand, there are important areas in which the pharmacist may speak authoritatively. One of these is selecting and recommending pharmaceutical dosage forms. Here the pharmacist's specialized education and training and experience far exceeds the physician's.

He also has other roles in drug evaluation. The pharmacist can achieve great competence and speak authoritatively about drugs when his efforts are directed toward contrasting or comparing drugs within a group or helping to determine the relative importance of a new drug or combination. It is perhaps in this area that the pharmacist can be most helpful. Here he can often help the physician arrive at a drug of choice and then authoritatively recommend to him a suitable dosage form of the drug. Again, when the physician wishes to clinically evaluate a drug product, the pharmacist can assist him in setting up a well-designed study. These, together with advice on other questions which call for the use of the pharmacist's knowledge of the physical, chemical, and biological properties of drugs, represent very important professional contributions. The pharmacist can seldom, however, speak authoritatively when it comes to the choice of a drug itself for a particular patient. He can, however, authoritatively recommend a dosage form or brand of drug once the physician has made the choice of the drug to be used. Further, he has a professional and legal responsibility to prevent iatrogenesis (physician-induced injury) in drug therapy of patients.

If these statements are true, what then is the difference in the roles of the hospital pharmacist and the medical service representative? Does not the medical service representative serve as a therapeutic consultant to the physician? The answer is "no" with, perhaps as with the hospital pharmacist, rare exceptions. The detailman is selling or encouraging the use of a specific product made by a specific manufacturer. This may be a duplicate brand of other products, it may be a drug combination, or a different chemical entity with distinct characteristics. In performing this function he emphasizes the strong points and neglects to stress the points of his product. He does not compare and contrast objectively the of his product with those of his competitors. He does, however, emphasize a characteristic of his product which may give it a true or apparent advantage, but he doesn't stress those characteristics of his competitor's product which may put his in a poor light. Thus, his presentation is and must be greatly

biased. Only in rare instances does a company have such a superior product that its medical service representative finds it safe to truly compare and contrast his product with those of his competitors. The fact that so many physicians are so greatly influenced by sales efforts of medical service representatives suggests that few recognize the prime role of the detailmen. The great advantage of the hospital pharmacist over the medical service representative is that he can afford to be objective in the presentation of information.

Objectivity plus a wealth of knowledge of the physical, chemical, biological, and pharmacological properties of drugs is a hard combination to beat. The hospital pharmacist who possesses these can and should furnish the physician a great variety of information which will assist him to prescribe more selectively for his patient. Therein lies the role of the hospital pharmacist as a consultant to the physician. It is an important role and should be accepted as such. It can be performed effectively only by pharmacists who obtain the proper educational backgrounds and who adopt a plan of professional reading and study to keep abreast.

Within this framework, then, a great need exists for establishing a drug information center within the pharmacy department to provide a centralized unit from which the medical and allied staffs may obtain comprehensive pharmaceutical and drug information related to patient care, teaching, and research. These drug information centers would be staffed by pharmacists who are well prepared for the position by their educational background and by their personal interest in drug information sources.

Within these centers would be assembled various types of drug information sources: textbooks, journals, reprints, abstracts, review articles, catalogs, drug indexes, brochures, etc. These would be properly classified, cross-indexed, and filed so that the information would be readily available and could be rapidly gathered when requested.

One of the reasons for the need for a drug information center is that, for example, at a medical center, 100 to 500 physicians need drug information and these needs occur in a random pattern. There is not the need so much for more drug information sources as there is for the organization and centralization of information now available and for an experienced and well-qualified person to disseminate it. No individual physician can hope to maintain complete sources of drug information. But each of them can refer to a central source where he may obtain information on investigational drugs, drug reactions, symptoms of toxicity and antidotes, availability of drugs, comparisons and contrasts of groups of drugs, incompatibilities, milliequivalents, reports on individual drugs, and so forth. The establishment of drug information centers in charge of a pharmacist familiar with the drug literature can adequately meet the needs of physicians which arise from situations involving patient care, teaching, and research.

The University of Kentucky Medical Center and Ohio State University Hospitals have established drug information centers as part of the pharmacy department. Knowledge of the experience obtained at these centers should be utilized in starting others.

3.4 Teaching Role

Hospital pharmacists have made a beginning in contributing to the educational program of hospitals. However, despite their specialized knowledge which other professional groups in the hospital need to share, only about one hospital pharmacist in four engages in formal teaching activities.

Expansion of the hospital pharmacist's teaching role has several implications. First, one who teaches becomes more knowledgeable and otherwise better versed in his profession. Teaching also establishes and maintains professional relationships with allied professions and promotes effective communications among them. Third, the strength of both the teaching and consulting function rests upon the knowledge of the hospital pharmacist. Thus, each function tends to complement and strengthen the other. In many respects the consulting role of the pharmacist may be thought of as an informal teaching role. In this way the hospital pharmacist who teaches makes himself a better pharmacist in the process. Needless to say, his prestige and the respect others hold for him rise and, perhaps most important, the future strength of hospital pharmacy lies in its ability to develop practitioners who can deal with the medical and allied professions from a position of strength based upon their knowledge and judgment. Thus, the profession should make every effort to encourage hospital pharmacists to participate more fully and more deeply in the educational programs of their hospitals.

We believe the future will open greater opportunities to well-prepared and motivated hospital pharmacists in the teaching hospitals of universities which have a college of pharmacy. Here the hospital pharmacist will play a similar teaching role in pharmaceutical education to that exercised by the physician in medical education. The scientific foundations of medicine are taught from an academic point of view, not by practicing physicians, but, rather, by specialists holding Ph.D.'s in their particular area as, for example, anatomy, physiology, bacteriology, biochemistry, and pharmacology. Only after the medical student has the background of the basic medical sciences does the practicing physician, the M.D., enter the picture of medical education to contribute to his professional education.

In contrast, pharmacy schools tend to expect Ph.D.'s to teach both the scientific and professional courses. Thus, we have a large number of highly trained specialists with Ph.D.'s attempting to satisfy demands placed upon them to (1) train practicing pharmacists and (2) train pharmaceutical scientists at the graduate level. Since each of these objectives represents

separate areas of specialization, would it not be more reasonable to encourage the Ph.D. to concentrate his efforts on training future pharmacists in the basic pharmaceutical sciences and on training future pharmaceutical scientists in graduate areas of specialization? Under such a plan, Ph.D.'s would do research and teach courses in the basic pharmaceutical sciences including pharmacy, pharmaceutical chemistry, and pharmacology. This would mean that highly selected practicing pharmacists, probably those with a M.S. or Pharm.D. degree, would give instruction in the professional practice of pharmacy including such courses as pharmaceutical preparations, compounding and dispensing, jurisprudence, pharmacy administration, hospital pharmacy, and manufacturing pharmacy. In order to relate professional practice to scientific principles, these individuals would have to possess good backgrounds in mathematics, physical chemistry, and pharmaceutical sciences. Thus, those with professional degrees would collaborate with those with research degrees to round out the education of practicing pharmacists, as is done in medicine.

If this plan were adopted, students would receive instruction in the professional areas of pharmacy from those who have specialized in them. It is difficult for one to be a specialist in both the scientific and the professional areas of a profession, although much overlapping in knowledge is common, in fact, essential. In general, too, Ph.D.'s have higher motivations for teaching the basic sciences of pharmacy than for its professional areas. Their interest in research is usually great also; however, they often have such great demands placed upon their time to teach professional courses that their research efforts suffer.

There will undoubtedly be a certain amount of resistance to the adoption of any plan to have practicing pharmacists do any extensive amount of teaching in colleges of pharmacy. This is understandable. Not too many years ago, in both pharmacy and medicine, essentially all teaching was done by practitioners who were not qualified to teach basic scientific courses. However, with proper selection of faculty, the addition of practicing pharmacists to college faculties to teach professional courses would strengthen, not weaken, the colleges' total educational program. Certainly career hospital pharmacists with advanced degrees are, and will be, in strategic positions to contribute to the education of future practitioners of pharmacy, especially those hospital pharmacists practicing in teaching hospitals affiliated with universities which have a college of pharmacy.

3.5 Training of Pharmacy Interns or Residents

The subjects of professional education and training are discussed in Chapter IX. The training of future hospital pharmacists through internship or residency programs may be considered part of the teaching role. It is the teaching role of a practitioner of pharmacy; it is teaching by precept, by guidance, by training, both formalized and informal. Historically and traditionally, it represents one of the basic responsibilities which characterizes a profession. Pharmacy's practitioners as a whole have done so poorly in accepting this responsibility that the *General Report of the Pharmaceutical Survey* recommended that pharmacy internships be abolished, if they cannot be substantially improved.

On the other hand, hospital pharmacists as a group have done exceedingly well in developing a basic standard for the training of hospital pharmacy interns and residents and in setting up a plan for the accreditation of these training programs. They have thus, through their professional organization, recognized and given attention to one of the keystones of the profession. In turn, the American Society of Hospital Pharmacists has acted wisely in insisting that practitioners, as exemplified by the director of pharmacy service, assume complete responsibility for approved hospital pharmacy residency programs.

The great significance of the *Minimum Standard for Pharmacy Internship in Hospitals*, now the *Accreditation Standard for Residency in Hospital Pharmacy*, is that it was initiated and developed by a group of professional practitioners in an earnest desire to provide an organized, formalized, and meaningful period of specialized training for newcomers to the profession. With this major step taken, it is now principally a question of transferring concepts and ideas into practice and finding ways to improve constantly internship and residency programs. But these are major tasks.

First, hospital pharmacy needs to develop a larger number of pharmacists who appreciate the significance of training programs to the long-range development of the profession. They must view their internship or residency program as an essential part of an overall effort to advance the profession. While the attitude and motivations of the chief pharmacist are basic, so too are those of his supervisors, staff pharmacists and, indeed, the residents themselves. A top-flight training program is a cooperative project, not an individual effort.

At the same time, hospital pharmacy must guard against the establishment of too many training programs, especially those which cannot meet the educational and training objectives required. There is a definite need for a careful analysis of the needs for internship or residency programs to meet the manpower requirements for career hospital pharmacists with advanced degrees and for those with the basic Bachelor of Science degree.

This raises another problem. Is an inexperienced, newly graduated pharmacist able to take full advantage of a well-planned residency or internship program? Surely, there is a vast difference in the task of the preceptor in training a newly graduated unregistered pharmacist as against his task in training a registered pharmacist who has had sufficient prior training that he is competent to practice his profession at the basic level. The preceptor's task is to carry him far beyond this level. Can he do this with

a recent graduate who has not yet attained the basic level? Certainly not without far greater effort.

Another basic problem is to limit accredited training programs to hospital pharmacies offering a wide scope of professional service. Only in this way can the professional horizons of hospital pharmacy's new practitioners be expanded. A trainee who, for example, has not done extensive manufacturing of a wide variety of products, who has not worked intensively on product formulation, who has done nothing more than a few routine assays, who has not been exposed to good control systems, who has not examined carefully and recommended actions on several management problems, cannot be expected to contribute significantly to the growth of the profession in later years.

The selection of residents and an evaluation of their motivations and aptitudes for hospital pharmacy are topics which need consideration. It will not be too many years before a matching program, similar to that conducted by the American Council on Medical Education and Hospitals for medical interns, will prove valuable for hospital pharmacy. It should help to recruit better qualified residents to hospital pharmacy, aid preceptors in their selection, and influence the number of residencies available.

The development of strong residencies in hospital pharmacy is fundamental to the future of the profession and to the development of strong pharmaceutical services in the nation's hospitals.

3.6 Pharmacy and Therapeutics Committee and Formulary System

The pharmacy and therapeutics committee and the formulary system are discussed extensively in Chapter VIII. This committee considers essentially all matters related to the use of drugs in the hospital. Its scope includes such problems as: the evaluation of drugs and dosage forms; the safe use of investigational drugs; policies and procedures for selection, procurement, dispensing, labeling, availability, administration, and control of drugs throughout the hospital; and the encouragement of rational drug therapy. Thus, to this committee come requests for advice or recommendations for action from individual physicians, the medical staff as a whole, medical departments and sections, pharmacists, nurses, administrators, and purchasing agents.

One of the most significant findings of this section of the survey is the striking contrast between the work of active and inactive committees, active committees being arbitrarily defined as those which meet at least once a year. This contrast is shown clearly in Table 87. From these findings, one may with confidence, advise the hospital pharmacist to use his influence to see that a pharmacy and therapeutics committee is established, present problems to it and keep it active so that it meets several times a year, to do all he can to persuade it to adopt clear policies and procedures, and to make it fully an instrument of the medical staff. If this course of action is followed the inevitable result will be improved methods of handling drugs and the problems related to them in hospitals. The implications of this course of action are great not only to the various professional and administrative staffs but also to the patients they serve.

At the same time, one may advise the hospital pharmacist to use his influence to see that the formulary system is not abused, does not become a tool of others than physicians, that physicians' prerogatives be acknowledged and respected, and that undue delays and red tape in obtaining unusual medication for patients be avoided. Abuse of the formulary system by a few will tend to undermine the physician's confidence in the pharmacist and may be harmful to the patient.

The hospital pharmacist has an important role to play in all activities of the pharmacy and therapeutics committee. As its secretary he is an important officer of the committee and upon him rests responsibility for (1) working with the chairman in the preparation of the agenda for meetings, (2) assembling the data concerning drugs, policies, and other matters to be discussed, (3) entering actively into participation in the discussions, (4) recording in the minutes clear statements of the actions or decisions taken, (5) disseminating rapidly the results of the committee's deliberations to the hospital's professional and administrative staffs, and (6) following up and carrying out the decisions recommended by the committee and approved by the medical staff.

In playing his role the pharmacist's greatest asset is his depth of knowledge. He is primarily an advisor. A well-informed advisor is listened to and his advice is heeded. Active preparation for committee meetings, active participation in them followed by active dissemination of the actions taken, have great implications for maintaining effective communications among pharmacists, physicians, nurses and others concerned with the use of drugs in hospitals. An inactive pharmacist makes an inactive committee, and we have noted the vast differences in the accomplishments of active and inactive committees.

The scope of activity of most pharmacy and therapeutics committees should be expanded. Better teaching, better patient care, and better medical practice call for a continuous program of drug appraisal. One of the greatest needs of the medical profession is help in sorting out the better drugs from among the plethora of good, bad, and indifferent agents and combinations flooding it today. While this is a difficult task, recent developments in the methodology of drug evaluation provide a hopeful sign that definite progress is being made. The possibilities of applying electronic data processing methods to the evaluation of drug prescribing in hospitals indicate another step on the road to the continuous encouragement of rational drug therapy. The hospital pharmacist must participate actively in these projects.

Active participation implies close cooperation between the pharmacist and the medical staff. It im-

plies that the pharmacist possesses specialized knowledge of the methodology of drug evaluation and is able to discern the differences between careful, meaningful evaluations on the one hand and testimonials on the other. It implies that he can play an active role helping to devise good objective drug studies. Of course, the physician must make the judgment on the clinical value of the drug—whether this be from a reading of the literature or by personally conducting clinical studies. But the pharmacist, by his own knowledge of the methodology of drug evaluation and by his discernment, can help to make these judgments more meaningful. He can, in fact, accept responsibility for packaging, labeling, dispensing, and maintaining complete records on all investigational drugs used in the hospital, in addition to preparing dosage forms of these drugs.

It is, however, in the evaluation of pharmaceutical dosage forms that the pharmacist is particularly well qualified by his education and training in the physical and pharmaceutical sciences to offer expert advice to the medical staff. Here he possesses knowledge not held by the physician and thus, can play the role of a true consultant who can speak with authority. Acknowledgment of this specialized role of the pharmacist by the medical staffs of hospitals is shown by the findings that over 7 out of 10 active pharmacy and therapeutics committees delegate to the chief pharmacist responsibility for preparing specifications for drugs and for selecting acceptable sources of supply. This is, in effect, a recognition by the medical staff of the special knowledge of the pharmacist and an expression of its confidence in his ability and judgment. Paradoxically, the existence of this confidence and cooperation between physicians and pharmacists is recognized by few outside of hospitals. As a result, there is much needless hew and cry about "substitution," the loss of the physician's prerogative in selecting drugs, etc. Physicians are able to take care of themselves. They are scientifically trained men who do not hesitate to employ the special abilities of each of their trained associates. The hospital pharmacist does have special training and education and qualifications for the evaluation of pharmaceutical dosage forms. It would indeed be paradoxical if physicians did not recognize these abilities and delegate to him the responsibility for making certain judgments.

At the same time there are, outside of hospitals, certain groups in both pharmacy and medicine which minimize the pharmacist's abilities to evaluate pharmaceutical dosage forms. Recognizing this, hospital pharmacists would do well to prepare themselves even more fully to accept this professional responsibility which lies at the core of the reason for the existence of the pharmaceutical profession. Important basic principles underlie the acceptance of this responsibility, moral and professional principles, the exercise of which are the hallmark of a professional man.

This role of the hospital pharmacist in drug evaluations, clinical and pharmaceutical, is bound to increase as the number and complexity of drugs increase. As today's hospital pharmacists become better qualified through education and training to accept more and more responsibility in these areas, physicians will not hesitate to call upon them and to work with them as associates in the handling of drugs in hospitals. Particularly in the area of evaluation of pharmaceutical dosage forms and their procurement will the pharmacist be recognized and function as the most qualified authority in the hospital. Here he will base his professional judgment on the quality of the drugs themselves and on the reputation and facilities of the pharmaceutical manufacturer distributing them, not upon the appeal of their numerous proprietary names. He will keep in clear perspective the relationship between the reputation, integrity, and facilities of pharmaceutical manufacturers and quality pharmaceuticals, and remember that proprietary names do not make drugs—a pharmaceutical manufacturer does, and how he makes and controls them is important, not what he names them.

Many spokesmen for the drug industry use the term "generic equivalent" to imply drugs of inferior or questionable quality purchased from unreliable manufacturers. They imply that drugs sold or purchased under their nonproprietary names fall into the same category. Still, many of the top ten pharmaceutical manufacturers of the United States sell many, some over 50 percent, of their drug items as "generic equivalents!" Furthermore, what is questionable about the "generic equivalent" of, for example, tetracycline, reserpine, penicillin, methicillin, atropine, morphine, and streptomycin, when these are purchased from quality sources?

Depending upon the quantity of drugs used in the hospital and upon the nature of the individual drugs, hospitals will continue to employ the bid system of purchasing, some to a large extent, others seldom. In the process, many will employ the scientific nonproprietary or generic name coined by the Committee on Drug Nomenclature of the American Medical Association, United States Pharmacopeia and the National Formulary. This will be done despite the fact that many of these drugs can be obtained only from companies which distribute the drug under its trade name. Through the use of rigid specifications and by the careful selection of acceptable sources of supply, quality drugs will be obtained from quality pharmaceutical manufacturers bidding in competition with one another. Through such a plan, hospital pharmacy will make a major contribution toward preserving the free enterprise system which the pharmaceutical industry maintains, and with which hospital pharmacists agree, is an essential element to progress in the development of better, more effective drugs to serve humanity. As has been shown in this study, the need for duplicate products of the same basic drug is drastically reduced, inventories are lowered, and so are drug costs when the principles of bid purchasing and the formulary system are employed.

Availability of the *American Hospital Formulary Service*, issued since this survey was undertaken, has

major implications for hospital pharmacists. For the first time in American history, the tedious, time-consuming task of compiling individual hospital formularies is no longer necessary. Since this task usually fell upon the pharmacist, he is now free to devote this time to numerous other activities which cry out for his services.

An active pharmacy and therapeutics committee must consider many problems related to the use of drugs in hospitals. All are important, while some are complex. Nevertheless, they are ones which should make membership on this committee an exciting venture for any physician or pharmacist with more than average interest in the rational and safe use of drugs. In over 3 out of 4 hospitals, a ready tool awaits the hospital pharmacist who wishes to become more deeply involved in making significant professional contributions to better patient care.

4

RECOMMENDATIONS PERTAINING TO FACILITIES—SPACE, EQUIPMENT, AND MANPOWER

These recommendations deal with the physical layout and equipment of hospital pharmacies, professional and nonprofessional manpower needs for hospital pharmacy, including the role of the community pharmacist, and earnings of hospital pharmacists.

4.1 The Recommendations

39 Study Commission on Planning. It is recommended that a study commission be established to work with experts in the field of planning, automation, designing, and equipping hospital pharmacy facilties and that this commission be requested to study hospital pharmacy and related functions and to recommend the location and space which should be allotted as well as the equipment, including automated devices, needed to carry out these functions, bearing in mind the working relationships within the outside of the pharmacy department, and further, that high priority be given this project. (5.3)

40 U. S. Public Health Service Participation. It is recommended that the Division of Hospital and Medical Facilities of the U. S. Public Health Service be invited to participate in the work of the study commission mentioned in 39, and that the findings and recommendations of this commission form the basis for a series of suggested floor plans for pharmacies in hospitals of various size, where the functions and scope of service of the pharmacy vary, and that these floor plans be given wide distribution. (5.4)

41 Demonstration Projects. It is recommended that a number of demonstration projects be developed to show the effect of well-designed and equipped hospital pharmacy facilities upon the quality, scope, and cost of pharmaceutical service for patients. (5.5)

42 Public Health Service Plans. It is recommended that short-term hospitals with less than 100 beds and larger long-term hospitals be encouraged to use the Public Health Service's *Suggested Plans for Hospital Pharmacies in 50, 100 and 200 Bed General Hospitals* as a guide in planning the hospital area devoted to pharmacy activities until better plans are provided. (10.8)

43 Census of Hospital Pharmacists. It is recommended that an authoritative census of the number of pharmacists employed full-time and part-time in hospitals be made at least every five years in order to provide a realistic basis for the need of continued recruitment programs and to supply manpower information. (5.14)

44 Future Manpower Needs. It is recommended that the profession and especially the American Society of Hospital Pharmacists take suitable steps to attract sufficient pharmacists to hospital pharmacy practice to meet its present manpower needs and to provide for an adequate expansion in the number of pharmacists employed in hospitals, in accordance with the findings of the census. (5.15)

45 Registry of Women Pharmacists. It is recommended that the American Society of Hospital Pharmacists establish and maintain a registry of experienced women pharmacists who prefer to practice in hospitals on a part-time basis only, and that this information be made available to small hospitals and related institutions. (10.7)

46 Responsibility for Pharmaceutical Service. It is recommended that hospitals be encouraged to implement the principle that the pharmaceutical service be under the direction of a professionally competent, legally qualified pharmacist who will serve as a professional member of the staff responsible to the proper administrative authority of the hospital. (10.1)

47 Full-Time Pharmacists for Hospitals with 100 or More Beds. It is recommended that all short-term hospitals with 100 or more beds be encouraged to provide the services of a pharmacist on a full-time basis, since the need in hospitals of this size is self-evident. (5.7)

48 Role of Community Pharmacists. It is recommended that the profession develop a program to better acquaint community pharmacists with the duties and responsibilities expected of them when they provide pharmaceutical service to hospitals, and further, that community pharmacists be encouraged to accept part-time appointments in hospitals lacking the services of a pharmacist. (10.5)

49 Study of Long-Term Hospitals and Hospitals Under 100 Beds. It is recommended that the American Society of Hospital Pharmacists conduct a study to determine the characteristics of those long-term hospitals and of those short-term hospitals under 50 and between 50–99 beds which make it possible for them to employ a pharmacist full-time, and to contrast these with the characteristics of a random sample of hospitals of the same size which are without the services of a pharmacist, with the objective of recommending ways and means by which the service of a pharmacist may be made available to the latter hospitals on either a full-time or part-time basis. (5.8 and 10.2)

50 Satellite Pharmacies. It is recommended that demonstration projects be undertaken to show the possibility of establishing a coordinated pharmaceutical service between teaching or base hospitals with a pharmacist and other hospitals lacking the service of a pharmacist. In this study consideration should be given to the extent to which pharmacy service can be supplied by the former to the latter, including such services as on-the-spot consultations, control of drug distribution within the hospital, furnishing of prepackaged and prelabeled medication, procurement, inventory control, etc. (10.3)

51 ASHP-Sponsored Consulting and Training Programs. It is recommended that the American Society of Hospital Pharmacists provide consulting services and training programs for the establishment of pharmaceutical service in small hospitals and related health institutions according to their needs. (10.4)

52 Utilization of Nonprofessional Employees in the Pharmacy. It is recommended that a study be made of the possibilities of greater utilization of the nonprofessional employee in the hospital pharmacy so as to free the pharmacist from nonprofessional tasks and to permit him to expend as much of his available time as possible in developing the professional functions of his department. (5.9)

53 Realistic Salary Levels. It is recommended that hospitals be encouraged to establish realistic salary levels for staff pharmacists, which are at least equivalent to salaries paid by community pharmacies and that the salaries paid to chief pharmacists and assistant chief pharmacists be more commensurate with their responsibilities as professional department heads and with their management role in the hospital. (5.10)

54 Survey of Earnings of Hospital Pharmacists. It is recommended that a survey of the earnings of hospital pharmacists be made at least every five years in order to provide information for encouraging pharmacists to seek a career in hospital pharmacy and for developing the profession. (5.11)

55 Plans for Improvement of Pharmacy Service. It is recommended that chief pharmacists study now the functions, facilities, and staffing pattern of their own departments and develop specific plans for improvement, in light of present demands and opportunities for pharmacy service. (5.6)

56 Re-Assignment of Nurses. It is recommended that administrators and directors of nursing of small hospitals reevaluate their present programs whereby a significant amount of critically needed professional nurses' time is being spent in drug service activities instead of nursing functions, and that consideration be given to the appointment of either part-time or full-time pharmacists to assume responsibility for pharmacy service and thereby release nurses for nursing care activities. (10.10)

4.2 Hospital Pharmacy Facilities

It is evident from the findings discussed in Chapter V that great deficiencies exist in the amount of floor space devoted to pharmacy service in most short-term hospitals with 100 beds and over. Space allotments are extremely low in hospitals with 100 or more beds. This is true especially in the larger hospitals, those with more than 200 beds. The deficiency becomes more acute as the size of the hospital increases to 500 beds or more. This latter group is particularly important because it includes the great teaching and research hospitals of the country. Still, the amount of space allotted for pharmacy service in these hospitals, many of which have 700, 800, or 1000 or more beds, is little more than that suggested by the Public Health Service for a 200 bed hospital.

As noted in Chapter V, hospitals of the same size and type reported great variations in the amount of floor space for the pharmacy. For example, within some groups, certain hospitals had as much as ten times the amount of floor space reported by others. This implies that there is probably also great variation in the scope of service offered. We have seen, for example, that more than 50 percent of hospitals with 500 beds and over do not have floor space for a parenteral solutions laboratory, while over 20 percent have no space for manufacturing. Reasons for this great variation in floor space should be sought.

In view of these and related findings, we are recommending the appointment of a study commission to explore fully all questions related to hospital pharmacy facilities. To be of lasting value, this study must begin with the functions to be performed by the pharmacy and include some measures of the volume or quantity of activity predicted for each function. For example, while relatively few hospital pharmacies may undertake the preparation of injectable solutions, most of them should be involved in the preparation of sterile surgical and related types of solutions, and all of them should have facilities for utilizing aseptic technique. Again, hospitals which manufacture should have facilities for assay and control related to the scope of their manufacturing. Some hospital pharmacies should have facilities for research, depending upon the objectives or functions of the department. All of them should provide facilities for minor work in product formulation.

This study will be a healthy exercise for the profession of hospital pharmacy since its successful completion will involve basic consideration of both professional and administrative responsibilities. It should result in establishing more clearly defined and understood standards of professional practice—standards which will serve to guide the practitioner, the preceptor, the teacher, and the administrator of the hospital. Now, as is evident from this survey, there are vast differences in the quality and quantity of service performed in pharmacy departments of hospitals of the same size and type. Eventually, the standard of practice in hospital pharmacies should be raised and there should not be great variation due to the background of the pharmacist, the facilities available, and other reasons.

Once the profession accepts certain functions as being essential to good professional practice, these functions, considered separately and then collectively,

will form the basis for determining the space, equipment and other needed facilities. This information will also provide a basis for estimating the number of personnel required to produce a given volume of service. It will also be of great value in strengthening educational and training programs for hospital pharmacists, and for nonprofessional personnel. This task of delineating and clarifying the pharmacy service which may reasonably be expected in hospitals of various sizes and types may be considered as an extension of the principles laid down in the *Minimum Standard for Pharmacies in Hospitals.* It is a basic responsibility of practitioners of hospital pharmacy to lay down these standards of practice.

Then, a number of demonstration projects should be established to show the effect of well-designed and equipped pharmacy facilities upon the quality, scope, and cost of pharmaceutical service. Such demonstration projects would serve as models for the profession to follow. They could be used for educational and training purposes in the development of career hospital pharmacists. And, very important, they would set a pattern for pharmacy service which would accomplish in a few years what would ordinarily require several decades.

Recommendation 42 comes from the chapter dealing with drug service in hospitals without the services of a full-time pharmacist. The vast majority of these are either long-term hospitals or those short-term hospitals having less than 100 beds. Floor space for drugs in these hospitals appears to be sufficient for only a small drug closet. While other studies are needed relative to these hospitals, it was felt that a recommendation suggesting the use of the Public Health Service plans for hospital pharmacies would be a helpful interim measure.

4.3 Manpower Needs

In our survey we have predicted that by 1975 there will be more than 8500 pharmacists practicing full-time in hospitals and that more than 1000 new pharmacists will be required annually for replacement and growth (Chapter V). These, we believe, are conservative figures since they are based on present staffing patterns. Additional pharmacists would be required were hospitals, for example, to extend the hours when the services of a pharmacist are available, or if the scope of pharmacy service were broadened to include additional functions, or if more small hospitals employed pharmacists, or if hospital utilization were substantially increased as might be expected under expanded health insurance programs, or if ambulatory services for patients increased.

Our findings and predictions represent a basic change in the employment distribution of pharmacists in the United States. This means that planning must be done in order to fill future needs for pharmacists to provide service for patients in the nation's hospitals. To serve as a basis for good planning, we are recommending that a census be taken of hospital pharmacists employed full-time and part-time. This census should be repeated every five years so that trends may be noted and evaluated. The information thus obtained will help to guide plans for the recruitment of hospital pharmacists, to predict the need for seminars, institutes, and other types of educational programs, as well as for other basic professional studies.

In Chapter X we estimate that about 8000 people are engaged in supplying drug services in the 4665 hospitals without full-time pharmacists. These hospitals have great need for pharmacists to serve on a part-time basis, and one of the profession's largest reservoirs is the large number of trained women pharmacists who marry and leave full-time practice. Since during recent years the percentage of women enrolled in colleges of pharmacy has been increasing steadily, the size of this pool of trained pharmacists is bound to increase. These women, many highly skilled hospital pharmacists, represent a national resource for whom some plan should be worked out to utilize on a part-time basis, especially in the smaller hospitals where the need is great.

Manpower needs in hospitals with less than 100 beds represent additional needs beyond those calculated in this study. As pointed out in Chapter V, 1 out of 4 hospitals with 50–99 beds employs a pharmacist on a full-time or part-time basis, and 1 out of 3 hospitals with 75–99 beds does likewise. It is reasonable to assume that some additional hospitals in these groups could justify the services of a pharmacist. When this need is determined, the number of pharmacists required will be an addition to the figures calculated in Table 31, and may represent several hundred additional pharmacists.

If the growth in the number of pharmacists practicing in hospitals, as predicted in this study, occurs, it will have a great effect upon the profession of pharmacy as a whole and will place into sharper focus several current problems in hospital pharmacy. First, the number of new graduates of colleges of pharmacy who will go into hospital practice will increase. For example, in 1962 the colleges of pharmacy graduated 3545 pharmacists with a Bachelor of Science degree. If 794 of these were required for the staffing of hospitals it would represent 22.4 percent of those graduated.

Traditionally, American colleges of pharmacy have emphasized preparation of their students for community practice. It is likely that the colleges will need to more strongly emphasize preparation for hospital practice. There is a probability that some colleges of pharmacy would do this to a greater extent than others and, thus, we may see the rise of colleges specializing in the education of hospital pharmacists at the undergraduate as well as the graduate level. It is also possible that at least one new college of pharmacy specializing in the education of hospital pharmacists may arise. Although such a college could supply only a small fraction of the manpower needs, its educational program could be a pacesetter for those entering the specialty.

An increase in the number of hospital pharmacists will affect community pharmacy to the extent the number of facilities for the filling of outpatient prescriptions in hospitals increases. We believe these facilities are bound to increase and that increasing numbers of the American public will come to hospitals and outpatient clinic facilities for their medical care, including medication. It is not too unreasonable to predict that in the foreseeable future about 10,000 hospital pharmacists will be dispensing about 50 percent of the prescription drugs produced in the United States.

As the demand for pharmacists in hospitals increases, hospitals will need to carefully review the salaries offered to pharmacists and realistically adjust them if they are to compete successfully with financial opportunities offered pharmacists by other specialties and, more important, if they are to attract the better qualified pharmacists to hospital practice. In addition, hospitals must provide incentive benefits, particularly at supervisory levels, to retain the services of career oriented hospital pharmacists. It should be possible for more pharmacists to advance within the scope of hospital pharmacy—both in rank and pay—rather than to have to look to and prepare for a career in hospital administration as the line of progress to better financial advancement.

These manpower needs also provide challenges for practitioners of hospital pharmacy and their national professional organization. Practitioners must use their influence to provide better remuneration and they must strive to make hospital practice more attractive professionally. More of them must assume the professional obligation and responsibility of establishing high caliber residency training programs in hospital pharmacy to meet future manpower needs. These efforts must be culminated in active recruitment programs spearheaded by the national professional organization, but made effective by the united effort of its members.

4.4 Providing Services of Pharmacists

Seven recommendations relate to questions involved in getting pharmacists into hospitals to give professional service. First, we have recommended that hospitals be encouraged to implement the principle that pharmacy service be under the direction of a professionally competent, legally qualified pharmacist. This is one of the principles of the *Minimum Standard for Pharmacies in Hospitals*. Accordingly, pharmacy service may be directed by a pharmacist on either a full-time or a part-time basis. The pharmacist serving the hospital may be a community practitioner who comes to the hospital only a few hours a week. The important point is that he should be placed in charge of the pharmacy and should accept responsibility for the methods used to handle drugs.

As will be noted in Chapter V, the great majority of short-term general hospitals with 100 beds or more do employ a pharmacist. A number, however, do not and these, together with the many hospitals with less than 100 beds as well as a large majority of long-term hospitals, should be encouraged to have available the professional services of a pharmacist. The distribution of pharmacists throughout the country is such that numerous methods may be selected to accomplish this.

Our study shows that about 1 in 4 short-term hospitals with 50–99 beds and about 1 in 3 long-term hospitals employ a pharmacist. How do these hospitals employing a pharmacist differ from those which do not? To answer this question and to determine the possibilities of bringing pharmacy service to additional hospitals we are recommending that a study be made of the characteristics of these hospitals, with and without a pharmacist, to see how they differ and to study their methods of handling drugs.

Another method of bringing pharmacy service to hospitals is through the establishment of a coordinated service between a base hospital staffed with pharmacists and other hospitals lacking the services of a pharmacist. These satellite hospitals would require, of course, the services of a pharmacist for various amounts of time, depending upon their needs. Presumably, the director of pharmacy service at the base hospital could assume responsibility for the service in one or several small hospitals. He could assign a member of his staff to go to one or more hospitals a certain number of hours daily or weekly, according to the needs of each hospital. Detailed programs for the extent of service to be furnished each hospital could be worked out. These could encompass essentially all elements of pharmacy service, with the base hospital serving as a center for emergency service or drug information, for example. The hospital receiving the service could be billed on a monthly basis for services and commodities. Many possibilities exist for the development of these satellite pharmacies. A demonstration project is recommended.

When one considers the large number of hospitals without pharmacy service and adds to these nursing homes and other institutions in which drugs are handled rather extensively, it is evident that no one plan will meet all needs. The problem is so extensive and the need is so great that it is recommended that the American Society of Hospital Pharmacists consider the possibility of establishing consulting and training programs to enable pharmacists to provide a professional service to small hospitals and related health institutions according to their needs and to supervise the service thus rendered. This would, of course, be a vast undertaking if done on a nationwide basis, but one which could offer many advantages to patients, hospitals, and pharmacists.

A number of community pharmacists now offer their professional services to hospitals on a part-time basis. Some of the limitations of this service and the attitude of administrators toward it are discussed in Chapter X. The findings indicate that if community pharmacists are to play a more important role in offering service to hospitals, they must be prepared

to enter the hospital and give a personal professional service for at least a certain number of hours a week. Community pharmacists could be encouraged to play a much more important role than they now do in providing drug service in small hospitals.

Since community practitioners may be called upon to serve in hospitals, they should be oriented into the principles and concepts of hospital pharmacy practice. Orientation courses should be taught in colleges of pharmacy at the undergraduate level. The Society should sponsor lectures, institutes, seminars, and workshops for the benefit of those who have completed their formal studies but who wish to acquaint themselves with hospital practice.

Another study we are recommending is one dealing with the possibilities of greater utilization of nonprofessional personnel in the pharmacy. Demands for pharmacy service are increasing because of greater patient loads. Hospital pharmacists are seeking to broaden their scope of service, to improve its quality, to increase the hours it is available, and to assume additional responsibilities. All this requires additional personnel which means the expenditure of more money. On the other hand, skyrocketing costs are one of the greatest problems facing hospitals, and personnel represents about 70 percent of hospital costs. Thus, pharmacists, as have other professional groups such as medicine and nursing, must delegate some of their work to less skilled and less costly personnel in order to avoid aiding and abetting the escalation of hospital costs to the public.

There are many tasks which a pharmacist cannot delegate, and he cannot delegate his professional responsibility to see that the work is done properly. But many, many repetitive jobs, and those requiring supervision rather than pharmaceutical skill, can be delegated. Thus, as pharmacy service expands, the staffing pattern of hospitals should provide sufficient pharmacists to perform all professional acts which no one else can do, and to supervise all other work which can be safely and efficiently delegated to nonprofessionals. We believe that a study such as we are recommending would lead also to a better utilization of the professional skills of the pharmacist by relieving him of many tasks that could be done as well by other properly supervised personnel. It would thus give the pharmacist the opportunity to assume additional professional responsibility which only he can do. And it would tend to encourage the development of a broader scope of pharmacy service provided efficiently in terms of cost. This study would involve basic evaluation and analysis of functions performed in a hospital pharmacy department, those which must be done by a pharmacist, and those which can be delegated and the conditions under which such delegation can be made safely.

4.5 Remuneration

For the reasons noted in Chapter V, no salary data are being reported in this study. However, we believe the following general comments are in order even though they are not supported by published data. Traditionally, hospital pharmacy has paid lower salaries than has community pharmacy. Our findings of salaries paid in 1957 confirm that this was still true then. We believe, however, that a more recent survey would show that earnings of hospital pharmacists in 1963 are substantially higher and would compare more favorably with salaries paid to community pharmacists and to those in positions with managerial responsibilities. This is, of course, merely an opinion but it is based upon observation of events in the field and discussions with those in hospital pharmacy.

Salaries are determined to a great degree by the responsibilities of the pharmacist and by the competition for his services. Fortunately, two things are now happening. More and more hospital administrators are now seeking pharmacists with specialized training and/or education for appointment as directors of pharmacy service. There is, of course, a great shortage of trained hospital pharmacists and it will be some time before enough hospital pharmacy specialists are available to fill even the major posts.

Second, hospital pharmacists themselves are assuming more responsibility. Those who have received their training in hospital pharmacies offering a broad scope of service tend to duplicate these services in the hospitals to which they go. Hospital pharmacists who have been in practice for some years receive their stimulation for accepting more responsibility from attendance at refresher programs and institutes and by reading the literature of hospital pharmacy. These efforts are recognized and rewarded and must continue to be rewarded if hospital pharmacy is to be made an attractive career. Salaries paid to staff hospital pharmacists cannot be lower than those paid to community pharmacists and pharmaceutical detailmen if hospital pharmacy is to attract the better skilled pharmacists. Salaries paid to chief pharmacists must be commensurate with those paid to other pharmacists with managerial-professional responsibilities.

In order to provide information for encouraging pharmacists to seek their career in hospital pharmacy, we are recommending that salary data be obtained by the American Society of Hospital Pharmacists at least on a quinquennial basis. This could probably be done simultaneously with the census of hospital pharmacists. It should include, in addition to salary, the value of other personnel benefits such as retirement, health and other insurance, medical care, sabbatical leaves, and other fringe benefits.

5

RECOMMENDATIONS PERTAINING TO ADMINISTRATIVE SERVICES

Recommendations in this group involve the organizational line of responsibility of the chief pharmacist

and his degree of freedom, written policies, additional administrative duties, pharmacy records, and staff patterns and workloads.

5.1 The Recommendations

57 Organizational Line of Responsibility. It is recommended that the organizational line of responsibility of the chief pharmacist for the management of the pharmacy department lead directly to the administrator of the hospital or to one of his immediate professionally oriented assistants. (5.1)

58 Degree of Freedom. It is recommended that chief pharmacists take greater advantage of their degree of freedom and of the cooperative attitudes existing in hospitals to plan and present dynamic, progressive, and imaginative programs for the improvement of pharmacy service which will, at the same time, improve the attitude of the professional staffs toward the pharmacy. (5.2)

59 Written Policies. It is recommended that action be taken to encourage hospital pharmacists to develop and utilize written professional and administrative policies as management guides to aid in planning, developing, improving, and extending pharmacy service in hospitals. (6.1)

60 Additional Administrative Duties. It is recommended that the profession give particular encouragement to the assumption by hospital pharmacists of those additional administrative duties which bring into play their professional skills and knowledge of drugs and chemicals, and preparation and sterilization of related health supplies. (6.2)

61 Additional Administrative Duties and Scope of Service. It is recommended that a study be made of the effect assignment of additional administrative duties to the chief pharmacist has on the scope and quality of pharmaceutical service. (6.3)

62 Value of Records. It is recommended that hospital pharmacists be made more aware of the value and use of pharmacy records as management tools. (6.4)

63 Devise System of Records. It is recommended that a study group review the matter of pharmacy records, suggest the type of records which should be maintained to effect good management of the department, and devise a system of pharmacy records readily adaptable to hospital pharmacies of various sizes and types, giving particular emphasis to devising a system which is simple and may be maintained with a minimum of time and effort. (6.5)

64 Inventory Records. It is recommended that chief pharmacists have an inventory taken annually and that information in this inventory be utilized to guide purchases, recommend policies, calculate inventory turnover, return obsolete drugs, and so forth. (6.12)

65 Manufacturing Costs. It is recommended that a simplified procedure for determining the cost of products manufactured in hospital pharmacies be developed and that hospital pharmacists be encouraged to maintain such records. (7.12)

66 Expenditure per Patient Day. It is recommended that hospital pharmacists calculate the expenditure for drugs for inpatients per patient day and for outpatients per clinic visit, these records to be established in such a manner as to clearly differentiate these two expenditures and to permit comparisons among hospitals. It is further recommended that figures regarding expenditures for drugs from a representative sample of hospitals be collected and published annually. (6.9)

67 Effect of Hospital Formulary System. It is recommended that chief pharmacists evaluate the formulary system for its effect on expenditure for drugs and inform their medical and administrative staffs of their findings. (6.10)

68 Effect of Product Duplication. It is recommended that chief pharmacists study the effect of product duplication on inventory and inform their medical and administrative staffs of their findings. (6.11)

69 Bid Purchasing. It is recommended that hospital pharmacists study the value of bid purchasing, giving great emphasis to acceptable sources of supply and to rigid quality specifications. (6.8)

70 Review of Functions and Staffing Patterns. It is recommended that chief pharmacists review the qualitative and quantitative aspects of their departmental functions in relation to their staffing pattern for both professional and nonprofessional personnel, evaluate the extent to which the objectives of the pharmacy are being accomplished and recommend appropriate action based on an analysis of their findings. (6.14)

71 Pharmacy Workload Study. It is recommended that a study be made of hospital pharmacy workloads in relationship to scope of service and staffing patterns, including the number of professional and nonprofessional personnel. The objectives of such a study would be to suggest in broad terms the basic staffing pattern required for hospital pharmacies which provide certain services. (6.13)

5.2 Administrative Services

The chief pharmacist is a department head who is engaged by the hospital to manage, direct, and perform both professional and administrative services associated with the operation of the pharmacy. In the performance of his duties he is expected to coordinate the activities of the pharmacy with those of the other hospital departments and to work within the overall policies set forth by the governing body of the hospital and by its administrative officers. As the chief pharmacist, he is the hospital's authority in his special field of pharmacy and, more broadly, on all those matters related to drugs which do not involve acts reserved by law to physicians and nurses. In this capacity his administrative responsibilities are concerned with the proper operation of the pharmacy as one of the essential professional services of the hospital. Successful operation of this professional service involves utilization of the essentials of good management, namely, to plan, organize, direct, coordinate, and control.

The chief pharmacist has three directions in which he must extend his management or administrative lines of communications: upward to his administrative superior; downward to his pharmacy staff; and outward to other departments and groups and individuals including physicians, nurses, purchasing agents, and others.

As we will see in Chapter V, the pharmacist's organizational line of responsibility leads directly to the administrator or to one of his immediate assistants, with but few exceptions. He feels also that he has great freedom to operate and coordinate the pharmacy as he believes it should be operated. Thus, it would appear that the door is open for the large majority of hospital pharmacists to communicate with their administrative superior and to develop a program for the improvement of pharmacy service. Results of this survey show, however, that numerous deficiencies exist in both the professional and administrative aspects of pharmacy service in hospitals. With the degree of freedom and the organizational line of responsibility enjoyed by hospital pharmacists, it would appear that many of these deficiencies could be overcome or corrected through greater initiative and better planning on the part of chief pharmacists. The administrator is not the expert on pharmacy or pharmacy services. He has employed an expert to advise him, to develop plans, to establish a program, to seek improvements, to review progress, to analyze the hospital's needs, and to establish long-range as well as short-term goals. Persistent performance in these areas is, we believe, one of the greatest needs.

Basic to good planning is a careful review of the specific objectives and functions of the pharmacy service. From a consideration of these will flow the data required to plan the facilities, space, and equipment needed to carry out these functions. A quantitative estimation of the workload involved in each function will yield at least an approximation of the manpower needs. It is important for chief pharmacists to review periodically all aspects of their departmental functions, to evaluate which of their objectives are being fully met and to pick out those that demand more effort. This analysis can be done more effectively if workload figures are available for study. These include such basic information as the number of inpatient and outpatient prescriptions filled, the number of other requisitions processed, the number of items manufactured and prepackaged, and the various items which fall into the general category of non-measurable workloads as are discussed in Chapter VI. As we point out in that chapter, it appears that many hospital pharmacists have such a heavy prescription workload that little time is available for the numerous other professional functions expected of them. The volume of drugs handled in hospital pharmacies has increased enormously during the past several years and we suspect that more detailed studies would show the need for a more adequate pharmacy staff in many hospitals to meet the needs of patient service. Thus, we are recommending a broad study to relate scope of pharmacy service, staffing patterns, and workloads. Results of this study would serve as a guide to pharmacists in various size hospitals and should also provide interesting information relative to the influence of nonprofessional personnel on the scope of service pharmacists are able to provide.

Somewhat related to the need for planning is the need for written policies which are one of the administrative responsibilities of the hospital pharmacist. Results of this study show that 2 out of 3 chief pharmacists perform poorly in preparing written policies and procedures to guide the operation of the pharmacy service. Greater use of these important management tools would not only improve operations within the pharmacy but would also help to achieve better understanding and communications with all to whom the pharmacy provides service. Particularly important are the written policies and procedures developed by the pharmacy and therapeutics committee in association with the chief pharmacist. Failure to have well-defined and well-understood and accepted written policies relative to the handling of drugs has important professional, social, and legal implications, as is pointed out in Chapter VI.

Assignment of additional administrative duties to hospital pharmacists has important implications. We are now referring to those pharmacists who remain as chief pharmacists, not to those who accept full-time hospital administrative posts outside of the pharmacy. Our study has shown that a highly significant proportion of pharmacists in hospitals with less than 200 beds have additional administrative roles. Even in hospitals with more than 200 beds, about 1 in 4 pharmacists is utilized in an administrative position. Can this practice be expanded so that far greater numbers of hospitals with less than 100 beds can have the services of a pharmacist? If it can, great implications for patient service as well as manpower needs for the profession are evident. There is an additional consideration which should be explored. This is the effect assignment of additional administrative duties to the pharmacist has on his earning potential. In all walks of life, those with management ability are sought after and rewarded well. What are the potentialities of pharmacists assuming additional administrative duties? What effect will this have on his earning capacity? How will it affect the professional services of the pharmacy, and its staffing pattern?

5.3 Hospital Pharmacy Records

Record systems in hospital pharmacy require great improvement. This is true of records related to both the administrative and professional aspects of hospital pharmacy. For example, some orderly accounting should be made of the departmental workload, and control records should be maintained which identify particular batches of drugs during each stage of their manufacture or distribution in the hospital.

For one reason or another, hospital pharmacists do not feel strongly about the keeping of records and tend to limit their activities to those records dealing with procurement and those proscribed by statute, as narcotic records. This practice places many limitations on the planning and management functions of the chief pharmacist. He lacks facts and figures which are as important implements of good management as spatulas and graduates are to good pharmacy practice. For example, methods of determining costs of products manufactured in hospital pharmacy are so varied and yield such completely different figures as to be almost meaningless. Again, collecting data on the expenditure for drugs per patient day has not only important uses for management within the hospital, but also, if data is collected on a national basis with good sampling, the findings would have important social and economic significance.

We believe it will prove helpful if a study group reviews the matter of pharmacy records and devises a system which can be made readily available and is relatively simple to keep. Equally important are programs to show hospital pharmacists the value and use of pharmacy records as management tools.

5.4 Procurement of Drugs

In Chapter VI we note that both the expenditure and inventory of drugs are lower in hospitals employing the formulary system. The majority of hospitals using the formulary system also use bid purchasing *all to most of the time.* There is, thus, a direct relationship between bid purchasing and the formulary system. Hospital pharmacists are advised to study these relationships within their own hospitals and call their findings to the attention of the medical and administrative staffs.

5.5 Pharmacy Workloads

In Chapter VI we make a very gross approximation of workloads in hospital pharmacies based on the number of prescriptions dispensed. Results indicate that pharmacists in all hospitals except those with 500 beds and over have little time remaining to devote to the numerous pharmacy functions beyond those of dispensing. These findings, despite their limitations and approximations, indicate the need for a study of the staffing patterns of hospital pharmacies, including professional and nonprofessional personnel. We are recommending that chief pharmacists undertake such a study of their own departments. A more comprehensive national study should be made of hospital pharmacy workloads in relationship to the scope of service and staffing patterns for professional and nonprofessional personnel. The sample should include pharmacies of various sizes and types. A uniform system of records should be developed and used to determine the measurable workload, and a system of recording non-measurable workloads should be devised.

6

RECOMMENDATIONS PERTAINING TO ROLE OF PROFESSIONAL SOCIETIES

This group of recommendations deals with the education and training of hospital pharmacists. These subjects are discussed in Chapter IX, and certain aspects of them have been referred to briefly in the discussions of the research role of the hospital pharmacist and again in the discussions of his teaching role.

6.1 The Recommendations

72 Six-Year Professional Curriculum. It is recommended that colleges of pharmacy, in which the Master of Science degree requires neither a language nor a thesis and is not a research degree, be encouraged to offer a unified six-year program for hospital pharmacy, for which the professional degree of Doctor of Pharmacy would be appropriate. (9.1)

73 Doctor of Philosophy Degree. It is recommended that selected hospital pharmacists be encouraged to obtain a Doctor of Philosophy degree. (9.2)

74 Undergraduate Courses. It is recommended that the colleges of pharmacy be encouraged to establish undergraduate courses in hospital pharmacy which will provide an orientation in hospital pharmacy for those who enter the field without further training, and for future community practitioners who may be called upon to provide service to a small hospital or nursing home. (9.3)

75 New Concepts in Hospital Pharmacy Instruction. It is recommended that the American Society of Hospital Pharmacists study (1) the feasibility of fostering the establishment of a specialized school of hospital pharmacy as an integral part of a major university with a strong medical center, and (2) the means for testing the outer limits of serviceability to the needs of hospital pharmacy of the six-year professional curriculum and the Master of Science degree program in present schools of pharmacy, on the basis of a specialization expressed through special facilities, a separate hospital pharmacy curriculum, and the establishment of full chairs of hospital pharmacy, and

It is further recommended that the American Association of Colleges of Pharmacy and the American Council on Pharmaceutical Education be invited to name representatives to participate as members of this study group. (9.4)

76 Broadening the Pharmacology Education of Future Pharmacists. It is recommended that colleges of pharmacy be encouraged to utilize the facilities and the opportunities which exist in today's hospitals in the teaching of pharmacology so that students may gain firsthand experience in the action of drugs on patients and develop their skills as drug consultants. (9.5)

77 Clinical Professional Practice. It is recommended that colleges of pharmacy be encouraged to utilize the facilities of the hospital pharmacy to expand their "dis-

pensing" courses to a broader course encompassing clinical professional practice. (9.6)

78 Residency Accreditation. It is recommended that the accreditation program of the American Society of Hospital Pharmacists be used to stimulate improvement in hospital pharmacy residency programs, and that selected programs be encouraged to offer training in central sterile supply, radiopharmaceuticals and other special areas of practice. (9.7)

79 Specialized Training. It is recommended that opportunities for additional on-the-job specialized training be made available to encourage hospital pharmacists to broaden the scope of their professional services. (7.2)

80 Independent Residencies. It is recommended that hospital pharmacists not associated with colleges of pharmacy be made more aware of their professional responsibility to train future practitioners through well-organized residency programs and be encouraged to offer such training. (9.9)

81 Seminars for Directors of Residency Programs. It is recommended that the American Society of Hospital Pharmacists sponsor seminars for directors of hospital pharmacy residency programs at least every two years for the next ten years and as often thereafter as required. (9.8)

82 Institutes on Hospital Pharmacy. It is recommended that the American Society of Hospital Pharmacists increase the scope and depth of the institutes on hospital pharmacy and consider holding (1) two scientific and professional institutes, (2) two professional and administrative institutes, and (3) two specialized institutes annually. (9.10)

83 Programs for Community Practitioners. It is recommended that the American Society of Hospital Pharmacists sponsor lectures, institutes, seminars, and workshops for the benefit of community pharmacists providing pharmacy service to small hospitals and nursing homes. (10.6)

84 Fellowship. It is recommended that there be established within the Society a type of membership to be known as a Fellow of the American Society of Hospital Pharmacists. (5.12)

85 Membership Campaigns. It is recommended that the American Pharmaceutical Association and the American Society of Hospital Pharmacists carry out coordinated sustained membership campaigns to enlist the support of all hospital pharmacists to help achieve the goals toward which they are striving. (5.13)

6.2 Education

Today, most career hospital pharmacists prepare for specialization by taking a Master of Science degree and a residency in hospital pharmacy. A few of them continue their studies and obtain a Doctor of Philosophy degree. A Master of Science degree is basically a terminal professional degree at some schools; it is a research degree at others. While some schools require a language and a thesis for the degree, others do not. In those colleges of pharmacy offering a Master of Science degree without the requirements of a thesis or a language, it would seem more appropriate to offer a six-year professional program leading to the professional degree of Doctor of Pharmacy. This is recommended.

There is an increasing need for a number of hospital pharmacists with education at the Doctor of Philosophy level. This is true particularly in teaching hospitals where the need and opportunities for research are great. More hospital pharmacists should be encouraged to enter the Doctor of Philosophy program. So as not to unduly prolong the time required, plans should be developed so that the student may serve his residency in hospital pharmacy at convenient times during his course work, for example, during summers.

Colleges of pharmacy should be encouraged to establish undergraduate courses in hospital pharmacy. These would provide an orientation into hospital pharmacy practice for those students who enter the field without additional educational background. They would also be helpful to those who enter community practice and later offer pharmacy service to small hospitals or to nursing homes. An increasing number of opportunities for pharmacy practice in hospitals will exist in the future and students should be prepared for them.

Colleges of pharmacy should be encouraged to utilize the facilities of the hospital pharmacy to expand their dispensing courses to a broader course encompassing clinical professional practice along the lines suggested in Chapter IX. Advantage, too, should be taken of the facilities and opportunities which exist in the hospital to give the pharmacy student firsthand knowledge of the action of drugs on patients and thus to help develop his skill as a drug consultant.

Feasibility of establishing a specialized school of hospital pharmacy at a major university with a large and important medical center should be investigated. The advantages of such a step have been outlined elsewhere.* Meanwhile, means of utilizing fully the six-year professional curriculum and the Master of Science programs in present colleges of pharmacy should be investigated. Consideration should also be given to the establishment of full professorships in hospital pharmacy. These would be similar in nature to the full professorships held by physicians and dentists in medical and dental schools.

6.3 Training

Results of this study show that hospital pharmacists who have received their training in hospital pharmacies feel somewhat less prepared for hospital practice

* Francke, D. E.: An American School of Hospital Pharmacy, *Am. J. Hosp. Pharm. 16*:53 (Feb.) 1959.

than those who received their training in community pharmacies (Chapter IX). These findings show the need to review and improve all aspects of residency programs. The American Society of Hospital Pharmacists has now undertaken the accreditation of programs for the training of career hospital pharmacists. This should provide the needed stimulation for the improvement of residency programs. Selected programs should be encouraged to offer training in the operation of central sterile supply, in the handling of radiopharmaceuticals and in other areas in which the professional background of the pharmacist is utilized. Whether the time required for this training should be in addition to the basic 2000 hours would depend upon the extent of training offered. An orientation program could be included as a part of the total program; however, more intensive training of, say, a month or two, should require additional time beyond the basic 2000 hours.

Selected hospitals should also be encouraged to offer additional opportunities for specialized training for those who are now in practice. Many hospital pharmacists, for example, want to undertake a properly controlled sterile manufacturing program, or a general manufacturing program, or a control program, or have been asked to assume responsibility for central sterile supply, or for furnishing radiopharmaceuticals. They should be encouraged in these endeavors, and specialized training in these areas should be available which could be obtained, say in a month's time.

Well-motivated hospital pharmacists not associated with colleges of pharmacy should be encouraged to offer residency programs in hospital pharmacy. There is great need for more strong, independent residency programs to train those who wish to enter hospital pharmacy without an advanced degree. Then, too, there will come a time when there will not be enough posts in the residency programs at university hospitals to accommodate all students. The existence of strong, accredited residency programs at other hospitals will make it possible to provide training for additional students.

Good training programs in hospital pharmacy are essential to ensure a supply of properly qualified pharmacists to serve patients in the nation's hospitals. There is no other way for them to obtain this training. The presence of residents in a pharmacy serves to stimulate and upgrade the quality of service provided. Hospital pharmacy residency programs are an investment for developing pharmaceutical service in hospitals.

This entire area of residency training is so important and so vital to the future of the profession, of hospitals, and of the public, that we are recommending that the American Society of Hospital Pharmacists sponsor seminars for directors of these programs at least every two years for the next ten years. Directors of residency programs occupy positions highly important for the future of the profession. They should be brought together often so as to engage in an exchange of ideas, to explore new concepts and developments in hospital practice, to determine methods of improving their training programs, and to receive that personal stimulation that is so essential for continued progress.

6.4 Institutes and Seminars

Keeping up-to-date with the developments in his field is always a problem for the busy practitioner. His needs are often overlooked in the educational process. New developments and concepts are constantly emerging, so that the practitioner who has been graduated five years is lost without a program which will bring him up-to-date and stimulate his thinking. Hospital pharmacists are fortunate in that they have had, arranged for them, since 1946, annual refresher programs or institutes on hospital pharmacy. Findings of this study show that those who attend these programs more than once find them of increasing value.

The scope and depth of these refresher programs need to be constantly expanded, to meet the needs of those who attend for the second, third, or fourth time. Those who attend for the first time may be challenged a bit more, but as they return again and again they too will find the programs valuable. Three topics of programs are suggested: scientific and professional; professional and administrative; and specialized institutes. Professional subjects would be common to the first two for these form the core of the practice of hospital pharmacy. Then, scientific subjects would make up the balance of the program for one institute, while administrative topics would be discussed at the other. Finally, the specialized institutes could be used to develop a professional, scientific, or administrative subject to some depth, for example, the assay and control of pharmaceuticals, the preparation of parenteral solutions, or the management problems involved in pharmacy workload studies.

Community practitioners interested in offering pharmacy service to small hospitals need indoctrination into hospital pharmacy concepts and practices. This subject is discussed extensively in Chapter X. The American Society of Hospital Pharmacists should sponsor lectures, institutes, seminars, and workshops for the benefit of this group.

The institutes on hospital pharmacy represent an outstanding contribution to the education of hospital pharmacy practitioners by the American Society of Hospital Pharmacists. Efforts should be made to keep them dynamically progressive.

6.5 Fellowship

The term Fellow usually refers to a type of membership in an organization which is granted to an individual who, through advanced study or training or a series of outstanding professional accomplishments, has made himself eligible to be so designated.

The objectives of establishing the category of fellow are to encourage members of a profession (1) to prepare themselves by additional study and training to render better service to the patient, (2) to raise the standards of practice of the profession, (3) to contribute to its literature, (4) to participate in the training of future practitioners, (5) to foster investigations and research, and (6) to become the type of professional individual who reflects credit upon his profession and stimulates others to emulate his good works.

If the term fellow is to be meaningful, it will be necessary for the American Society of Hospital Pharmacists to establish rather rigid requirements which must be met before a hospital pharmacist may be accepted as a fellow. On the other hand, it is recognized that advanced education and training do not, in themselves, always mean that the individual possessing them is a superior practitioner—they mean only that he has greater opportunity to be. Numerous examples could be cited of practitioners whose advanced training and education have been in the schools of experience and self-study financed from tuition paid by initiative, curiosity, professional pride, a desire to give service, and an eagerness to learn. Therefore, each active member of the Society should be eligible to apply for fellowship, the only basic requirement being that he be a licensed pharmacist. However, eligibility to make application and eligibility to be designated a fellow must be two separate and distinct entities.

Consideration should be given to several requirements along the following lines. First, the applicant for fellowship would have to show that he is operating or is employed in a pharmacy department which complies in all respects with the *Minimum Standard for Pharmacies in Hospitals*. This would have to be established, probably by an inspection, before any further steps toward a fellowship could be taken. Next would be submission by the candidate of evidence showing his contributions to the literature of hospital pharmacy, his attendance and participation in Institutes on Hospital Pharmacy and other refresher programs, his participation in the training of future practitioners through residency programs, his activities in local or national hospital pharmacy organizations, his investigations or research, or other special activities which demonstrate his interest in and contributions to the practice of hospital pharmacy and the advancement of his profession. Following this may be a series of oral or written examinations which the candidate would have to pass before being accepted as a fellow. Undoubtedly, the requirements would be flexible to a degree; that is, if a candidate did not participate in the training of hospital pharmacy residents, other professional accomplishments could be substituted. Still, the overall requirements must be maintained at a high level if the fellowship is to be meaningful.

Some group, such as a board or committee must be established to review the qualifications of the applicant, to make inspections of pharmacy departments, and to prepare and give the examinations. It will not be an easy matter to select the members of the board of review; nor will service on the board be without its difficult moments. Board members, in fact, may anticipate a difficult and, often, a thankless job with impatient or disappointed candidates chafing because of delay or charging bias because of their failure to meet requirements. But the road to a fellowship should not be too easy to traverse and it may require some years for candidates to fulfill the requirements and be accepted as Fellows of the American Society of Hospital Pharmacists.

Financing such a fellowship program will be a problem. The Society will have to establish a separate, additional dues structure to carry out its fellowship program, with fees for application and examinations and with annual dues to expand the fellowship program. In fact, the costs of operating the program will be such that the Society will have to invest money in the project during the first few years and it will require several years and the annual dues from several hundred fellows before the program will be self-supporting.

The Society's fellowship program should provide a stimulus and a challenge for hospital pharmacists to raise the standards of professional service and to make hospital pharmacy an even better specialty in which to practice.

PART II

II

Goals for hospital pharmacy

1

INTRODUCTION

You have read the recommendations based on this study. However, something essential is missing. Most of the recommendations could be carried out and hospital pharmacy would remain much the same. For we must change something more basic than bricks and stones, policies and procedures, figures and forms. We must change ourselves and our concepts of the practice of pharmacy. Motivation is the well-spring of action. Motivation and performance are precursors to progress. To begin, we must agree on long-range goals for hospital pharmacy in America. These goals must be based on a philosophy of service.

1.1 Commitment of the Individual

After devoting several years to the study of pharmacy as a profession, Elliott concluded:

> After all has been said and done, it may be concluded that the outstanding factor determining the future of the profession of pharmacy is fundamentally moral in nature. The profession must contain a far greater proportion of members who are ever sharply jealous of the high reputation of the profession and who, by energetic cooperation, are determined ever to protect that reputation.[1]

This leads away from the recommendations toward the truth that progress in hospital pharmacy is more dependent upon a commitment of the individual than it is upon superficial changes in his facilities or education or training. This has been the experience of American hospital pharmacy during the past several decades.

Although the existence of the American hospital covers a span of more than two hundred years, it has been only during the past three decades or so that we have witnessed a rapid expansion of our present vast and complex hospital system. While comparatively few hospitals existed prior to 1900, so were there few pharmacists practicing in the hospital. While the number of hospitals increased, so did the number of hospital pharmacists. Hospitals were not well organized, nor were hospital pharmacists. As the movement toward the organization, expansion, and growth of the hospital system in the United States began to take shape, so also was there a movement toward the organization of hospital pharmacists. As Berman points out, the critical years for hospital pharmacy were the two decades from 1920 to 1940.[2] The "Awakening in the Twenties" came about as a result of hospital pharmacists' growing realization of the problems, potentialities, and importance of their specialty. The "Advances in the Thirties" resulted from their determination for organization, recognition, and higher standards of practice.

The activities of the hospital pharmacists during these two critical decades resulted in the formation of the American Society of Hospital Pharmacists in 1942. It has been stated that formation of the American Society of Hospital Pharmacists was one of the outstanding achievements in the history of American pharmacy. This statement is misleading. In itself, formation of the Society was just another accomplishment—another organization.

1.2 Interest versus Purpose

It was the adoption of a philosophy of service by those hospital pharmacists during the twenties and thirties which made the formation of the American Society of Hospital Pharmacists a significant achievement. This "philosophy," if it may be called that, is not really a new concept of pharmacy service. It is a concept as old as the profession itself but which seemed to have been forgotten. These hospital pharmacists focused their attention on pointing up the difference between *interest* and *purpose*. Although there are many meanings of interest and purpose, the following quotations serve to illustrate what we have in mind: First,

> No enterprise can exist for itself alone. It ministers to some great need, it performs some great service,

not for itself, but for others; or failing therein, it ceases to be profitable and ceases to exist.—Calvin Coolidge.

And second,

Interest does not bind men together. Interest separates men. Only purpose can unite men.—Woodrow Wilson.

Hospital pharmacists returned to the basic purpose for the existence of pharmacy as their primary objective. The purpose for the existence of pharmacy can be described in many ways, but essentially it is to provide pharmaceutical services as an integral part of the total patient care concept in the interest, safety, and welfare of the public health. This is the philosophy of service which was referred to earlier. This is the philosophy that was infused into the minds of the pharmacists entering hospital practice.

It formed the basis for the primary objective of the American Society of Hospital Pharmacists which has pioneered the development of an elite corps of properly oriented hospital pharmacists who are determined to live up to this philosophy. They realize that this is the only basis for the existence of pharmacy as a profession. It is because of this prime motivating force that we have realized tremendous progress in hospital pharmacy during the past two decades.

2

THE PROFESSION AS A WHOLE

Speaking about interest and purpose, one cannot help thinking not only about hospital pharmacy, but the profession as a whole. In the days when medicine was mostly an art with very little science, so also was pharmacy. Now medicine has developed more and more on the scientific side, so also has pharmacy. While the scientific developments in medicine were incorporated into the practice of medicine, the scientific developments in pharmacy were incorporated into the pharmaceutical industry and not into the practice of pharmacy *per se*. While medicine has continually increased its services, professionally and scientifically, pharmacy has not increased its professional services to the public nor its scientific services to the physician. Instead, pharmacy expanded its efforts into a wide array of activities—commercial activities which have nothing to do with the basic purpose of pharmacy's existence. Justified or not, the American drug store is an international joke. Within this environment our five- and six-year graduates strive to practice their profession. It is a difficult task.

2.1 Pharmacy's Purpose for Existence

It seems that pharmacy's purpose for existence has been pushed back into a position of secondary significance and that personal interests have become the primary objective. In other words, many pharmacists have fused and confused our purpose with interest.

We have reached the point where pharmacy is not maintaining public support even in areas where support is essential in the interest of public health and safety. For example, take just a few of the problems pharmacy has been trying to solve during recent years:

- —the dangerous aspects of the distribution of certain non-legend drugs.
- —lowered requirements for licensure as pharmacists.
- —mail-order prescription schemes.
- —dispensing of drugs by unqualified persons.
- —counterfeit and inferior drug manufacturers.
- —funneling of prescription drugs such as barbiturates and amphetamines to non-pharmacy outlets, such as truck stops.

Is pharmacy getting the public support it should with regard to the distribution of non-legend drugs in outlets other than pharmacies? Is pharmacy getting adequate public support in preventing unqualified individuals from becoming registered pharmacists in some states? Is pharmacy getting adequate public support in preventing the establishment of dangerous mail-order prescription operations? Is the public really concerned about preventing unsafe drug dispensing practices by persons other than registered pharmacists? Indeed, are many pharmacists themselves lending their support to eliminate these public health hazards?

It is questionable whether the public is giving adequate support, and there is no question that many pharmacists are giving no support, to eliminate these practices which are dangerous to the public health.

Why isn't the public lending its full support? Could it be that the public has reached the point where it is not completely convinced that the services of a qualified pharmacist are essential? Could it be that the public is beginning to wonder whether the pharmacist is providing such an essential professional service? Or could it be that the public is becoming more cognizant than some seem to believe that the pharmacist has adopted an "interest first—purpose second" philosophy?

It has been stated by Dean Linwood Tice with convincing evidence that the public image of pharmacy is pretty much dependent upon the medical profession's image of pharmacy.[3] The more dependent the physician is on the pharmacist, the more dependent will the public be on the pharmacist. To put it in the negative, the less dependent the physician is on the pharmacist, the less dependent the public is on the pharmacist. Because pharmacy has not kept pace with medicine in increasing its professional services to the public nor its scientific services to the physician, the slow, yet progressive trend over the years has not been an increase in the dependence of the physician on the role of the pharmacist in the overall

patient-care concept. Thus the survival of the role of the pharmacist as a professional hangs at the edge of a precipice. In terms of the future, how are we to meet the challenge of reversing this trend which has been in existence for so long that it can hardly be termed a trend?

It is conceivable that the solution to this dilemma might be achieved in a number of different ways. Whatever the solution may be, it should be a logical and practical one. We submit, therefore, that the survival of pharmacy as a profession rests to a major degree with hospital pharmacy.

2.2 Role of Hospital Pharmacy in the Profession

Consider if you will that every future practitioner of medicine in the United States must obtain a substantial portion of his professional training in the hospital. This training begins during the clinical years of the student's educational career as a junior in medical school. This is where he begins to relate his basic biological science background to clinical practice. This is his first professional contact with the profession of pharmacy and this contact is the hospital. The medical student continues through his junior and senior years in medical school, as an intern in the hospital, and anywhere from one to five more years in a residency program. Thus, during the first three to eight years of his professional career, each future practitioner of medicine has his sole professional contact with pharmacy through the hospital pharmacist where he is taking his training. Thus, the way in which he is able to utilize the services of the pharmacist in his medical practice, the extent to which he develops a dependence on the pharmacist and the image he perceives of the pharmacist as a professional practitioner, will determine to a major degree this physician's dependence or lack of dependence on the relationship between pharmacy and medicine during his entire professional career.

It is quite evident, therefore, that in the hospital pharmacist's hands lies the future image of pharmacy in the minds of all the future practitioners of medicine. And if it is true that the more dependent the physician is on the pharmacist the more dependent will the public be on the pharmacist, then there is a direct relationship between how the hospital pharmacist practices his profession and how dependent the public will be on pharmacy.

Further, if during his formative years as a physician-in-training, the young physician develops an increasing need for the services of the pharmacist, then he will demand this same type of professional service when he enters private practice. Thus the community pharmacist who expects the support of this type of physician will have to expand his concept of what he considers professional pharmacy. In other words, community pharmacy practitioners will be expected to provide the same level of professional services to this physician as he has been accustomed to from the hospital pharmacist. If he doesn't, he will not survive, at least as a practitioner.

This can only come about when all of hospital pharmacy practice has been developed to the point where the physician, no matter in what hospital he obtains his training, will gain a favorable professional image and develop a dependence on pharmacy in his medical practice.

We have still a long way to go in hospital pharmacy to accomplish this. However, during the past two decades or so, hospital pharmacy has emerged with a sound philosophy of professional practice, is developing an enthusiastic corps of dedicated practitioners, and has made a comprehensive study of its present professional posture through the Audit of Pharmaceutical Service in Hospitals. We are quite well aware of our weaknesses as well as our strengths. We are making a concerted effort to eliminate the undesirable practices, to improve the good ones, and to polish the excellent within the framework of the basic purpose for which pharmacy exists—the patient first.

The strategic position which hospital pharmacy holds in the relationship between pharmacy and all the future practitioners of medicine is one of the major determining factors to the future survival of pharmacy as a profession. Through the development of excellent pharmaceutical service in all the hospital pharmacies in the United States, the professional posture of pharmacy can be improved. It is a logical and practical solution to the problem of professional survival.

It would be naive, however, for hospital pharmacists to think that they can accomplish such a goal by themselves. There is a need for all the segments of the profession to lend their support to the development of high quality pharmaceutical practices in hospitals. In addition, it is essential that they return to the philosophy of purpose over interest. Boards, colleges, industry, organizations, and particularly community practice, need to reevaluate their primary objective for existence.

2.3 Boards of Pharmacy

The purpose of a board of pharmacy is to do everything within its scope and power to protect the public within the broad sphere of pharmacy. Unquestionably, many board members have carried out this responsibility. On the other hand, there is no doubt that some members have promulgated the special interests of pharmacy more diligently than they have promulgated the avowed purpose of the board. By promulgate we mean not necessarily through acts of commission but also through acts of omission, that is, by their inaction in letting various detrimental practices develop, continue, and expand. Thus, an important aspect of the survival of pharmacy as a profession lies to a degree on the proper motivation of board members in the discharge of their public duties entrusted to them by the public.

2.4 Colleges of Pharmacy

If there are any neutral segments of the profession, educators are probably on top of the list. They have pursued special interests but these have been toward promoting their colleges in order to obtain a larger number and higher caliber of students because they are in a competitive market. Their goal or purpose (to reduce it to simple terms) is to provide well-trained graduates to pursue a meaningful and responsible career to promote the public health through pharmacy. Their interests are directed toward this goal. That they are trying to fulfill their goal is unquestioned. That they are providing this type of graduate, however, is questioned by many. Let us explore this point further. If colleges are not graduating the type of pharmacist we as practitioners would like to have, then what are some of the underlying causes?

Colleges of pharmacy can only attract a level of student as high or as low as the image, the challenge, the prestige, the contribution, the satisfaction that pharmacy as an occupation imbues in the public mind —indeed in the mind of the young high school scholar who is looking forward to higher education and who is exploring the vast opportunities available to him in deciding his future place in the sun. Pharmacy, as a vocational pursuit, rests with his image of that phase of pharmacy with which he is most familiar—community pharmacy. Until community pharmacy as it is so often practiced today improves its professional posture, it will continue to be difficult to attract students of a high caliber and professional motivation into our colleges of pharmacy. Thus, a major challenge to professional survival rests with the responsibility of the many outstanding community practitioners to help elevate the standards of practice in the less desirable pharmacies, or to assist in their demise.

2.5 Pharmaceutical Industry

While not strictly a part of the profession, the pharmaceutical industry and pharmacy have a mutual relationship with each other, much in the same manner that medicine and the pharmaceutical industry are related. The purpose of the pharmaceutical industry is to provide the best drugs available to help cure and alleviate the sick and injured. Unquestionably, it has done much to fulfill its responsibilities within this context. Because it must be concerned with the stockholder's desires, industry has had to engage in special interests also. The competitive nature of our free enterprise system has placed significant pressure on the ethical pharmaceutical industry to bring into sharper focus the fulfillment of these special interests. It has been pursued to the point, however, where many believe that these special interests have a foot in the door, so-to-speak, and the question is being raised as to whether the pharmaceutical industry's prime objective is interest over purpose. As long as industry maintains purpose (within the context of improving the public health) as its primary objective over and above interest (within the stockholder's economic desires), it shall then be in a most favorable position in maintaining its autonomy from complete governmental control. If, on the other hand, interest continues to make headway over purpose, as some have a tendency to think the trend is going, then this vital segment of public health as a free enterprise industry will have a most difficult challenge in the years ahead in maintaining its independence.

2.6 Pharmaceutical Organizations

Some pharmaceutical organizations have done much to assist in elevating standards of practice and to emphasize in pharmacists' minds the basic philosophy of purpose over interest. Unfortunately, organizations with such an altruistic objective have received little support from practitioners. On the other hand, many pharmaceutical organizations have the avowed purpose of promoting the economic interest of pharmacists as their primary objective. This presents a most serious threat to the survival of pharmacy as a profession.

Thus, another major challenge to professional survival is for all practitioners to support our national professional organization—the American Pharmaceutical Association—and to reevalute the objectives of many state and local associations in order to bring about an improvement in their philosophy toward the basic purpose for the existence of pharmacy.

Thus far, American pharmacy has not found it possible to unite, to become well organized, or to establish well-defined goals. In the meantime, strong social, economic, technologic, and scientific forces continue to confront our profession at an accelerated pace. Decisions affecting pharmacy are made by governmental units at all levels. Local, state, and federal governments furnish an increasing proportion of medical care to large segments of our population, directly or indirectly. Medical care for the aged appears to be just over the horizon. Blue Cross and private hospitalization insurance plans continue to expand benefits, some with programs to cover outpatient care, including drugs. Labor unions and consumer organizations are setting up pharmacies to supply drugs to members, directly and by mail. Industrial plants furnish drugs as a fringe benefit. Chain drug stores continue to use pharmacy as an excuse to merchandise a wide gamut of goods to the detriment of our professional practice and image. Pharmacy's industrial revolution has fundamentally altered the role of the practicing pharmacist. And while these and other forces consume the profession, pharmacy's practitioners go their merry way—blithely hoping that something, someday, some way, will happen to lead them out of the morass, lead them toward the promised land. All the while we remain engulfed by our petty problems resolving to be irres-

olute, deciding to be indecisive, while the great, the really fundamental and important, issues are decided by others for us. When shall we begin to shape our own destiny? John Stuart Mill once said:

> History shows that great economic and social forces flow like a tide over communities only half conscious of that which is befalling them. Wise statesmen foresee what time is thus bringing and try to shape institutions and mold men's thoughts and purposes in accordance with the change that is silently coming on.
>
> The unwise are those who bring nothing constructive to the process, and who greatly imperil the future of mankind, by leaving great questions to be fought out between ignorant change on one hand, and ignorant opposition to change on the other.

2.7 A Program for Action

Fortunately, however, the American Pharmaceutical Association has set forth a program for the unification of American pharmacy through a plan which calls for the formation of a federation whereby state and county associations would be federated with it into a strong, unified body. The American Society of Hospital Pharmacists early recognized this need for professional unity and was, in fact, founded as an affiliate of the American Pharmaceutical Association over twenty years ago, requiring that each of its members also hold membership in the American Pharmaceutical Association.

Despite the existence of a plan for the federation of American pharmacy, with its inherent program for developing a closely knit integrated county-state-national membership structure, the big question remains: Will American pharmacy, and particularly the state associations, become an integral part of it through direct affiliation? We dare not hope otherwise.

We must frankly recognize and readily admit that the American Pharmaceutical Association has worked against hopeless odds regardless of the splendid work and many contributions made since its founding in 1852. Its membership has always been too small, its financial support grossly inadequate, and its headquarters staff hopelessly undermanned. One may praise the American Pharmaceutical Association for the work it has done, but at the same time admit that it has never had the membership or the support required to be the truly effective national professional organization the profession requires for growth rather than survival. The American Pharmaceutical Association has worked with steadfastness of purpose, understanding and emphasizing the essential truths of pharmacy's professional role in society. But it has lacked "the active support and cooperation of each one who wants to live *in* a profession, and not merely live *off* it."[4]

American pharmacy now has the opportunity to rally around the American Pharmaceutical Association and to achieve a unity of purpose. Several states, and through them many counties, have now joined the federation. Hospital pharmacists must do whatever possible to encourage their state associations to unite with the American Pharmaceutical Association. "One who wishes to succeed in a profession must also wish to see that profession succeed."[5] The measure with which they are successful will decide whether American pharmacy's federation is a false hope or a bright future.

3

CHARACTERISTICS OF A PROFESSION

A profession can be characterized largely in terms of five basic criteria. These are: "(1) A relatively specific, socially necessary function upon the regular performance of which the practitioner depends for his livelihood and social status; (2) a special technique, competence in which is demanded, resting upon; (3) a body of knowledge embracing generalized principles, the mastery of which requires theoretic study; (4) a traditional and generally accepted ethic subordinating its adherents' immediate private interests to the most effective performance of the function; and (5) a formal association fostering the ethic and improvement of performance."[4]

Professions are never static. They are shifting constantly away from or toward the ideal of professionalism. This movement is produced by the total kinetic energy generated by the efforts the group makes to maintain or intensify the five essential professional forces or qualities. Thus, for lasting effects we must develop aspirations which thrust persistently toward all five essentials. We cannot, for example, develop three and ignore two of them; nor develop education and training and ignore others. To the extent we do, it becomes more difficult to hold hospital pharmacy in the vanguard of professional groups. Thus, a balanced development of each of the five criteria is essential if we are to move persistently toward our professional goals. This process will not be difficult once we agree on the principles involved and are convinced of their importance.

3.1 Hospital Pharmacists' Professional Ideal

Hospital pharmacists are in an especially good position to develop and carry out a program which will lead them steadily toward their professional ideal. They have essential public health functions to perform that yield their living and their status, and they have special technics based on a body of knowledge embracing general principles. Also, they serve in an environment that permits them to exercise a traditional ethic which subordinates their private interests to the most effective performance of their function.

And, finally, they have a fine professional organization that fosters the improvement of their service and their ethical standards. With these essential attributes at hand, we must develop a well-coordinated plan to benefit from their potential. But plans are not simply drawn and executed; they are evolved and carried to fruition by sustained and persevering enthusiasm and toil.[6]

3.2 Basic Truths

Let us then develop long-range goals for hospital pharmacy and in their accomplishment elevate the whole of American pharmacy. What do we want our professional practice to be? We cannot proceed far without accepting fundamental principles or basic truths. There may be others, but we propose the following:

1. A profession is an associative society whose members possess and pass on a special field of knowledge acquired by extensive study and practice.

2. The field of specialized knowledge of pharmacists is pharmacy itself; that is the science and art of those matters related to the procurement, preparation, control, and distribution of drugs, including the numerous elements that comprise these entities.

3. Possession of this knowledge and skill, and their use for the benefit of humanity are the prime bases for the existence of pharmacists.

4. Pharmacy will receive professional recognition from society only to the extent that its practitioners make use of their specialized scientific and professional knowledge.

5. True professional growth in hospital pharmacy will result only when the hospital pharmacist expands areas of practice which enable him to utilize the specialized professional and scientific knowledge and skills which are uniquely his.

6. The hospital environment provides opportunities in great measure for the pharmacist to utilize his unique knowledge and skills.

7. Education and training form the bedrock upon which hospital pharmacy must build in order to bring knowledge and experience to bear upon practice.

8. Professional advancement is fostered when a professional organization produces and makes widely available information and services which its members cannot provide for themselves.

9. Professional advancement is possible only when practitioners commit themselves to their professional ideals as the vital truths upon which their professional work on earth is made whole.

10. The purpose of a health profession is to serve the health needs of the people.

3.3 Goals for Hospital Pharmacy

We suggest that six broad goals be the focus of attention for hospital pharmacists during the next several decades. Coordinated plans must be drawn and implemented to:

1. Teach hospital pharmacists by word and precept the philosophy and ethics of hospital pharmacy as one of the healing arts and their personal, individual accountability to assume responsibility for professional practice.

2. Strengthen and expand the scientific and professional aspects of the practice of hospital pharmacy, including the consulting role of the hospital pharmacist, his teaching role, and his activities in the field of investigation and research.

3. Strengthen and perfect the administrative or management skills and tools essential to the hospital pharmacist in his role as a department head.

4. Attract a greater number of well-trained pharmacists to hospital practice, including those with specialized education and training in hospital pharmacy.

5. Promote payment of realistic salaries to hospital pharmacists in both staff and managerial positions in order to attract and retain the services of career personnel.

6. Utilize the resources of hospital pharmacy to assist in the development and improvement of the profession as a whole.

We suggest that the American Society of Hospital Pharmacists study these goals, make such modifications or additions and deletions as are desirable, and adopt by formal action appropriate goals for hospital pharmacy practice. Transforming these goals into reality will require the concerted efforts of all hospital pharmacists guided by inspired leadership under a carefully drawn plan vigorously executed. But history shows that groups which unite with a purpose, which give a selfless service for the greater good, which make plans and keep driving forward, which set immediate objectives yet maintain a degree of flexibility, which prepare themselves for the future—are those which make tremendous progress.

REFERENCES

1. Elliott, E. C.: *The General Report of the Pharmaceutical Survey 1946–49*, American Council on Pharmaceutical Education, 1950, pg. 4.

2. Niemeyer, G. F., Berman, A. and Francke, D. E.: Ten Years of the American Society of Hospital Pharmacists, *Bull. Am. Soc. Hosp. Pharm.* 9:287 (July-Aug.) 1952.

3. Tice, L. F.: "The Public Image of Pharmacy," presented at the Joint Seminar of The Indianapolis Branch of the American Pharmaceutical Association and The Indiana Chapter of the American Society of Hospital Pharmacists, January 28, 1961, Indianapolis, Ind.

4. Sonnedecker, Glenn: To Be or Not to Be—Professional, *Am. J. Pharm.* 133:243 (July) 1961.

5. Morey, L.: *The State Supported University*, University of Southern Illinois University Press, Carbondale, Ill., 1961.

6. Jenkins, G. L.: *Bull. Am. Soc. Hosp. Pharm.* 9:300 (July-Aug.) 1952.

PART III

III

Origins of the study

1

INTRODUCTION

Interest in a study in hospital pharmacy has been in the minds of its leaders for at least the past three decades. The need became increasingly apparent during the last ten years as the result of the great demands being made on hospital pharmacy practice, along with the dramatic changes in the total medical care picture. During this time, the national organizations, through the then established Division of Hospital Pharmacy of the American Pharmaceutical Association and the American Society of Hospital Pharmacists, had on numerous occasions expressed a need for data regarding the current status of pharmacy practice in hospitals. Further, the American Hospital Association, through its annual questionnaire to hospitals in the United States and Canada, had attempted to compile some information in this area. Such data were, however, limited and usually covered only the number of hospitals reporting employment of pharmacists according to bed size, type and by state, and hospitals reporting a pharmacy department. It was therefore anticipated that data supplied through a survey or audit, such as the Audit of Pharmaceutical Service in Hospitals, would serve as a guide in implementing a program designed to improve and extend service in the nation's hospitals.

Historically, it is conceivable that as early as the late thirties and early forties when the first *Minimum Standard for Pharmacies in Hospitals* was adopted and the American Society of Hospital Pharmacists was organized, some thought was being given to determining the status of pharmacy practice in hospitals in the United States. As early as 1945 when Dr. Don E. Francke served as Chairman of the American Society of Hospital Pharmacists, the following statement was made in his report to the membership:

> If hospital pharmacy is to progress, and if the status of the individual hospital pharmacist is to be elevated, the Society must be active in many directions . . .
>
> Hospital pharmacy is redoundent with fields in which the need for additional data and survey is great. There is need for competent surveys leading to specific recommendations on the physical size, arrangement, location and equipment of hospital pharmacies. There should be a reevaluation of the scholastic training offered students preparing for the practice of hospital pharmacy . . . .*

1.1 Early Proposals

During subsequent years, leaders in the Society and those concerned with the work of the Division of Hospital Pharmacy gave considerable thought to the possibility of a survey. During this period, the staff of the Division of Hospital Pharmacy worked closely with the U. S. Public Health Service's Division of Hospital Facilities, particularly with Mr. Alex Milne, a pharmacy specialist in the Division, in developing a proposed questionnaire. This questionnaire, based principally on the *Minimum Standard for Pharmacies in Hospitals*, was divided into the six sections covered in the Minimum Standard. These include Organization, Policies, Personnel, Facilities, Responsibilities, and Pharmacy and Therapeutics Committee. This questionnaire was submitted to the Policy Committee of the Division of Hospital Pharmacy for review at a meeting in November 1951. Numerous revisions were made and consideration was given to possible means of collecting the data.

In 1950 the American Pharmaceutical Association, through the Division of Hospital Pharmacy, made application for funds to carry out an audit or survey of pharmaceutical service in hospitals. This request was not granted at that time, however, since the Congress did not appropriate funds for the grants in a program as then proposed by the U. S. Public Health Service. A letter to Dr. Robert P. Fischelis from Dr. John W. Cronin, Medical Director, Chief,

* Francke, D. E.: Report of the Chairman, American Society of Hospital Pharmacists, *J. Am. Pharm. Assoc., Sci. Ed.* 34:365 (Dec.) 1945 and *Bull. Am. Soc. Hosp. Pharm.* 2:157 (Sept.-Oct.) 1945.

Division of Hospital and Medical Facilities, dated August 22, 1955, refers to the application submitted in 1950. (See Appendix D.)

Thinking continued in this area and other proposals for carrying out such a study were made. At a meeting of the Policy Committee of the Division of Hospital Pharmacy in 1951, a great deal of consideration was given to the type of study needed, ways to proceed, and specific proposals. Although it was still generally agreed that a guide for such a study should be based on the *Minimum Standard for Pharmacies in Hospitals,* there appeared to be sharp conflict in thinking as to the actual needs of hospital pharmacy, both organizationally and from the standpoint of hospital pharmacists as practitioners. At that time, there appeared to be no clear understanding of the type of survey which should be undertaken. The representatives of the hospital associations did emphasize the fact that hospitals were being deluged with questionnaires and made a strong plea for a serious study which would have long-range beneficial effects to hospitals as well as to pharmacy.

In view of the discussions at this 1951 meeting of the Policy Committee, Dr. Robert P. Fischelis suggested the following action which is reported in the Minutes of the Policy Committee:*

> That the Policy Committee give further consideration to the general problem of surveys of functions and extent of pharmacy service in hospitals, with the view to integrating such surveys and studies with the developing accreditation program now being established for hospitals in general.
>
> Further discussion of the surveys dealing with hospital pharmacy, including the proposed survey in cooperation with the Public Health Service and surveys intended to establish the quality and cost of pharmacy service in hospitals; also surveys dealing with the extent of compliance with the *Minimum Standard for Pharmacies in Hospitals* adopted by the Division and endorsed by the various professional societies affected, led to the adoption of the following statement of policy:
>
> 1. That the Policy Committee recognize that its activities both for health service in general and pharmacy in particular, require deliberate and considerable long-range planning and possibly guidance from specialists in techniques of planning.
>
> 2. The Policy Committee believes that the time is not propitious for surveys on the quality and cost of pharmacy service in hospitals.
>
> 3. The Policy Committee believes that the Hospital Pharmacy Survey to be conducted in cooperation with the U. S. Public Health Service should be the first step in the development of information on current hospital pharmacy practice.
>
> 4. Immediate attention should be given to impressing upon the national hospital accrediting agency the importance of pharmacy to the patient in all hospitals; and, incidentally, to the facilities now available for improving hospital pharmacy services, education of hospital pharmacists and the development of a sound hospital pharmacy program, all of which are available through the Division of Hospital Pharmacy of the APhA and the ASHP.
>
> 5. Acquiring incidental information through surveys on specific items such as costs, extent of service, etc., should be subordinated for the present to the broader program outlined in the foregoing paragraph.
>
> 6. That one of the immediate steps in the direction of developing the Minimum Standard program should be a pilot survey, conducted by the ASHP Committee on Minimum Standards with the help of the Policy Committee, on a sufficient number of properly diversified hospitals to determine the adequacy of these standards.

During subsequent years, 1952 and 1953, several possible surveys of hospital pharmacy were considered but not carried out for one reason or another. In the meantime, the American Society of Hospital Pharmacists had appointed a Special Committee to Study the Role of the Pharmacist in Small Hospitals. This Committee was also concerned with a possible survey of hospital pharmacy, particularly in the area of small hospitals. During this time, Mr. Thomas Foster, who was Chairman of the Committee, cooperated in seeking possible ways of carrying out the proposed survey. The proposed questionnaire which was originally worked out with the Division of Hospital Facilities of the Public Health Service was still under consideration. By this time, efforts had been made to put this questionnaire in a form which would facilitate use and compilation of results. Although the use of electronic data processing was considered, it was believed to be too expensive at that time. As a result, Mrs. Gloria Niemeyer Francke, who was then Assistant Director of the Division of Hospital Pharmacy, set up the questionnaire in accordance with the Keysort System. This was submitted to Dr. Fischelis as Chairman of the Policy Committee of the Division of Hospital Pharmacy in 1952.

In 1954, Dr. Fischelis also met with Dr. J. R. McGibony, then of the University of Pittsburgh School of Public Health, to discuss a proposed audit of pharmacy service. At that time Dr. McGibony submitted a proposal and asked for cooperation from the Division. Although much thinking and work went into this proposal, which did not materialize, it is apparent that it was from these discussions that the basis for the Audit of Pharmaceutical Service in Hospitals was developed. At the same time, the American Society of Hospital Pharmacists was urging the Division to proceed with a survey of hospital pharmacy practice, and that immediate study be given to the plan proposed by Dr. McGibony. This was the subject of a resolution passed in 1954 by the American Society of Hospital Pharmacists. Although personnel and funds were not available, leaders in the field continued to give thought to carrying out a survey and the current study is the result of these continued efforts over a period of years.

* Minutes of Policy Committee Meeting, November 24, 1951, Washington, D. C.

1.2 Grant Approved

During the first session of the 84th Congress (1955), an appropriation for carrying out the Medical Facilities Survey and Construction Act of 1954 (Public Law 42) was approved. Since this provided appropriations for research projects in connection with hospital practices, the proposal for an Audit of Pharmaceutical Service in Hospitals was submitted to the Department of Health, Education, and Welfare, U. S. Public Health Service. Late in 1955, the American Pharmaceutical Association was named the recipient of a $36,000 grant for the study and immediate plans were made to proceed. (See letter to Dr. Don E. Francke, dated December 21, 1955, Appendix E.) A release to the pharmaceutical press announcing the fact that the American Pharmaceutical Association was named the recipient of a grant was made on February 2, 1956. (See Appendix F.)

An application for extension of the grant (with additional funds) was made in 1956 and further extensions for time were obtained in later months. Accordingly, a total of approximately $70,000 in funds was received from the U. S. Public Health Service for carrying out the Audit of Pharmaceutical Service in Hospitals.

2

ORGANIZATIONAL PLAN

Following approval of the "Application for Research Grant," in late 1955, Dr. Fischelis proceeded with plans for beginning the study with Dr. Don E. Francke, then Director of the Division of Hospital Pharmacy, as Principal Investigator. According to the plan, Dr. Francke would continue in his position as Director of Pharmacy Service at the University of Michigan Medical Center, Ann Arbor, devoting part-time to the Audit of Pharmaceutical Service in Hospitals. Dr. Francke was designated as Program Director and Mr. Clifton J. Latiolais, then Chief Pharmacist at Strong Memorial Hospital in Rochester, N. Y., became Assistant Program Director on a full-time basis with offices at the University Hospital in Ann Arbor. Other personnel employed on the Audit over a three- to four-year period included Mrs. Gloria Niemeyer Francke, also a pharmacist and, then, Secretary of the American Society of Hospital Pharmacists, who worked as a Research Associate. Mr. Norman F. H. Ho, a member of the pharmacy staff at the University Hospital, worked on the Audit on a part-time basis beginning in 1960. A secretary, Mrs. Ruth Vermetten, was employed late in 1956 and served throughout the Audit. The assistance of several part-time individuals and consultants was also utilized as needed throughout the survey.

2.1 Survey Research Center

At an early stage in the Audit, Dr. Francke contacted the Survey Research Center of the Institute of Social Research, University of Michigan, to seek advice and possible assistance with the sampling, tabulation, coding, processing, and other procedures related to collecting data by questionnaire.

On July 16, 1956, a meeting of Francke, Latiolais, and Francke was held with Dr. Angus Campbell, Director of the Survey Research Center, who discussed the organizational setup, service and financial arrangements which could be made between the Center and the Audit. In accordance with these discussions, it was agreed that the Audit personnel would work directly with Dr. Charles Cannell, Director of Field Operations of the Center. When necessary, Dr. Cannell was to make arrangements for working with personnel in specific sections of the Center, *i.e.*, sampling, coding, tabulation, etc. Although the principal responsibility in all phases of the Audit was centralized in the Audit office, it was agreed that the Survey Research Center would provide the following services:

1. General assistance in planning and methodology.
2. Assistance with questionnaire construction and pretesting.
3. Assistance with scientific sampling procedures.
4. Assistance with the coding of data.
5. Perform the mechanical tabulation of data.
6. General counsel and assistance with specific problems.

Availability of the services of the Survey Research Center was most fortunate. In fact, its services rendered in the area of counseling could scarcely be duplicated elsewhere.

In setting up the working offices for the Audit, general facilities were made available through the University of Michigan Medical Center in Ann Arbor. These facilities at first included two rooms which were assigned for use of personnel working on the Audit. At a later date (May 1959) the office was moved to one large room due to construction in the Hospital. Office furniture for use on the Audit was in part loaned by University Hospital and in part purchased for specific use on the Audit. Also provided through the facilities of the University Hospital were library services, mimeographing, housekeeping, etc. Also, some services were made available by the American Pharmaceutical Association in Washington. In particular, the financial books and records were maintained in the Washington office.

2.2 Committees

Original plans called for three or more committees which would be active in carrying out the Audit. These would have included the Advisory Committee, the Executive Committee, and various technical com-

mittees. After further consideration, it seemed more expedient and advantageous to combine the so-called executive and technical committees into one, this to be known as the Committee on Hospital Pharmacy Practice. Accordingly, throughout the survey, two committees—the Advisory Committee and the Committee on Hospital Pharmacy Practice—were utilized. In addition to the members of the Committees, other individuals were invited to participate as consultants in special areas of study.

The Policy Committee of the Division of Hospital Pharmacy of the American Pharmaceutical Association and the American Society of Hospital Pharmacists served as the Advisory Committee. This was composed of representatives of the American Pharmaceutical Association, the American Society of Hospital Pharmacists, the American Hospital Association, and the Catholic Hospital Association. In accordance with early plans, it was stated that "The Advisory Committee will advise on the scope of the survey and on general methods of procedure, will assist in formulating recommendations and suggest methods of carrying them out, and will give advice and assistance on various aspects of the Audit." This Committee met several times during the Audit and results of its deliberations are reported in a later section of Chapter IV.*

The Committee on Hospital Pharmacy Practice was set up with more specific responsibilities which were outlined as follows:

1. Assist in integrating the recommendations of the Advisory Committee into the Audit plans.
2. Review specific sections of the Audit design and make suggestions and recommendations to the Program Director.
3. Assist in solving specific problems arising in the general conduct of the Audit.

The names of individuals who served on the Advisory Committee (Policy Committee of the Division of Hospital Pharmacy of the American Pharmaceutical Association and the American Society of Hospital Pharmacists) and the Committee on Hospital Pharmacy Practice appear on page xi.

Members of both the committees mentioned above, along with a number of selected individuals who could be helpful in specific areas, were designated as "Consultants on Findings." A copy of the Preliminary Report of the Findings was sent to these individuals for suggestions and comments which were utilized in the Final Report. Names of those individuals who served as Consultants on Findings are listed on page xi.

Although planning was begun by the Director in late 1955, the full-time Assistant Director, Mr. Clifton Latiolais, was not available until March 1956, at which time the intensive work of the survey was started. Mr. Latiolais continued on a full-time basis until October 1958. The Preliminary Report of the Findings of the Audit was available in late September 1958 and, at that time, copies were sent to the Consultants on Findings (including members of the Advisory Committee and the Committee on Hospital Pharmacy Practice) for comments. By January 1, 1959, these comments were received and the analysis of the data and preparation of the final document was begun.

2.3 References to Questionnaires

Within the various chapters we have made reference to the original questions asked in the questionnaire. These questionnaires are contained in Appendixes A, B and C. The designation Q followed by a number, as (Q 1), refers to the first question in the questionnaire sent to all hospitals *with* a pharmacist, Appendix A. The designation Q 1S refers to the first question from the questionnaire sent to all hospitals *without* a full-time pharmacist, Appendix B.

The designation SQ 1 refers to the first question from a five-question supplementary questionnaire sent to all hospitals with a full-time pharmacist, Appendix C.

* The Division of Hospital Pharmacy of the American Pharmaceutical Association and of the American Society of Hospital Pharmacists was dissolved March 27, 1962. The American Society of Hospital Pharmacists assumed obligations for the function of the Division of Hospital Pharmacy under a plan agreed upon with the American Pharmaceutical Association.

IV

Objectives and methodology

1

OBJECTIVES

The basic objectives of the study as originally stated were, "to determine what constitutes good pharmacy service for patients in hospitals and to study methods of improving the quality and expanding the scope of these services in the interest of better patient care."

1.1 Specific Objectives

Although much thought and preliminary discussion had been given to more specific objectives, it was evident that some hypotheses were necessary since no previous studies of this scope had been made in this field. Specific objectives were outlined in the application for research grant, dated October 20, 1955. After study and consideration of the total plan for carrying out the Audit, the following overall objectives of the Audit of Pharmaceutical Service in Hospitals were outlined:

1. To examine the present methods of pharmaceutical practice and service in hospitals, including those hospitals too small to employ a pharmacist full-time.

2. To determine the elements of pharmaceutical service which will promote better patient care.

3. To determine how these elements of service may be more effectively performed for the benefit of the patient, the medical and allied staffs, and the hospital.

4. To consider the education and training desirable for hospital pharmacists to enable them to perform these elements of service.

5. To obtain selected demographic data and a census of hospital pharmacists in order to correlate their educational training and background with the quality and quantity of service performed, and to determine the future needs for trained hospital pharmacists.

6. To determine the facilities, equipment, and personnel necessary to perform those elements of pharmaceutical service necessary to promote better patient care in hospitals of various sizes and types.

7. To study the economics of providing pharmaceutical service in hospitals.

8. To recommend a plan of action for the implementation of the findings of the Audit.

These objectives constituted a guide for carrying out the overall survey.

In working with the various facets of the Audit, specific objectives were worked out under the following broad categories:

1. Determination of elements of administrative and professional pharmacy service.

2. Factors influencing hospital pharmacy service.

3. Economics of providing pharmacy service in hospitals.

4. Special problems in providing pharmacy service in hospitals with less than 75 beds.

Each of the above categories was explored thoroughly in determining the type of information which could be obtained from the Audit. It was not possible to meet these objectives fully; however, information supplied by the work carried out under each category will serve as helpful background for future investigators.

In considering the objectives, those concerned were aware of the complexities resulting from the number and type of variables in the field of hospital pharmacy. Further, the fact that there had been no projects of a similar nature in this specialty was a true indication that little or no documented or statistically sound information was available. Therefore, in accordance with the original concept of the Audit, an effort was made to explore every possible factor of hospital pharmacy practice, knowing well that complete data could neither be collected nor utilized in this study. Thus, in the end, a vast amount

of data was obtained which could not be utilized without further study. This information is available, however, for those who may undertake further studies in this field.

1.2 Hospitals without Pharmacists

In considering the hospitals without the services of a pharmacist, a different set of objectives was sought. The following specific objectives were established in an effort to examine the present methods of handling drugs in those hospitals without a pharmacist:

1. To learn what pharmacy services are being provided.
2. To learn who is responsible for providing these services.
3. To obtain the administrator's attitude toward pharmacy service.
4. To learn the status of drug inventory and annual drug purchases.
5. To learn the status of pharmacy and therapeutics committees and formulary systems.
6. To obtain data on present pharmacy facilities.

Although it was originally estimated that the Audit would proceed for approximately two years, it was soon evident that the many facets of hospital pharmacy practice requiring attention would result in a more lengthy study. It was, therefore, necessary to plan thoroughly and to determine priority areas. This alone was a time-consuming task that resulted in the collection of much background information in areas not included in the final report. Such studies are mentioned elsewhere in this report and all material gathered is available in the files of the Audit.

2

METHODOLOGY

In the following paragraphs, an attempt will be made to outline briefly each of the stages of the survey, indicating the specific work which was carried out in each stage. Detailed reports of work done were made available in the form of "Progress Reports," which were submitted periodically to Dr. Robert P. Fischelis, then Secretary of the American Pharmaceutical Association, and to others concerned.*

2.1 Planning

Initial efforts were concentrated on the planning phase which consumed a great amount of time well spent. It was felt that careful and detailed attention must be given to planning a comprehensive study of this type. As a result, an attempt was made to review every phase of hospital pharmacy practice, noting interrelationships among the various factors involved in providing services. A complete exploration of the literature and of all prior studies was carried out.

Upon nearing completion of the planning stage, a meeting of the Advisory Committee was held in Chicago on August 25 and 26, 1956, to review progress to date as well as to consider the objectives of the Audit as outlined in the First and Second Progress Reports. Members of the Advisory Committee gave constructive comments on the scope of the survey, limitations and priorities, general methods of procedure, relationship with hospital associations, and work assignments to the Committee on Hospital Pharmacy Practice.

The following are among the principal suggestions which the Advisory Committee asked the Audit staff to consider in further developing the program for carrying out the study.

1. Seek cooperation of the American Hospital Association (Council on Professional Practice) and the Catholic Hospital Association (Committee on Pharmacy Practice).

As a result of this recommendation, the Program Director requested the cooperation of the hospital associations through Dr. Sarah Hardwicke, then Secretary, Council on Professional Practice, American Hospital Association, and Mr. M. R. Kneifl, then Executive Secretary, Catholic Hospital Association. Letters endorsing the survey are included in Appendixes G and I.

2. Inform hospital administrators regarding objectives and procedures being utilized in securing data. It was also noted that the study would be accepted more readily if the term "Audit" were not used.

This recommendation was carried out by sending releases for publication in the various hospital journals. Releases for publication were also sent to all state hospital associations. In this way, administrators were informed regarding the objectives of the Audit prior to receiving the questionnaire in their hospitals. Although no official change could be made in the name of the project, that is, *Audit* of Pharmaceutical Service in Hospitals, care was taken to refer to it as "study" or "survey" whenever possible.

3. Keep objectives of questionnaire as short as possible in scope and limit the number of attitude or qualitative questions.

These factors were explored with people at the Survey Research Center and were taken into consideration in developing the questionnaire.

* The following Progress Reports, along with the Preliminary Report of the Findings, constitute a complete running account, along with copies of all documents, covering details of the Audit work: First Progress Report (June 16, 1956), period covered—January 1 to June 16, 1956; Second Progress Report (July 31, 1956), period covered—June 17 to July 31, 1956; Third Progress Report (April 15, 1957), period covered—August 1, 1956 to April 15, 1957; Fourth Progress Report (December 31, 1957), period covered—April 16 to December 31, 1957; Preliminary Report of the Findings (September 30, 1958).

4. Attempt to utilize information and services already available, particularly on a state and local level.

Every effort was made to develop background material from information (surveys, etc.) already available. In general, it was later concluded that little comprehensive information on hospital pharmacy practice was available.

5. During the continuation of the project and in preparing the final report, keep in mind the need for concise, practical recommendations for implementation.

The Committee on Hospital Pharmacy Practice met in Chicago on August 24, 1956, and again in Ann Arbor, Mich., on March 1 and 2, 1957. This Committee was concerned chiefly with reviewing specific areas of the Audit to determine the adequacy of the overall objectives and to give technical advice with regard to hospital pharmacy practice. After developing the objectives of the Audit, each Committee member was assigned a section for study. Comments received were detailed and helpful in developing the final questionnaire.

The March meeting of the Committee on Hospital Pharmacy Practice was called to explore various areas affecting hospital pharmacy practice which should be covered in the Audit. The principal objective was to determine to what extent special studies could be carried out under the Audit, from the standpoint of advisability, need, time, and funds available. These included studies on Education and Training in Hospital Pharmacy, Pharmacy Service in Small Hospitals, Product Duplication and Substitution, Distribution Systems of Drugs in Hospitals, Standards of Measurement of Workloads in Hospital Pharmacy Practice, and Legal Aspects of Hospital Pharmacy Practice.

At the March meeting of the Committee on Hospital Pharmacy Practice, considerable attention was given to the areas of Education and Training and Pharmacy Service in Small Hospitals. Special consultants in each of these areas were asked to participate.

Dr. Melvin Green, Director of Educational Relations of the American Council on Pharmaceutical Education, presented his views regarding the needs in education for hospital pharmacists as related to the total profession, trends in education, and the five- and six-year programs. Mr. Dan Moravec, Pharmacy Editor of *Hospital Management* and Chief Pharmacist at Lincoln General Hospital in Lincoln, Neb., also participated. He presented his views regarding the need for pharmaceutical service in small hospitals. Mr. Moravec's observations were the result of a survey he made in a number of midwest hospitals under 100 beds. Mr. Leo Godley, then Chief Pharmacist at Bronson Methodist Hospital in Kalamazoo, Mich., but now at Harris Hospital, Fort Worth, Tex., was invited for specific help with regard to distribution systems for drugs in hospitals.

Throughout the planning stage, members of the Audit staff were in close contact with Dr. Charles Cannell, of the Survey Research Center. Topics discussed at meetings with Dr. Cannell included the general methodology of the survey, questionnaire construction and pretesting, sampling procedures, data collection, and approximate time schedules. In all of these areas, the help and advice received from personnel at the Survey Research Center were invaluable.

Following determination of the objectives of the overall study, members of the Audit staff proceeded to complete the planning stage. This included decisions on methods of pursuing the objectives, based on factors such as time, personnel, and budget. From discussions with Dr. Cannell, it appeared that the principal methods of securing data should be through questionnaires and interviews. Actually, questionnaires were finally used almost entirely, with interviews on a small sample to verify data acquired through questionnaires. Interviews were believed not to be essential in view of the facts that the questionnaires had been pretested and also because good response to the questionnaires was anticipated.

2.2 Sampling

Before determining the sample for the study, a complete review was made of all available pertinent statistics in the field of hospitals and hospital pharmacy. This was not only for the purpose of background, but to find a satisfactory source of a listing of institutions which should be surveyed or included in the study. Little information was available as to which hospitals employed pharmacists. For instance, although each state has its list of registered pharmacists, it is not always possible to determine where these people are practicing, since some states do not require annual registration. After careful consideration, it was believed that the 1956 Listing of Hospitals of the American Hospital Association would be most satisfactory on which to base the sample. Any institution which can be classified as a hospital, according to the requirements set up by the American Hospital Association, may be included in this list if the hospital requests it. Membership in the American Hospital Association is not a requirement for accepting hospitals for listing. Availability of the American Hospital Association listing facilitated determination of the sample on an efficient and economic basis, and from this listing the Sampling Section of the Survey Research Center proceeded with determining the sampling procedure.

Members of the Audit staff met with Dr. Leslie Kish, of the Survey Research Center, to prepare a scientifically selected sample of hospitals which accurately represented the total hospital universe. It was not feasible, nor was it essential, to utilize every hospital in the United States for the collection of data for the study. The Sampling Section of the Survey Research Center, therefore, working under the direction of Dr. Kish, prepared the sample from the 1956

Listing of Hospitals of the American Hospital Association. This listing comprised 7063 hospitals in the forty-eight states and included the District of Columbia.

It was, of course, well known that over 90 percent of short-term general and special hospitals of 100 bed capacity and over employ full-time pharmacists. This, then, was the important group of hospitals for the purpose of collecting data on hospital pharmacy practice. It was, therefore, decided to construct a comprehensive questionnaire and send it to all of these hospitals.

With the constructive guidance of the staff of the Survey Research Center, the large questionnaire underwent numerous revisions. By January 1957 a satisfactory draft was ready for pretesting. The purpose of such a pretest is threefold: (1) to see if the respondent understands the questions (*i.e.*, wording, ambiguity, applicability of response categories, etc.); (2) to find out if the respondent interprets the questions as is intended; and (3) to find out if the responses yield the information pertinent to the specific objectives of the study.

In January 1957 the questionnaire was pretested in 19 hospitals of varied sizes and types in Toledo, Ohio, and in Ann Arbor and Detroit, Mich. These pretested questionnaires were analyzed and revisions made as indicated. The final questionnaire was printed and mailed to 1948 hospitals on March 22, 1957. This questionnaire is included in the Appendix A.

The number of pharmacies employing a full-time pharmacist in general and special short-term hospitals under 100 beds and in general and special long-term hospitals is relatively small. The amount of information on pharmacy practice which can be obtained from these hospitals is thus correspondingly small. It was felt, therefore, that a sample representing one-third of these hospitals would yield a sufficiently accurate representation (with a sample error of about 2 percent) of the total universe. The hospitals selected at a one-third rate were balanced according to each individual state so that an accurate projection of data could be made, either by individual states alone, by regional area, or, when combined, for the United States as a whole. Since the sample of hospitals taken at the one-third rate is a statistical representation, the data was "weighted" (multiplied by 3) in order to obtain an accurate representation of the total universe.

In this group of hospitals there is a wide diversity of methods employed for providing pharmacy service. Some of these hospitals have full-time pharmacists, others have part-time pharmacists or an arrangement with a community pharmacy, and still others use hospital personnel other than pharmacists. A mail questionnaire was prepared which was directed to the administrators of these hospitals in order to determine the method used for providing pharmacy service, together with general information about the hospital. The hospitals in this group which were found to *have* a full-time pharmacist were later sent the same questionnaire designed for general and special short-term hospitals over 100 beds. These studies served to find out how and to what extent pharmacy service is being provided, and also to determine the characteristics or factors present in these hospitals which justify the employment of a pharmacist on a full-time basis.

The rest of the hospitals were categorized according to whether pharmacy service was (1) being provided by personnel other than pharmacists, or (2) being provided by community pharmacists on a part-time basis.

The small questionnaire, designed for hospitals *not* having a pharmacist, was pretested in five hospitals without a pharmacist in Seattle, Wash., in June 1957. The completed questionnaire was mailed in July 1957. The questionnaire designed for small hospitals without a pharmacist is included in the Appendix B.

Although in the final analysis, the results of the questionnaire sent to hospitals *with* a pharmacist and the one sent to hospitals *without* a pharmacist were considered separately, determination of the sample was made on the basis of *all* hospitals listed. At the proper time then, these were separated, sending the large questionnaire to hospitals with a pharmacist and the small questionnaire to hospitals without a pharmacist. When indicated, the results can be broken down by bed size and by regional area as shown in Figure 1.

FIGURE 1. States Classified by Regional Area

New England
- Maine
- New Hampshire
- Vermont
- Massachusetts
- Rhode Island
- Connecticut

Mid Atlantic
- New York
- New Jersey
- Pennsylvania

South Atlantic
- Delaware
- Maryland
- District of Columbia
- Virginia
- West Virginia
- North Carolina
- South Carolina
- Georgia
- Florida

East North Central
- Ohio
- Indiana
- Illinois
- Michigan
- Wisconsin

East South Central
- Kentucky
- Tennessee
- Alabama
- Mississippi

West North Central
- Minnesota
- Iowa
- Missouri
- North Dakota
- South Dakota
- Nebraska
- Kansas

West South Central
- Arkansas
- Louisiana
- Oklahoma
- Texas

Mountain
- Montana
- Idaho
- Wyoming
- Colorado
- New Mexico
- Arizona
- Utah
- Nevada

Pacific
- Washington
- Oregon
- California

TABLE 1. Summary of Sampling Data, Number of Responses to Questionnaires and Projection Factors

Bed Capacity	Total Hospitals, Continental U. S., 1957	Number of Hospitals in Sample[1]	Number of Hospitals Responding to Questionnaires		Number of Additional Hospitals with Pharmacists, Determined by Telephone Calls	Total Hospitals, Continental U. S., 1957		Factor for Projecting Findings from Hospitals with Pharmacist for Total Hospitals
			With Pharmacist Full-Time	With No Pharmacist		With Pharmacist Full-Time	With No Pharmacist	
Short-term								
Under 50	2409	814	48[2]	1335[2]	36	84	2325	1.75
50–99	1296	434	156[2]	642[2]	75	231	1065	1.48
100–199	973	973	546	214	157	703	270	1.29
200–299	461	461	363	17	81	444	17	1.22
300–399	229	229	198	1	30	228	1	1.15
400–499	113	113	95	0	18	113	0	1.19
500 and over	164	164	144	0	20	164	0	1.14
Long-term								
All sizes	1359	463	303[2]	540[2]	69	372	987	1.23
Total	7004	3651	1853	2749	486	2339	4665	1.27

[1] Prepared from 1956 Listing of Hospitals.
[2] Weighted by factor of 3 to obtain estimate of entire universe, that is, 16 × 3 = 48 short-term hospitals, under 50 beds; 52 × 3 = 156 short-term hospitals, 50–99 beds; 101 × 3 = 303 long-term hospitals, all sizes, etc.

The following table indicates the type and size of hospitals used as strata and the number of hospitals in each stratum which were selected for the sample:

Strata	*Number of Hospitals in Sample*	*Total Universe*
I. General and special short-term, 100 beds or over	1948	1948
II. General and special short-term, 50 to 99 beds	434	1302
III. General and special short-term, 25 to 49 beds	492	1474
IV. General and special short-term, 1 to 24 beds	322	965
V. General and special long-term, all sizes	458	1374
Total sample	3654	7063

Stratum I was selected at a full rate, *i.e.*, every hospital in this category is included in the sample. Strata II through V were selected at a one-third rate, *i.e.*, every third hospital in each of these categories is included in the sample.

The summary of the sample data is shown in Table 1 which describes the number of hospitals with and without full-time pharmacists in short- and long-term hospitals and by bed size, and also in Table 2 which further condenses the data in the former table by percent of responses. Some hospitals were reported closed or had merged with other hospitals.

2.3 Collecting Phase

With the mailing of the large questionnaire, the collecting phase was well underway. As questionnaires were returned, each was checked for completeness and a record made of its receipt. Each questionnaire had been given a number before it was mailed so that it could be identified on return. In cases in which the large questionnaire, designed for hospitals having a pharmacist, was returned because no pharmacist was employed, the hospital was sent a questionnaire designed for a hospital without a pharma-

TABLE 2. Summary of Sampling Data, Percent of Responses to Questionnaires, and Percent of Hospitals with and without Pharmacists

Bed Capacity	Percent of Hospitals Responding to Questionnaire			Percent of Hospitals with Pharmacists	Percent of Hospitals without Pharmacists
	With Pharmacist	Without Pharmacist	Total Responses		
Short-term					
Under 50	57.14	57.42	57.41	3.49	96.51
50–99	67.53	60.28	61.58	17.83	82.17
100–199	77.67	79.26	78.11	72.25	27.75
200–299	81.76	100.00	82.43	96.31	3.69
300–399	86.84	100.00	86.50	99.56	0.44
400–499	84.07	—	84.07	100.00	0
500 and over	87.81	—	87.81	100.00	0
Long-term					
All sizes	81.45	54.71	62.04	27.37	72.63
Average	79.22	58.93	65.71	33.40	66.60

Source of data: Table 1.

cist. At the same time, comments on the questionnaires were recorded and a review of these gave some indication of the overall interest in the objectives of the study.

During this period, periodic follow-up letters were also sent in order to obtain a good response. It was felt also that a letter from Dr. Edwin L. Crosby, Executive Director of the American Hospital Association, urging hospital administrators to cooperate in this study, would aid considerably in obtaining a high response rate. This proposal, made to the Joint Committee of the American Hospital Association and the American Society of Hospital Pharmacists, was approved and forwarded to the Council on Professional Practice of the American Hospital Association. Dr. Crosby agreed to support this project and his letter to administrators was included with the mailing of the questionnaire. (See Appendix J.)

Since the survey group was so heavily dependent upon the respondents to complete and return the questionnaires, hospital pharmacists and administrators throughout the country were informed about the Audit, including general information, objectives, significance, etc. A news release was sent to national, regional, and state pharmaceutical and hospital publications. It was also sent to all Affiliated Chapters of the American Society of Hospital Pharmacists with a letter requesting the cooperation of their members in this study. A copy of the news release is included in Appendix H. Numerous articles on the Audit appeared in the press while the study was underway.

TABLE 3. General Description of Hospitals with Pharmacists by Type of Service, Length of Stay, Ownership, Bed Capacity, Region, and Affiliation with Medical School. 1853 Hospitals Reporting in Survey Sample

	Short-Term[1]								Long-Term,[2]	
	Bed Capacity									
	Under 50	50–99	100–199	200–299	300–399	400–499	500 and Over	Hospitals Reporting	Bed Capacity, All Sizes	Total Hospitals Reporting
Continental U. S.—Total	**48**	**156**	**546**	**363**	**198**	**95**	**144**	**1550**	**303**	**1853**
Type of service										
General	45	153	518	346	193	94	140	1489	87	1576
Special	3	3	22	10	4	0	1	43	216	259
Ownership										
Governmental-Non-Federal—Total	**0**	**24**	**89**	**43**	**18**	**15**	**43**	**232**	**159**	**391**
City	—	3	21	13	6	4	11	58	6	64
County	—	15	30	15	6	4	10	80	21	101
City-County	—	—	23	9	1	5	6	44	—	44
State	—	6	15	6	5	2	16	50	132	182
Governmental-Federal—Total	**12**	**21**	**42**	**18**	**20**	**22**	**39**	**174**	**120**	**294**
Army	—	6	12	1	2	6	8	35	3	38
Navy	—	—	3	2	4	1	10	20	—	20
Air Force	—	12	11	4	3	1	3	34	—	34
Public Health Serv.	12	—	4	2	3	2	2	25	15	40
Veterans Admin.	—	3	12	9	8	12	16	60	102	162
Other Federal	—	—	—	—	—	—	—	—	—	—
Non-Governmental—Total	**36**	**111**	**412**	**297**	**160**	**56**	**60**	**1132**	**21**	**1153**
Church	3	48	163	125	74	28	23	464	12	476
Community	3	6	76	39	25	8	5	162	—	162
Fraternal Order	—	—	2	1	—	1	—	4	—	4
Private-Non-Profit	9	48	158	130	61	18	32	456	6	462
Private-Profit	21	9	13	2	—	1	—	46	3	49
Region										
1. New England	3	9	47	22	16	5	9	111	30	141
2. Middle Atlantic	3	3	104	79	43	22	31	285	57	342
3. South Atlantic	3	15	63	38	29	11	16	175	21	196
4. East North Central	6	30	107	88	46	12	35	324	72	396
5. East South Central	3	18	28	19	9	9	4	90	12	102
6. West North Central	12	18	68	37	17	9	16	177	24	201
7. West South Central	6	21	39	31	13	11	13	134	33	167
8. Mountain	3	15	35	19	5	5	2	84	21	105
9. Pacific	9	27	55	30	20	11	18	170	33	203
Affiliation with Medical School	**9**	**6**	**52**	**57**	**53**	**95**	**75**	**359**	**93**	**452**
Principal Hospital	—	3	13	17	13	83	53	194	12	206
Not Principal Hospital	9	3	39	40	40	12	22	165	81	246

[1] 18 no responses indicating whether general or special service in short-term hospitals: 6 in 100–199 beds, 7 in 200–299 beds, 1 in 300–399 beds, 1 in 400–499 beds, and 3 in 500 beds and over. Also 12 no responses indicating ownership in short-term hospitals.
[2] 3 no responses indicating ownership in long-term hospitals, all sizes.

Other methods of improving response were also utilized, including telephone calls which were made to chief pharmacists by members of the American Society of Hospital Pharmacists throughout the country. Because this organization is closely knit and its leaders throughout the country are well known, it was possible to devise a plan whereby a well-known hospital pharmacist in each particular area called as many as 15 or 20 chief pharmacists reminding them to return the questionnaire. This individual contact seems to have had considerable effect and, although it was not possible to determine the exact response as the result of the telephone calls, it is evident from the results that this was a most effective procedure. In implementing this procedure, mimeographed forms were sent to the chief pharmacists who did the calling, and they filled out the forms giving details regarding their conversations with the various chief pharmacists to whom they talked by telephone. For example, some chief pharmacists promised to return the questionnaire immediately; others said the administrator had the questionnaire; and some refused to complete the questionnaire, etc. This method of contacting chief pharmacists yielded good results in that answers as to the status of the unreturned questionnaires were obtained in a relatively short period of time. It was also helpful in determining whether these hospitals had a pharmacist full-time. This method was relatively inexpensive when compared to sending out an additional letter and questionnaire.

Also a factor in securing response to the questionnaire was the publicity in the various hospital and pharmaceutical publications. Of particular note were items which appeared in *This Month at the American Hospital Association* (April 1957 and October 1957), a newsletter which was sent to all hospital administrators, and also an editorial entitled "Significance of Audit of Pharmaceutical Service" which appeared in *The Bulletin of the American Society of Hospital Pharmacists 14*:163 (March-April) 1957.

2.4 Response

Responses to the questionnaire were obtained from 1853 short- and long-term hospitals with pharmacists (Table 1). It was determined through telephone calls that an additional 486 hospitals were serviced by pharmacists; however, these did not return a questionnaire. Thus the response rate to the questionnaire was 79.22 percent of the 2339 total hospitals of all sizes with pharmacists in the continental United States in 1957. However, since the general and special short-term hospitals with 100 beds or over are the principal groups that employ full-time pharmacists, we will discuss the majority of the findings of the survey on the basis of the 83.63 percent response rate received from these groups of hospitals.

Among the other hospitals with full-time pharmacists, about 60 percent of short-term hospitals under 100 beds and 62 percent of long-term hospitals of all bed sizes responded (Table 2).

The response rate from hospitals without full-time pharmacists was 58.93 percent. This group consists principally of short-term hospitals under 100 beds and long-term hospitals of all bed sizes. The response rate and projection factor for this group are treated in more detail in Chapter X.

About one-third of the nation's hospitals, that is, 2339 out of 7004 general and special short- and long-term hospitals, in 1957 were serviced by full-time pharmacists and these were concentrated mainly in short-term hospitals of 100 beds and over, which represents only 27.7 percent of all hospitals. As shown in Table 2, about 3 out of 4 short-term hospitals of 100–199 beds and nearly all hospitals of 200 beds and over employ full-time pharmacists. In contrast, only 3.5 and 17.8 percent of hospitals under 50 and 50–99 beds, respectively, employ pharmacists.

Table 3 describes those 1853 hospitals with pharmacists in frequency array by type of service, length of stay, ownership, bed capacity, region, and affiliation with a medical school. The sample consists of 1550 short-term hospitals (83.7 percent) and 303 long-term (16.3 percent) hospitals. Nearly all of the short-term hospitals (97 percent) provide general service. On the other hand, over two-thirds of the long-term hospitals (71 percent) provide special medical services. Over 9 out of 10 long-term hospitals are government-owned, that is, 52.5 percent non-federal and 39.6 percent federal hospitals. Seventy-three percent of short-term hospitals are non-governmental, 12 percent governmental, federal, and 15 percent non-federal. There are 452 out of 1853 hospitals (24.4 percent), which are affiliated with a medical school, either being the principal hospital (45.6 percent) or outlying affiliated hospital (54.4 percent). Eight out of 10 are short-term hospitals. Almost 90 percent of hospitals with 400–499 beds serve as a principal teaching hospital. More than one-third of hospitals with 500 beds and over are affiliated with a medical school as the principal teaching hospital.

TABLE 4. Summary of Sampling Data, Number of Responses to Supplementary Questionnaire Sent to 1853 Hospitals Reported with Full-Time Pharmacists

Bed Capacity	Number of Hospitals in Sample[1]	Number of Responses	Percent Responses
Short-term			
Under 50	48	48	100
50–99	156	156	100
100–199	546	407[2]	74.54
200–299	363	363	100
300–399	198	198	100
400–499	95	95	100
500 and over	144	144	100
Long-term			
All sizes	303	282	93.07
Total	1853	1693	91.37

[1] For source of sampling rate, see Table 1 under hospitals reported with pharmacists.
[2] Including 3 hospitals reported closed.

Because the questionnaire intended for hospitals with pharmacists did not clarify (a) the relative roles of the pharmacy and central sterile supply departments in the preparation of sterile solutions, (b) hours worked per week, (c) sex of the chief pharmacist, and (d) outpatient pharmacy service regarding location, number of prescriptions, and types of patients served, *i.e.*, indigent or non-indigent, a supplementary questionnaire (see Appendix C) was sent to those 1853 hospitals which originally replied to the large questionnaire. The sampling data to the supplementary questionnaire is shown in Table 4 and the response rate was 91.37 percent.

2.5 Analysis

To analyze the data, an analysis design was prepared. This related the questions to the coding and subject matter as set up in the objectives. Working closely with the Coding Section of the Survey Research Center, a coding procedure was devised so that each question was assigned specific code brackets. This was essential in order to actually code the data obtained from the completed questionnaires. On certain questions, there was no way of knowing in advance the range of answers to be given by respondents. These questions were left open so that the respondent filled in his answer rather than checking a predetermined bracket. When all questionnaires were returned, the answers to these open-ended questions were tabulated in a frequency array. This served as a basis for preparing the proper code brackets for these questions. Then the actual coding, check coding, punching of data on electronic data processing cards, and verifying the punching procedure was completed by the Coding Section.

Once the individual questionnaires were coded at the Survey Research Center, they were ready for tabulation. Prior to this, table headings were prepared to provide answers to the questions which gave rise to the study. Individual questions, as well as probable relationships between two or more questions, were related to the objectives of the study. From these, tabulation requests were submitted to the Survey Research Center, the raw data was received and transferred to the tables from the tabulation sheets. From these tables, additional tables could be evolved in order to yield the necessary data in a form which could be utilized.

Finally, utilization of the results was made possible through use of the several hundred tables which were set up. The findings obtained in the survey and recorded in the form of tables were then analyzed and interpreted by the Audit staff. The tables were grouped according to subject matter and the results of this grouping formed the outline for this final report. The findings recorded in each table were discussed and interpreted and, finally, recommendations were made for the improvement of the practice of pharmacy in hospitals in the interest of better patient care. A draft of this material, arranged by chapter headings, was then circulated to the various committees and special consultants of the Audit for review and comment. A revised draft of the chapters was then prepared, taking into consideration the comments received.

A meeting of the Advisory Committee on the Audit, representing the American Pharmaceutical Association, American Hospital Association, Catholic Hospital Association, and American Society of Hospital Pharmacists, was held in Washington, August 7, 1963, where the report was discussed, some modifications were made, and publication of the report was authorized.

PART IV

V

The setting within which the pharmacist functions

1

THE HOSPITAL COMPLEX

1.1 Introduction

The hospital is one of society's most complex institutions. From simple beginnings of ministering to the sick-poor, it has moved with dynamic force to become a vital service essential to the continued well-being of all classes of today's society. People now include availability of hospital service as an essential part of their standard of living.

While patient care remains the primary function of the hospital, education and research are its handmaidens. To provide modern patient care it is necessary to assemble a well-coordinated team of specialists representing numerous disciplines. In turn, these specialists must be provided with many types of intricate, often expensive equipment and facilities. The direction of such a complex enterprise necessitates trained administrators or managers to function at several levels.

Throughout the years, several national organizations have made sustained efforts to stimulate constant improvement of hospital management and professional services. The hospital accreditation program initiated in 1918 by the American College of Surgeons and continued through the establishment of the Joint Commission on Accreditation of Hospitals in 1952 has exerted a most beneficial influence. Efforts of the American Hospital Association, the Catholic Hospital Association, and the American Protestant Hospital Association, as well as the various professional societies of specialty groups, have also been responsible for constant improvement and upgrading of hospital services. Many other factors have, of course, contributed also. Among these are the state hospital licensing acts which grew out of the enactment of the Federal Hospital Survey and Construction Act.

To appreciate the professional, social, and economic climate in which the modern hospital pharmacist functions, it may be helpful to review, in at least a cursory manner, some of the functional interrelationships which exist in today's hospital.

1.2 Functions and Interrelationships

The hospital, whether public or private, is an instrument of society. Approximately two-thirds of America's hospitals are non-governmental and this group admits about two-thirds of the nation's hospitalized patients.

In general, the policies of voluntary community hospitals are formulated by boards of trustees whose members are broadly representative of the community as a whole. The trustees, in turn, delegate the day-to-day management of the hospital to a single administrative officer who may be called a director, administrator, or superintendent. Through the administrator, the medical staff is responsible to the board of trustees for the clinical, research, and educational programs of the hospital. The medical staff recommends professional policies for adoption.

The administrator selects all department heads, including the head of the pharmacy department. To his department heads he delegates responsibility and authority so that their departments may be managed effectively within the hospital's broader policies. The department heads function as assistants to the administrator in the management of their respective areas of hospital service. Larger hospitals may have one or more assistant or associate administrators and administrative assistants in addition to department heads. The number and interrelationship of such personnel depend mainly on the size and complexity of the hospital.

Medical staff functions are organized in patterns which become more complex as the number of services and the size of the hospital increase. Even the smallest of the general service hospitals maintains medical, surgical, and obstetrical services. To these basic services, as the hospital increases its functions, may be added such additional services as pediatrics, dermatology, otolaryngology, ophthalmology, etc.

Very important to the smooth functioning of the hospital are the services offered by the business department and other various subdivisions such as purchasing, housekeeping, maintenance, laundry, personnel, storeroom, etc. Specialization within the hospital makes coordination of effort essential. This calls for varying degrees of communication and functional cooperation between the departments.

1.3 Education

Almost all hospitals engage in some form of educational or training activity. Only in this way can properly trained people be made available to fill the future needs of such a complex and specialized organization. Education and/or training is usually provided for hospital administrators, dietitians, social workers, medical record librarians, laboratory, x-ray and physical therapy technicians, pharmacists, psychologists, and others—in addition to physicians, dentists, and nurses. Many hospitals maintain formal affiliation with medical, nursing, pharmacy, and dental schools and thus participate in the training of undergraduate and graduate students, as well as in the training of practitioners of the various health professions. Others carry out important training programs without formal affiliation with a college or university. All of these professions have their own organizations which, in turn, formulate standards of education and training so that their practitioners may be properly prepared. Almost all hospitals offer some type of training for professional personnel; many have several training programs. Without these educational programs, effective health personnel teams could not be organized and adequate patient care would soon be devitalized.

1.4 Research

Research of many kinds is undertaken by numerous groups in hospitals. Clinical research relating to the diagnosis, prevention, and treatment of disease is carried out by the medical staff with the assistance of such related groups as the medical records department, clinical laboratories, and other ancillary agencies. The nursing service and other departments conduct various types of studies to improve patient care. In the larger teaching hospitals there are patient units as well as laboratory units devoted entirely to research. Here, basic research is an important part of the total effort. The clinical evaluation of drugs for the prevention, diagnosis, and treatment of disease is one of the most prevalent types of research conducted in hospitals. Well-conducted drug evaluations involve teamwork among physicians, clinical pharmacologists, nurses, and pharmacists.

These activities—research, education, and patient care—form an integrated whole in a modern medical center. The several professional groups coordinate their teaching and research activities which, in turn, are part of a program to increase the quality of patient care.

It is within this setting that the pharmacist functions. He is a member of the professional team which provides patient service. On the professional side he has a direct relationship with the medical staff, formally through the pharmacy and therapeutics committee and informally in other ways. His relationship with the nursing staff is perhaps less formal and more direct, but none the less important. He is basically responsible to his administrative superior and must also work closely with administrative representatives from business, purchasing, and other departments at various levels. In most instances, there is little in the basic educational background or in the precedents set by the profession as a whole to prepare or guide the hospital pharmacist in functioning as a member of the health care team within the complex hospital environment. Thus, training, in the form of well organized hospital pharmacy internships or residencies, is essential.

2

THE HOSPITAL PHARMACIST AS A DEPARTMENT HEAD

2.1 The Pharmacy Department

The pharmacy is one of the departments of the hospital devoted to the professional care of the patient. It has been aptly described as "the most extensively used of the therapeutic facilities of the hospital." Since 1957, the pharmacy has been included among the essential services of the hospital by the Joint Commission on Accreditation of Hospitals. Its functions encompass all matters related to drugs, chemicals, pharmaceuticals, and biologicals. The responsibilities of the head of the pharmacy department have been set forth succinctly in the *Minimum Standard for Pharmacies in Hospitals* as follows:*

The pharmacist in charge shall be responsible for (A) the preparation and sterilization of injectable medication when manufactured in the hospital, (B) the manufacture of pharmaceuticals, (C) the dispensing of drugs, chemicals, and pharmaceutical preparations, (D) the filling and labeling of all drug containers issued to services from which medication is to be administered, (E) necessary inspection of all pharmaceutical supplies on all services, (F) the maintenance of an approved stock of antidotes and other emergency drugs, (G) the dispensing of all narcotic drugs and

* *Minimum Standard for Pharmacies in Hospitals, with Guide to Application, Am. J. Hosp. Pharm. 15*:992 (Nov.) 1958. Adopted by the American Society of Hospital Pharmacists and approved by the American Hospital Association, Catholic Hospital Association and American Pharmaceutical Association.

alcohol and the maintenance of a perpetual inventory of them, (H) specifications both as to quality and source for purchase of all drugs, chemicals, antibiotics, biologicals, and pharmaceutical preparations used in the treatment of patients, (I) furnishing information concerning medications to physicians, interns, and nurses, (J) establishment and maintenance, in cooperation with the accounting department, of a satisfactory system of records and bookkeeping in accordance with the policies of the hospital for (1) charging patients for drugs and pharmaceutical supplies, (2) maintaining adequate control over the requisitioning and dispensing of all drugs and pharmaceutical supplies, (K) planning, organizing and directing pharmacy policies and procedures in accordance with the established policies of the hospital, (L) maintenance of the facilities of the department, (M) cooperation in teaching courses to students in the school of nursing and in the medical intern training program, (N) implementing the decisions of the Pharmacy and Therapeutics Committee, (O) the preparation of periodic reports on the progress of the department for submission to the administrator of the hospital.

Thus, the pharmacy is the unit of the hospital where all matters related to drugs, except their prescribing and actual administration to the patient, are centralized. It is the hospital's central source of information on drugs, its staff contributes not only an essential professional service to patients but engages also in teaching and participates to various degrees in research and the solution of technical problems. Within this unit, one or more pharmacists, with the assistance of auxiliary personnel, performs professional and administrative or management functions which involve the patient, the administrative officials of the hospital, the medical, nursing, and other professional staffs, and other hospital departments. As a department head, it is the responsibility of the pharmacist directing the activities of the pharmacy to carry out his functions in close harmony with other units of the hospital team.

2.2 Place of the Pharmacist in the Organization

A pharmacist is examined and licensed by the state to practice his profession. As a licensed practitioner he is bound by those laws of the state and of the nation which regulate the general practice of pharmacy and the procurement, distribution, and control of drugs for the public health and welfare. In these matters he is responsible to the law and no administrative edict of a hospital can alter this prime responsibility. A hospital pharmacist may be told when and where to practice his profession but how to practice it is his own responsibility. Thus, the hospital pharmacist is in the same position professionally as are other licensed practitioners whose main base of operation is the hospital. In addition to the law, his ethics and his conscience must be his guides.

A unit as complex as the hospital must have a well-defined pattern of organization, a channel through which the heads of professional and other departments report. The pharmacy is one of the departments organized for the professional care of the patient.

According to the findings of this survey, the vast majority of chief pharmacists report directly to the head of the hospital whether the title of this individual be administrator, superintendent, director, sister superior, or medical officer in charge (Table 5, Q 5). This means that the majority of chief pharmacists are able to deal directly with the head of the hospital and thus communications are facilitated. Chief pharmacists in the larger, more complexly organized hospitals usually report to an assistant administrator. About 5 percent of chief pharmacists report to another hospital official such as the business manager, purchasing agent, etc. This appears to be undesirable because of the orientation of these individuals to business rather than professional aspects of patient service. It would be particularly undesirable if the official had only a limited outlook on the professional contributions of pharmacy to patient service and emphasized only its distributive function. It is especially undesirable for the pharmacist to have to report to the purchasing agent because of the possible conflict of interests in the procurement of pharmaceuticals. This does not rule out, however, maintaining a proper liaison to take advantage of any systems of control, expediting, or financing involving the technicalities of good purchasing procedures without affecting policy.

In view of these factors, it is surprising that as many as 5 percent of chief pharmacists do not report to the head of the hospital or his assistant. About one-third of those who report to other than the head of the hospital or one of his immediate assistants are found in hospitals with less than 100 beds or in long-term hospitals.

Essentially all pharmacists believe they should report to the administrative head of the hospital or, in a very large organization, to one of his immediate assistants.

TABLE 5. Title of Chief Pharmacist's Immediate Administrative Superior, and His Attitude Toward Its Appropriateness

	Number	Percent
Administrator, Superintendent, Director, Medical Officer, etc.	(1683)	91
Business Manager	(22)	1
Dean, college of pharmacy	(5)	<1
Other	(65)	4
No answer	(78)	4
	(1853)	100

Is this the administrative officer to whom chief pharmacists feel they should report?

	Number	Percent
Yes	(1775)	96
No	(49)	3
No answer	(29)	1
	(1853)	100

TABLE 6. Degree of Freedom Chief Pharmacists Have to Operate Department, as Related to the Administrative Superiors to Whom They Report

Title of Immediate Administrative Superior	Number of Hospitals Reporting	Degree of Freedom (Percent of Hospitals) Very Much to Quite a Bit	Fair Amount	Little to None at All
Administrator, Director, Superintendent or Assistants	1105	92	7	1
Chief of Professional Service	62	94	5	1
Medical, Executive or Commanding Officer	60	83	12	5
Business Manager	10	70	20	10
Other[1]	46	85	9	6
No answer as to title of immediate superior	570	91	7	2
Total	1853	91	7	2

[1] Includes Purchasing Agent, Dean of college of pharmacy, etc.

2.3 Degree of Freedom

Hospital pharmacists as a group rate high in the degree of freedom they have to operate the department in the manner they believe it should be operated. When given a choice of five answers ranging from *very much freedom* to *no freedom at all*, 91 percent replied that they have *very much* to *quite a bit* of freedom. Of the remainder, 7 percent stated that they have a *fair amount* of freedom while only 2 percent said they have *little or no freedom* (Table 6, Q 10). It is interesting to note also that pharmacists reporting to the head of the hospital or one of his immediate assistants or to the chief of professional service have the greatest degree of freedom. In contrast, those reporting to the business manager have considerably less freedom, as do those reporting to the executive or commanding officer in military hospitals or to "others." This finding is significant since it emphasizes that the hospital pharmacist functions as an independent professional man to a great degree. Freedom of thought and action are generally rated high among professional groups as important to job satisfaction.

With such a large degree of freedom to operate the pharmacy in the manner he thinks it should be operated, the pharmacist apparently has great opportunity for planning and carrying out improvements in pharmaceutical service. Since he is the expert in his specialty, administrators and others may naturally expect him to formulate and execute such plans as are within his scope, bringing others requiring administrative or budgetary approval to them for consideration. Whether or not he does this and how he does it are factors which must greatly affect the quality and scope of pharmacy service.

TABLE 7. Administrators' Attitude Toward Objectives of Chief Pharmacists Regarding Budget, Personnel, and Facilities

	Number	Percent
Sympathetic	(1687)	91
Indifferent	(100)	5
Unsympathetic	(54)	3
No answer	(12)	1
	(1853)	100

2.4 Cooperative Attitudes

Not only do most pharmacists have considerable freedom in managing their departments but 91 percent of them also feel that their administrators are *sympathetic* to *very sympathetic* toward the objectives chief pharmacists are trying to accomplish regarding budget, personnel, equipment, and space requirements (Table 7, Q 9). In contrast, 8 percent of pharmacists interpret the attitude of their administrators as being *indifferent* or *unsympathetic*. While this may be true in some cases, there is no way of knowing whether, in fact, the administrators are indifferent or unsympathetic or whether perhaps some pharmacists are using this statement as an excuse for their failure to plan carefully for their departmental needs or for their poor presentation of facts and justifications to administrators. Undoubtedly, instances of each exist. We should emphasize that these responses reflect the pharmacist's feelings relative to the attitude of his administrator and not necessarily the administrator's actual attitude.

A large majority, 92 percent, of chief pharmacists believe the pharmacy is *very well* to *well respected* by administration and the medical and allied staffs of the hospital (Table 8, Q 8). Only 6 percent feel that the department is but *somewhat respected*, while 2 percent believe the pharmacy is *not too well respected* or *not respected at all*. Judging from pharmacists' reactions, and their own beliefs, it appears that the pharmacy is well respected by the key groups.

This study also shows that pharmacists believe administrators and members of the medical and nursing staffs have a high degree of interest in working with the chief pharmacist to improve the quality of pharmacy service. However, 92 percent of administrators are interested while only 85 percent of the nursing staff and 79 percent of the medical staff have, in the opinion of pharmacists, comparable interests

TABLE 8. How Well Chief Pharmacists Think Pharmacy Is Respected Among Medical and Allied Staffs and Administration

	Number	Percent
Very well to well respected	(1696)	92
Somewhat respected	(120)	6
Not too well to not at all respected	(27)	2
No answer	(10)	<1
	(1853)	100

TABLE 9. Interest of Administrator, Medical and Nursing Staffs in Working with Chief Pharmacist to Improve Quality of Pharmacy Service

Degree of Interest	Percent		
	Administrator	Medical Staff	Nursing Staff
Interested	92	79	85
Indifferent	5	13	10
Not interested	2	6	4
No answer	1	2	1

1853 Hospitals reporting.

TABLE 10. How Chief Pharmacists Rate Working Relationship Between Pharmacy and Other Hospital Departments

Department	Rating (Percent)			
	Very Good to Good	Fair	Not Too Good to Very Poor	No Answer
Administration	94	4	1	1
Medical staff	85	10	3	2
Nursing department	88	10	1	1
Business office	91	5	1	3
Purchasing agent	81	5	2	12
Other hospital departments	91	4	<1	5

1853 Hospitals reporting.

in helping to improve pharmacy service (Table 9, Q 7a). There appears to be a significant difference in the attitude of the professional staffs, represented by medicine and nursing, and that of the administrative staff. This is not surprising. Administrators, by the very nature of their work, must take an interest in each department and by encouragement and other means help the department head to improve the quality of service and interrelationships with other departments. On the other hand, physicians and nurses have their own areas of professional responsibility which are usually so demanding in time that little if any is left to work with another department to help improve its service. Perhaps also a certain percentage of physicians and nurses consider it a part of their routine to adapt themselves to the quality of the ancillary services as they find them, rather than to take the time to participate in any upgrading program.

In rating working relationships between pharmacy and other departments, pharmacists judge that relationships are *good* to *very good* with 94 percent of administrators, 85 percent of the medical staffs, 88 percent of the nursing staffs, 91 percent of business office managers, 81 percent of purchasing agents, and 91 percent of other hospital department heads (Table 10, Q 7). If these groups are divided into those concerned primarily with administrative or management functions and those concerned with professional functions, we note that, in general, relationships with the professional groups representing medicine and nursing need greater strengthening. In the administrative or management category, relationships with the purchasing agent only are reported as relatively weak. This may be due to conflicts between the pharmacist and purchasing agent relative to specifications and sources of supply for pharmaceuticals. It may be due also to the lack of an administrative policy with a definite assignment of responsibility for this function, the lack of which discourages establishment of a healthy liaison.

When we correlate the findings relative to the administrator's attitude toward the objectives of the chief pharmacist, his interest in improving pharmacy service, his working relationships with pharmacy and his apparent respect for pharmacy (Tables 7, 8, 9, 10) —we find that these four "feelings" go hand in hand and are highly positive as shown in Figure 2. This indicates, in general, that hospital pharmacists enjoy a favorable administrative relationship which operates in a climate that is conducive to professional growth and the improvement of pharmacy services.

The same general correlation exists when we analyze the findings relative to pharmacists' feelings concerning the attitude of the medical and nursing staffs toward the pharmacy. These attitudes are reflected in Figure 3 and are seen to be highly positive.

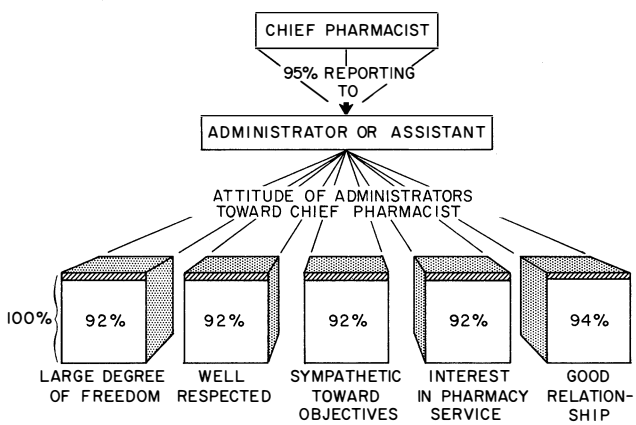
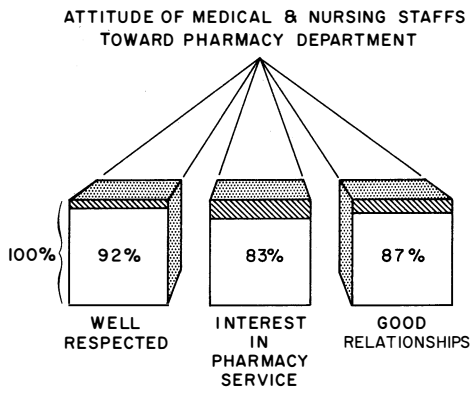


FIGURE 2. Attitude of Administrators Toward Chief Pharmacists

FIGURE 3. Attitude of Medical and Nursing Staffs Toward Pharmacy Department



RECOMMENDATIONS

5.1 Organizational Line of Responsibility. It is recommended that the organizational line of responsibility of the chief pharmacist for the management of the pharmacy department lead directly to the administrator of the hospital or to one of his immediate professionally oriented assistants.

5.2 Degree of Freedom. It is recommended that chief pharmacists take greater advantage of their degree of freedom and of the cooperative attitudes existing in hospitals to plan and present dynamic, progressive, and imaginative programs for the improvement of pharmacy service which will, at the same time, improve the attitude of the professional staffs toward the pharmacy.

3

FACILITIES

3.1 Location

About 8 out of 10 pharmacists rate the location of their pharmacies as convenient for providing service to nursing units, operating suites, laboratories, and to the medical staffs. In contrast, only about 6 out of 10 pharmacists agree that the location of their departments is convenient for providing service to outpatients and outpatient clinics (Figure 4, Q 41). This suggests that planning of hospital pharmacies has not kept pace with the expansion of general outpatient facilities in hospitals.

Relative to the location of the pharmacy department, Milne and Taylor have stated:*

> In hospitals of less than 200 beds the pharmacy should be located on the first floor, in the center of the activities it is called upon to service frequently, easily accessible to the elevator, and near or adjoining the outpatient department, if such is maintained by the hospital. This will provide the most efficient service and conserve manhours of work.
>
> Though it is recommended that the pharmacy be all located on one floor, it may be varied in larger hospitals when first floor space is at a premium.
>
> The basement is not desirable for a pharmacy.

Through a supplementary questionnaire it was found that 9 hospitals out of 10 combine inpatient and outpatient prescription service in the same general area of the pharmacy. Some hospitals, however, maintain an outpatient pharmacy which is separated physically from the inpatient service. About one-third of hospitals with 500 or more beds have a separate outpatient pharmacy unit (Table 11).

Deficiences in the location of pharmacies for providing both inpatient and outpatient services are significant enough to indicate need for better planning of placement of pharmacy facilities. Only slightly more than half of hospital pharmacies are in a location convenient to give service to outpatients. Since 9 out of 10 hospital pharmacies serving clinic patients combine inpatient and outpatient pharmacy service, it is obvious that a significant number of pharmacists feel that this combined department is poorly located in relation to service to outpatients.

If a hospital provides outpatient pharmacy service then, if possible, pharmacy facilities should be located either in or immediately adjacent to the outpatient department. It is not suitable for a cashier, nurse or other hospital personnel to accept the prescription from the patient and send it by pneumatic tube or by other means to the pharmacy located in some other section of the hospital and return the medication to this person for delivery to the patient. Although

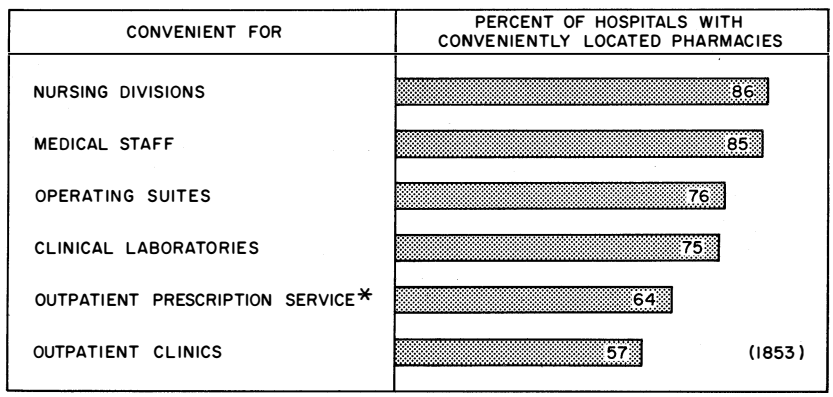


FIGURE 4. Convenience of Location of Pharmacy

* Percentage is of those hospitals which do furnish outpatient prescription service.

TABLE 11. Location of Outpatient Pharmacy Service in Hospitals with Pharmacists

Bed Capacity	Location of Outpatient Pharmacy	
	Combined In- and Out-patient Area (Percent)	Outpatient Clinic (Percent)
Short-term		
Under 50	93	7
50–99	90	10
100–199	98	2
200–299	94	6
300–399	93	7
400–499	87	13
500 and over	69	31
Long-term		
All sizes	87	13
Average	89	11

manhours may be conserved by combining inpatient and outpatient dispensing units, this advantage should not take precedence over locating the outpatient pharmacy facility in the immediate area serving outpatients. If a low volume of work does not justify such a location, then it would seem best either to not offer outpatient pharmacy service or to have the patient carry his prescription to the inpatient pharmacy.

Fewer deficiencies exist in the location of pharmacies for providing inpatient services. The complex nature of hospital services in general makes it virtually impossible to build a hospital in which all departments are ideally located. Ideally, space for all pharmacy functions should be contiguous, with the possible exception of those for bulk storage and for outpatient service. When these latter functions are separated from the main pharmacy there should be either a close horizontal or a direct vertical relationship if possible. It is highly desirable that the inpatient pharmacy unit be connected vertically with nursing divisions, operating room suites, and similar units. If the pharmacy and central supply, purchasing or other hospital function are integrated, then they should be located adjacent to one another. It is also desirable for the pharmacy to be located in an area where it is convenient for physicians and other professional personnel to come to the department for drug information.

3.2 Floor Space

The United States Public Health Service, in its publication, "Suggested Plans for Hospital Pharmacies for 50, 100, and 200 Bed General Hospitals,"* has recommended the following floor space and the distribution of this space in the following areas:

Area Distribution for General Hospital Pharmacies

Areas in Square Feet	50 Bed	100 Bed	200 Bed
Compounding and dispensing laboratory	205	320	495
Parenteral solution laboratory	—	185	200
Active storeroom	—	125	200
Manufacturing laboratory	—	—	120
Office and library	—	—	105
Circulation	—	—	60
Total	205	630	1180

These areas are net areas and do not include walls, supporting columns, service utilities areas, and partitions. Areas designated "Compounding and Dispensing Laboratory" provide space for both inpatient and outpatient prescription service, with no separate area for outpatient service. Additional storage space of approximately 170 square feet per 100 beds is provided for bulk pharmacy stores in an area directly beneath the pharmacy and separate from central stores.

In general, the amount of floor space recommended in the Public Health Service plans for a 100 bed hospital may be considered applicable for a 75 to 150 bed hospital while the amount of space recommended for a 200 bed hospital is usually adequate for a hospital with 150 to 250 beds. It must be borne in mind that the Public Health Service recommendations were drafted prior to 1950. Since then, the tempo of pharmacy activities has greatly increased; use of outpatient pharmacy services has grown; there is greater utilization of diagnostic, therapeutic, and investigational drugs and other preparations by the larger clinical laboratories and research programs; many additional drugs and chemicals have been introduced, all of which require additional storage space, additional filing facilities for drug literature, and, in some instances, additional manufacturing facilities. Thus, the recommendations of the Public Health Service for floor space in hospital pharmacies should be considered minimal for new planning today. In fact, further study may show them to be deficient in view of today's needs.

It will be noted that the number of square feet per bed recommended by the Public Health Service is as follows:

Size of Hospital in Beds	*Square Feet per Bed for Pharmacy Facilities*	*Square Feet per Bed without Parenteral Solutions Laboratory*
50	4.0	4.0
100	6.3	4.45
200	5.9	4.9

The average floor space per bed in short-term hospitals is shown in Table 12. This table includes the present *average* floor space in square feet per bed for the pharmacy in 1406 hospitals in which the func-

* Milne, A. M. and Taylor, W. R.: Suggested Plans for Hospital Pharmacies, 50, 100 and 200 Bed General Hospitals, *Bull. Am. Soc. Hosp. Pharm.* 7:122 (May-June). 1950.

TABLE 12. Average Pharmacy Floor Space per Bed in Short-Term Hospitals

Bed Capacity	Number of Hospitals Reporting	Space per Bed in Square Feet		
		Present	Additional Needed	Total (Present Plus Additional)
Under 50	48	13.0	7.0	20.0
50–99	156	6.5	3.0	9.5
100–199	546	4.0	2.7	6.7
200–299	363	3.9	3.2	7.1
300–399	198	3.8	2.5	6.3
400–499	95	3.4	1.9	5.3

1406 Hospitals reporting.

tions of the pharmacy vary and, further, cannot be related to floor space allotments based on function because respondents failed to specify this information. In general, it will be noted that the amount of available floor space in hospitals with 100 or more beds is low when compared with Public Health Service recommendations. For example, hospitals with 100–199 beds have 4 square feet of floor space per bed while the Public Health Service recommends from 4.45 to 6.3 square feet. One may question, however, whether the 4.45 figure, obtained by eliminating the parenteral solution laboratory from the pharmacy, is realistic in today's hospital. It would appear that every pharmacy giving a professional service should have an aseptic or sterile room for dilution of antibiotics, preparation of sterile eye solutions, reconstitution of investigational and other drugs, and other extemporaneous compounding of sterile medication and their control, regardless of whether large volume parenteral solutions or other sterile solutions are prepared.

It will also be noted from Table 12 that hospitals with from 200 to 499 beds have even less floor space, from 3.4 to 3.9 square feet per bed which appears to be drastically below minimum requirements for proper pharmaceutical service as suggested by the Public Health Service.

Noteworthy also is the great variation in the amount of floor space devoted to pharmacy service in hospitals of the same size and type. For example, a range of from less than 100 square feet to more than 5000 square feet was reported as the present floor space in short-term, general, and special hospitals with 200–299 beds. Similar ranges were noted in hospitals of other sizes.

It is not surprising that hospitals with less than 50 beds and those with between 50–99 beds report a comparatively large number of square feet of floor space, 13 square feet and 6.5 square feet per bed, respectively. A certain minimum space is necessary for the establishment of a pharmacy and, of course, in a hospital with a small number of beds the area, when calculated in square feet per bed, is larger and appears out of proportion when contrasted with the space in hospitals having a larger number of beds. At the level of 50–99 beds, this exaggeration seems minimal.

3.3 Estimations of Additional Space Needed

Hospital pharmacists were asked to indicate the number of additional square feet of space they felt would be necessary for them to give the type of service the pharmacy should provide. These figures are shown also in Table 12. When the present space for hospitals with 100–199 beds is added to the amount of additional space needed, the result is 6.7 square feet per bed, or just slightly above the recommendations of the Public Health Service. This is probably a reasonably good approximation of actual needs because the question (Q 42) was phrased in such a manner as to force the respondent to answer in terms of his estimated needs according to function, *e.g.*, area required for (1) compounding and dispensing, (2) parenteral solutions laboratory, (3) storage area for pharmaceutical stock, (4) manufacturing laboratory, (5) office and library area, and (6) other. Thus, the results of this survey tend to validate the recommendations of the Public Health Service for the amount of floor space required for pharmacy service and, at the same time, show them to be minimal.

A closer approximation of floor space required based on functions performed may be obtained by comparing the recommendations of the Public Health Service and the survey findings of the average floor space in square feet per bed in short-term hospitals of 100 to 200 beds *which reported space for the functions shown* in Table 13. Here we see that the average number of square feet per bed is 8.12, as found in the survey, in contrast to 6.3 square feet per bed for a 100 bed hospital or 5.9 square feet per bed for a 200 bed hospital as recommended by the Public Health Service. Of course, this comparison has its limitations and one cannot say that a direct relationship exists between the two sets of figures because of the different methods of obtaining them and for other reasons. For example, the survey findings show less space for compounding and dispensing than is provided by the Public Health Service recommendations. On the other hand, the survey findings provide more space for "circulation or other" than do the Public Health Service recommendations. This tends to compensate for the lack of space specifically assigned to compounding and dispensing. Also, the larger area for storage in the survey findings may be accounted for, at least partially, by the fact that the Public Health Service recommendations provide additional areas, not shown in the table, approximately 170 square feet per 100 beds, for storage of bulk pharmaceuticals outside of the pharmacy. It is noteworthy that the space for the parenteral solutions laboratory for 200 bed hospitals in the survey findings averages over 300 square feet while the recommendations of the Public Health Service are 200 square feet. The survey findings and the recommendations of the Public Health Service for parenteral solutions laboratories in 100 bed hospitals are much closer. The office and library space in 200 bed hospitals is not as large as that recommended by the Public Health Service.

TABLE 13. Comparison of Public Health Service Recommendations and Average Floor Space per Bed in Short-Term Hospitals Which Have Space for the Following Functions

Functions	Area in Square Feet					
	Public Health Service Recommendations		Survey Findings[2]			
	100 Beds	200 Beds	100 Beds	200 Beds	300 Beds	400 Beds
Compounding and dispensing	320	495	174	306	393	452
Parenteral solutions laboratory	185	200	149	304	270	420
Active storage[1]	125	200	206	334	310	528
Manufacturing laboratory	—	120	120	156	210	292
Office and library	—	105	44	74	135	116
Circulation (or other)	—	60	119	150	144	192
Total area	630	1180	812	1324	1617	2000
Total square feet per bed	6.3	5.9	8.12	6.62	5.39	5.0

[1] Public Health Service plans provide additional areas for reserve storage of bulk pharmaceuticals outside of the pharmacy, approximately 170 square feet per 100 beds.
[2] These respondents indicated the need for additional space but this is not included in these tabulations.

It is significant that the amount of floor space for 100 and 200 bed hospitals as found in the survey for hospitals having space allocated to the functions specified in Table 13, and the total of the present space and the additional space needed as shown in Table 12, both exceed the amount of space recommended by the Public Health Service for hospitals with 100 and 200 beds.

These findings suggest that the total floor area required for pharmacies in 100 and 200 bed hospitals performing the functions stated in Table 13 is now more than was recommended by the Public Health Service several years ago. In this connection, the most significant figures in Table 13 are the totals because the total number of existing square feet could be fairly accurately determined by the respondents, whereas methods of dividing up the total and assigning space to certain functions is subject to great variation.

The survey findings in floor space in square feet per bed for 300 and 400 bed hospitals having areas devoted to compounding and dispensing, parenteral solution laboratory, storage, manufacturing, office and library, and other uses are shown also in Table 13. Here we note that *average* existing space for pharmacies in this group of 300 bed hospitals is 1617 square feet while in the 400 bed hospitals, the space is 2000 square feet.

Of course, it must be emphasized that these figures are only averages and signify nothing more than a general yardstick. Nevertheless, they are enlightening when used to compare the actual situation existing in hospitals relative to allotment of floor space. For example, the median pharmacy floor space in square feet in all short-term hospitals according to bed capacity is shown in Table 14. Here we note that at least half the pharmacies in each bed category are grossly deficient in floor space even when compared with the recommendations of the Public Health Service and are far more deficient when compared with the findings in Table 13, as summarized above. Even when the median present space and the median additional space noted in Table 14 are totaled, the result is still significantly below the totals shown in Table 13. For example, Table 13 shows that a pharmacy in a 300 bed hospital performing the functions listed, has 5.39 square feet per bed, or a total of 1617 square feet. In contrast, Table 14 shows that the median floor space of pharmacies in hospitals with 300–399 beds is only 947 square feet and that even the addition of a median of 518 square feet, estimated to be needed, would yield but 1465 square feet, a figure still below 1617 square feet.

3.4 Space in Hospitals Above 200 Beds

Present pharmacy floor space allotments in hospitals with 200 beds and over are extremely low. Over half the hospitals in this group have less, and some have far less, than the 1180 square feet recommended for a 200 bed hospital. This is true even in the case of short-term hospitals with up to 500 beds. The group of hospitals with 500 or more beds includes many hospitals with 700, 800, or 1000 beds and over. When one considers that these large hospitals have a median of only 1750 square feet of floor space, which is little more than the Public Health Service recommendation for a 200 bed hospital, the implications of this great variation become sharply apparent.

TABLE 14. Median Pharmacy Floor Space in Short-Term Hospitals

Bed Capacity	Median Floor Space in Square Feet		
	Present Space	Additional Space Needed	Total Present and Additional
Under 50	350	25	375
50–99	338	83	421
100–199	449	376	825
200–299	797	442	1239
300–399	947	518	1465
400–499	1172	500	1672
500 and over	1750	1000	2750

1406 Hospitals reporting.

TABLE 15. Pharmacy Departments in Short-Term Hospitals Which Do Not Have Floor Space for the Following Activities

Bed Capacity	Percent			
	Parenteral Laboratory	Storage	Manufacturing Laboratory	Office and Library
Under 50	93	18	21	56
50–99	69	11	57	35
100–199	67	8	60	35
200–299	67	5	53	31
300–399	65	5	40	22
400–499	63	7	36	25
500 and over	55	6	22	12

1406 Hospitals reporting.

A significant percentage of pharmacies do not have floor space for a parenteral solutions laboratory, a manufacturing laboratory and, to a lesser degree, office and library space and space for storage (Table 15, Q 42). Considering only hospitals with 100 or more beds, those which have a high percentage of pharmacists on a full-time basis, it appears that only about 1 in 3 has space for a parenteral solutions laboratory and that only about 1 in 2 has space for manufacturing activities. On the other hand, space for office and library facilities is provided in the majority of hospitals and in 3 out of 4 pharmacies in hospitals with more than 300 beds. Storage space is available in about 9 out of 10 pharmacies.

Storage space and facilities for handling special drugs as narcotics and alcohol are reported adequate in almost 9 out of 10 hospitals (Figure 5, Q 43). However, storage space and facilities for drugs requiring refrigeration and for flammable and volatile chemicals are adequate in only about 3 hospitals out of 4.

In view of the findings relative to floor space allotted to pharmacies, it is quite understandable that approximately 4 pharmacists out of 10 feel that their scope of pharmaceutical service is limited because of inadequate floor space, as well as inadequate personnel and facilities (Chapter VII). It is apparent that the allotment of adequate, properly located floor space is one of the greatest needs for the hospital pharmacy if it is to function properly.

To obviate the encroachment on space otherwise allotted for essential functions, the pharmacy should include in its space requirement at least a modest allotment for investigation or research. Frequently there are problems, both for immediate and less urgent attention, which require isolated work, and their solution in the pharmacy quarters, but separate from routine activities, is both logical and convenient. Work in connection with investigational drugs can be facilitated and actions to solve unusual problems can be stimulated if there is specific assignment of space for concentration on fundamental or applied research on new drugs or development of special dosage forms.

3.5 Equipment

Generally speaking, hospital pharmacies are reported as not equipped adequately to provide a broad range of pharmaceutical services (Figure 6, Q 46). Most pharmacies, 9 out of 10, are well enough equipped to provide compounding and dispensing activities. Approximately 3 out of 4 have sufficient equipment to carry out office procedures and to provide a library reference service. In contrast, only 1 in 3 has adequate equipment for manufacturing or bulk compounding, for product formulation or product development. Only about 1 pharmacy in 10 is equipped to prepare sterile products or to perform control procedures such as assay, sterility testing, etc.

No attempt was made in this survey to determine the items of equipment available to hospital pharmacists to carry out their functions. Rather, the responses indicate only the opinion of chief pharmacists as to the adequacy of their equipment. Under such circumstances it is entirely possible, and quite probable in many instances, that many respondents are not sufficiently familiar with the various types of equipment available to enable them to give a fully meaningful answer to question 46. It would be helpful to hospital pharmacists if a study were made of present-day equipment necessary or highly desirable to carry out the functions of the pharmacy to provide a broad range of professional service.

3.6 Office and Library Facilities

Office and library facilities are completely lacking in a significant number of hospitals (Table 15, Q 42).

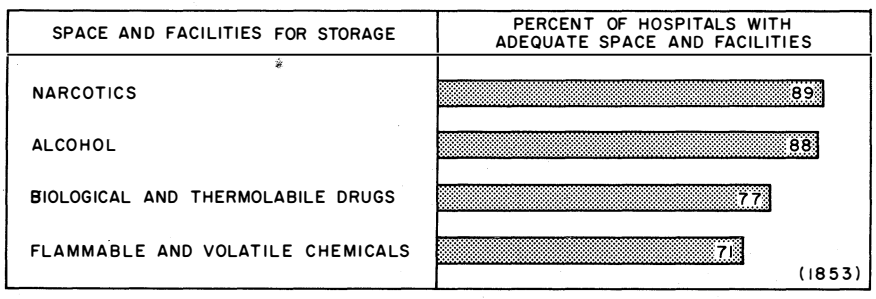


FIGURE 5. Adequacy of Special Storage Space and Facilities

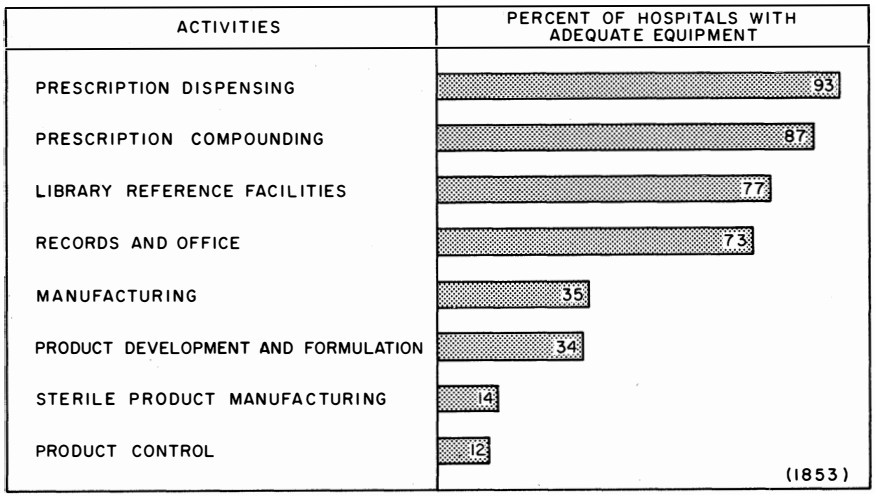


FIGURE 6. Adequacy of Present Equipment for Carrying Out Certain Pharmacy Activities

No such facilities are available in about 1 out of 3 hospitals with between 100 and 299 beds and in about 1 out of 4 hospitals with between 300 and 499 beds. Only about 1 in 8 hospitals with more than 500 beds lacks these facilities.

Office and library facilities are in many respects as important as drugs for a chief pharmacist to function effectively as a department head and manager who is responsible for maintaining proper records, maintaining close liaison with administration, serving as a consultant to the medical, nursing, and allied staffs, and interviewing detailmen and others. Lack of such basic facilities is a detriment to good management and good professional service.

3.7 Space and Equipment Related to Functions

The findings of this survey relative to deficiencies in space and equipment for hospital pharmacies suggest the need for hospital pharmacists and administrators to gain a better appreciation of the functions which should be assigned to the pharmacy department. It is obvious, for example, that more than 50 percent of the nation's pharmacies in hospitals with 200 or more beds, including more than 500 hospitals with from 300 to more than 500 beds, do not have the space or equipment recommended by the Public Health Service for the pharmacy in a 200 bed hospital. This is also true of hospitals with 100 beds. It is likewise true that a need has been shown for more space than has been recommended by the Public Health Service in those hospitals which *do have* the functions of compounding and dispensing, parenteral solution preparation, storage, manufacturing, the maintenance of records and providing a drug information service.

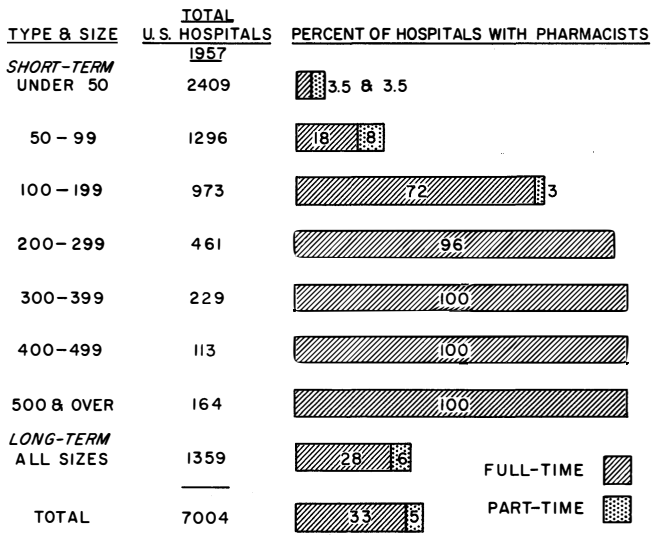
While we use bed size as a convenient yardstick for recommending floor space, it must be recognized that this results only in an approximation. A truer picture of need for space and equipment can be obtained by a study of functions performed and the frequency of these activities, or workload. When the profession as a whole accepts certain functions as being necessary and basic to good pharmaceutical practice, these functions will serve as a more satisfactory basis for determining needs for space and equipment. Thus, we may say that a careful determination of the functions of a department will regulate the space to be allocated, the equipment necessary to carry out the functions, and the number of personnel required to utilize the equipment and to render a given volume of service. All of these, of course, are related also to the frequency or intensity of each function or activity. For example, a hospital pharmacy filling 25 outpatient prescriptions daily will have far different needs for space, equipment, and personnel than will a pharmacy filling 250 outpatient prescriptions a day. This is true despite the fact that certain basic equipment will be necessary for each pharmacy. Or, a pharmacy which is able, as one of its functions, to supply sterile medication such as eye solutions or solutions for wet dressings or sterile extemporaneous preparations, will require basic equipment and a certain amount of well designed floor space to carry out these functions.

Failure of many practicing hospital pharmacists to accept responsibility for certain basic pharmaceutical services essential to better patient care is related to long established and deeply ingrained patterns of practice in American pharmacy. Too often, the role of the pharmacist is conceived principally as one of dispensing. The most effective means of bringing about a more universal acceptance of what constitutes the essential functions of a hospital pharmacist is for the professional organizations to spearhead special demonstration projects in this area.

RECOMMENDATIONS

5.3 Study Commission on Planning. It is recommended that a study commission be established to work with experts in the field of planning, automation, designing, and equipping hospital pharmacy facilities and that this com-

FIGURE 7. Hospitals Employing Pharmacists, Continental United States 1957



mission be requested to study hospital pharmacy and related functions and to recommend the location and space which should be allotted as well as the equipment, including automated devices, needed to carry out these functions, bearing in mind the working relationships within and outside of the pharmacy department, and further, that high priority be given this project.

5.4 U. S. Public Health Service Participation. It is recommended that the Division of Hospital and Medical Facilities of the U. S. Public Health Service be invited to participate in the work of the study commission mentioned in 5.3, and that the findings and recommendations of this commission form the basis for a series of suggested floor plans for pharmacies in hospitals of various size, where the functions and scope of service of the pharmacy vary, and that these floor plans be given wide distribution.

5.5 Demonstration Projects. It is recommended that a number of demonstration projects be developed to show the effect of well-designed and equipped hospital pharmacy facilities upon the quality, scope, and cost of pharmaceutical service for patients.

5.6 Plans for Improvement of Pharmacy Service. It is recommended that chief pharmacists study now the functions, facilities, and staffing pattern of their own departments and develop specific plans for improvement in light of present demands and opportunities for pharmacy service.

4

PERSONNEL

4.1 Hospitals Employing Pharmacists

Hospitals employing pharmacists may be divided into two main categories: short-term hospitals in which the average stay of the patient is 30 days or less and long-term hospitals in which the patient stay averages over 30 days. Short-term hospitals include the general, medical, and surgical institutions. Long-term hospitals are those which supply care for patients with chronic diseases, psychiatric conditions, tuberculosis, and other long-term illnesses. The number of hospitals in the continental United States with and without the services of a pharmacist in 1957 is shown in Figure 7 (Q 70). This graph was constructed from Table 16.

Approximately 86 percent of all short-term hospitals over 100 beds employed a pharmacist on a full-time or part-time basis in 1957. When the size of the short-term hospital reaches 200 beds or more, the percentage of hospitals which employ pharmacists rises sharply to 98 percent. All short-term hospitals with more than 300 beds have a full-time pharmacist on duty.

TABLE 16. Hospitals Employing Pharmacists, Continental United States 1957

Bed capacity	Total Number of Hospitals	Number of Hospitals Employing Pharmacists			Number of Hospitals without a Pharmacist	Percentage of Hospitals with a Pharmacist
		Full-Time	Part-Time	Total		
Short-term						
Under 50	2409	84	84[1]	168	2241	7
50–99	1296	231	102[2]	333	963	26
100–199	973	703	26[1]	729	244	75
200–299	461	444	0	444	17	96
300–399	229	228	0	228	1	100
400–499	113	113	0	113	0	100
500 and over	164	164	0	164	0	100
Subtotal	5645	1967	212	2179	3466	39
Long-term						
All sizes	1359	372	93[3]	465	894[4]	34
Total	7004	2339	305	2644	4360	38

[1] Nine hospitals receive services of pharmacist from another hospital.
[2] Three hospitals receive services of pharmacist from another hospital.
[3] Fifteen hospitals receive services of pharmacist from another hospital.
[4] Six hospitals stated that they handle no drugs.

On the other hand, only 2339 out of 7004 or about 33 percent of all hospitals have the services of a pharmacist on a full-time basis, while 2644 or 37.7 percent of hospitals have the services of a pharmacist on either a full-time or part-time basis.

Since the number of short-term hospitals in the 100–199 bed group (973) is approximately equivalent to the total number of short-term hospitals with more than 200 beds (967), the 100–199 bed group with only 75 percent having the services of a pharmacist, represents a large block of hospitals where the services of a pharmacist full-time could be reasonably justified. Thus, 244 hospitals in this category are without the services of a pharmacist, while only 18 hospitals with more than 200 beds do not have a pharmacist.

In short-term hospitals under 50 beds it will be noted that only 168 out of 2409, or 7 percent, employ a pharmacist and these are equally divided, with 84 employing a pharmacist full-time and an equal number employing a pharmacist on a part-time basis.

One out of 6 short-term hospitals in the 50–99 bed group has the full-time services of a pharmacist, while 1 out of 4 employs a pharmacist either part-time or full-time. It is interesting to note that, of those employing pharmacists, approximately 70 percent have a pharmacist on a full-time basis. It should prove valuable to study the characteristics of the short-term hospitals in the bed groups under 50 and between 50–99 which do find it possible to supply patients with the services of a pharmacist and to contrast these with the characteristics of a random sample of hospitals of the same range of bed capacity without the services of a pharmacist. This, however, must be the subject of a separate study.

About 1 out of 3 long-term hospitals employs a pharmacist. Of those which do, 80 percent have a pharmacist on a full-time basis. Thus, a significant percentage of long-term hospitals provide the services of a pharmacist and, of those which do, a high percentage employs a pharmacist on a full-time basis. An analysis should be made of long-term hospitals not employing a pharmacist.

From the findings presented, it would appear that a significant number of additional hospitals could use the services of a full-time pharmacist. For example, there are 262 general, short-term hospitals with between 100 and 399 beds which do not have the services of a pharmacist. Because of the high percentage of the hospitals in this size range which do employ a pharmacist, it may be reasonably assumed that essentially all of them could justify the services of a pharmacist full-time. This study, however, did not elicit reasons as to why these hospitals do not employ a pharmacist.

The number of beds in hospitals with the services of a pharmacist on a full-time basis and the number of beds in hospitals without the services of a pharmacist on a full-time basis are shown in Table 17. Here we note that greatest lack of full-time pharmacy services is in hospitals with less than 100 beds and in the long-term hospitals of all sizes. This table also emphasizes that less than half of the beds in American hospitals are covered by the services of a full-time pharmacist.

TABLE 17. Number of Beds in Hospitals with and without Full-Time Pharmacists 1957

Bed Capacity	Number of Beds in Hospitals with Full-Time Pharmacists	Number of Beds in Hospitals with No Full-Time Pharmacists	Total Beds
Short-term			
Under 50	2,334	64,347	66,681
50–99	15,437	72,772	88,209
100–199	105,516	39,225	144,741
200–299	102,005	3,919	105,924
300–399	70,298	283	70,581
400–499	45,518	0	45,518
500 and over	117,341	0	117,341
Long-term			
All sizes	213,048	571,569	784,617
Total	671,497	752,115	1,423,612

4.2 Pharmacists and Other Personnel

A total of 5833 pharmacists were employed in all the nation's hospitals in 1957. Of these, 4845 were employed full-time and 988 were on a part-time basis (Figure 8, and Table 18, Q 1 and 2). As may be seen from Table 18, roughly 1000 pharmacists are employed in each of five categories of hospitals; those general, short-term hospitals with 100–199 beds, with 200–299 beds, with 300–499 beds, those with 500 or more beds, and in long-term hospitals of all sizes. The total number of hospitals represented in these five groups is 3309. In contrast, only 611 pharmacists are employed in 3705 short-term hospitals with less than 100 beds.

If both the long-term hospitals and the short-term hospitals with less than 100 beds are eliminated from

FIGURE 8. Number of Pharmacists and Non-Pharmacists

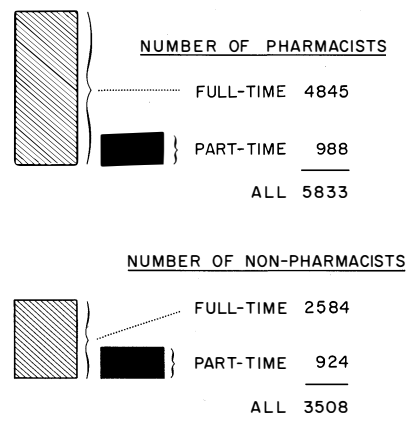


TABLE 18. Number of Pharmacists and Other Personnel Employed in Hospital Pharmacies, Continental United States 1957

Bed Capacity	Pharmacists			Other Personnel[1]		
	Full-Time	Part-Time	Total	Full-Time	Part-Time	Total
Short-term						
Under 50	90	93	183	18	3	21
50–99	284	144	428	93	45	138
100–199	954	208	1162	403	329	732
200–299	845	196	1041	570	217	787
300–399	602	96	698	383	105	488
400–499	390	45	435	231	34	265
500 and over	915	85	1000	685	110	795
Subtotal	4080	867	4947	2383	843	3226
Long-term						
All sizes	765	121	886	201	81	282
Total	4845	988	5833	2584	924	3508

[1] Does not include personnel employed in the pharmacy or drug room of hospitals which do not employ pharmacists. For this data see Chapter X.

consideration, we find that 87.6 percent of the hospital pharmacists are employed by 34.4 percent of the hospitals. Almost an insignificant number (27) of hospitals receive services from the pharmacist of another hospital.

Other personnel employed in the pharmacies of hospitals having the services of a pharmacist total 3508 (Table 18). Of these, 2584 are on a full-time and 924 are on a part-time basis. If we consider only those short-term hospitals with more than 100 beds, we find that the ratio of pharmacists to other personnel is about 10 to 7. In contrast, in short-term hospitals with less than 100 beds and in long-term hospitals the ratio of pharmacists to other personnel is about 10 to 3, when the two groups are combined.

The overall national staffing pattern for full-time pharmacists in short-term and long-term hospitals according to bed capacity is shown in Figure 9. It must be emphasized that this is the staffing pattern for hospitals which employ full-time pharmacists. For example, of the short-term hospitals under 50 beds which employ a full-time pharmacist, 88 percent employ 1, while 12 percent employ 2 pharmacists. Employment of full-time pharmacists in hospitals with less than 100 beds, however, is the exception rather than the rule. It is otherwise in short-term hospitals with 100 beds and over.

It will be noted that the percentage of hospitals employing only 1 full-time pharmacist decreases as the size of the hospitals increases. Thus, 73 percent of hospitals with 100–199 beds employ but 1 pharmacist, while only 42 percent of hospitals with 200–299 beds and 14 percent of hospitals with 300–399 beds employ 1 pharmacist, and so forth. In hospitals with 500 beds and over, more than 50 percent employ 5 or more full-time pharmacists.

A good picture of the staffing pattern for full-time pharmacists in hospitals according to bed capacity and by geographical regions is shown by Table 19. See Figure 1 (Chapter IV) for listing of states by geographical regions. As can be seen, there is a marked variation in the number of pharmacists employed full-time in each size category. This variation is marked within geographical regions and also when the staffing pattern in one region is compared with others. As a general pattern, not without exceptions, the range of the number of full-time pharmacists employed appears to be greater as we proceed west from the Atlantic seaboard. This may be related to the population growth of these regions and the number of new hospitals built and the absence of more rigid concepts of staffing the pharmacy department. While this survey does not have enough specific information to justify a particular staffing pattern, the existence of this variation undoubtedly has great significance which must be taken into account in future manpower studies. In other words, it would appear that the figures for the usual staffing pattern for hospital pharmacies would have to be adjusted upward in order to estimate future manpower needs more accurately.

A generally similar, but not as marked, pattern to that noted above is seen in Table 20 which shows the range of the staffing pattern for full-time personnel other than pharmacists. It is significant that a fairly large percentage of hospitals of all sizes do not have even one nonprofessional helper in the pharmacy to assist the pharmacist. This could be an important factor in limiting the scope of professional service the pharmacist is able to contribute by, in effect, forcing him to perform a large number of nonprofessional tasks which could be handled by lay personnel and thus preventing him from devoting more of his time and energy to improving and expanding pharmaceutical services.

FIGURE 9. Staffing Pattern of Full-Time Pharmacists in Hospitals

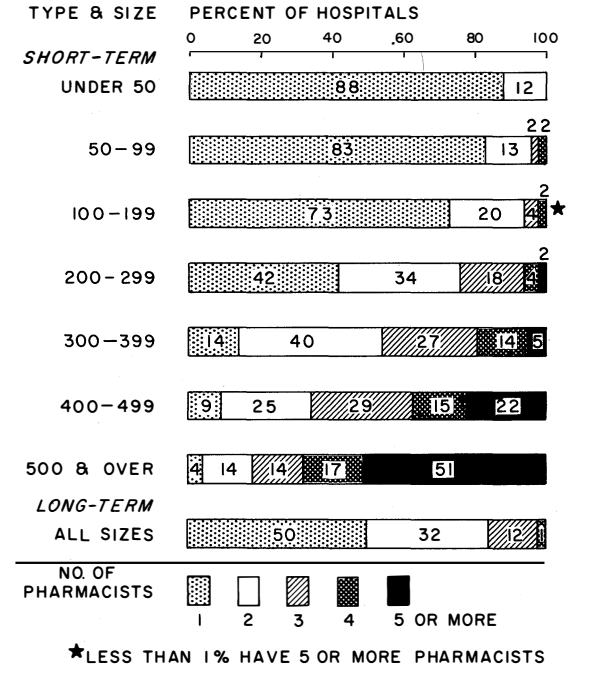


TABLE 19. Staffing Pattern of Pharmacists in Short-Term Hospitals According to Geographical Regions

Bed Capacity	Region	Percent of Hospitals Reporting Number of Full-Time Pharmacists											Part-Time Pharmacists						
		1	2	3	4	5	6	7	8	9	10	>10[1]	1	2	3	4	5	>5[2]	None
100–199	New England	73	22	5	—	—	—	—	—	—	—	—	28	—	—	—	—	—	72
	Mid-Atlantic	81	18	1	—	—	—	—	—	—	—	—	19	4	1	—	—	—	76
	South Atlantic	74	16	4	6	—	—	—	—	—	—	—	11	3	2	—	—	—	84
	East N. Central	77	16	5	2	—	—	—	—	—	—	—	19	3	1	—	—	—	77
	East S. Central	64	32	4	—	—	—	—	—	—	—	—	14	4	4	—	—	—	78
	West N. Central	73	23	2	1	1	—	—	—	—	—	—	16	3	—	—	—	—	81
	West S. Central	72	23	—	—	3	—	2	—	—	—	—	8	8	—	—	—	—	84
	Mountain	66	17	9	—	8	—	—	—	—	—	—	9	—	—	—	—	—	91
	Pacific	59	24	13	4	—	—	—	—	—	—	—	31	6	—	—	—	—	63
200–299	New England	28	28	38	6	—	—	—	—	—	—	—	32	—	5	—	—	—	63
	Mid-Atlantic	52	32	12	4	—	—	—	—	—	—	—	27	6	—	—	—	—	67
	South Atlantic	51	27	19	—	3	—	—	—	—	—	—	11	5	—	—	—	—	84
	East N. Central	44	36	15	5	—	—	—	—	—	—	—	25	6	1	—	—	—	68
	East S. Central	32	47	16	—	5	—	—	—	—	—	—	26	—	—	5	—	—	69
	West N. Central	40	35	22	—	—	3	—	—	—	—	—	24	8	3	—	—	—	65
	West S. Central	47	23	20	3	7	—	—	—	—	—	—	26	7	—	—	3	—	64
	Mountain	16	37	37	5	—	5	—	—	—	—	—	32	5	—	—	—	—	63
	Pacific	27	40	10	17	3	3	—	—	—	—	—	33	10	—	7	—	—	50
300–399	New England	—	44	38	12	—	—	—	—	—	6	—	13	—	—	—	—	—	87
	Mid-Atlantic	23	54	16	7	—	—	—	—	—	—	—	26	7	—	—	—	—	67
	South Atlantic	7	41	35	17	—	—	—	—	—	—	—	21	4	—	—	—	—	75
	East N. Central	17	46	28	5	2	2	—	—	—	—	—	7	4	4	2	—	—	80
	East S. Central	11	34	22	22	—	11	—	—	—	—	—	11	11	—	—	—	—	78
	West N. Central	—	41	47	12	—	—	—	—	—	—	—	24	6	6	—	—	—	64
	West S. Central	33	17	25	17	—	8	—	—	—	—	—	46	—	—	—	—	—	54
	Mountain	—	40	40	20	—	—	—	—	—	—	—	40	—	20	—	—	—	40
	Pacific	10	10	15	40	10	5	—	5	—	5	—	30	5	10	—	—	—	55
400–499	New England	20	20	40	20	—	—	—	—	—	—	—	40	—	—	—	—	—	60
	Mid-Atlantic	9	32	41	9	9	—	—	—	—	—	—	23	5	—	5	—	—	67
	South Atlantic	—	46	9	18	18	—	9	—	—	—	—	18	—	—	—	—	—	82
	East N. Central	—	8	42	33	9	—	8	—	—	—	—	17	—	8	8	—	—	67
	East S. Central	45	11	33	—	—	—	—	11	—	—	—	22	11	—	—	—	—	67
	West N. Central	11	22	23	22	11	11	—	—	—	—	—	44	—	—	—	—	—	56
	West S. Central	—	37	27	9	18	—	—	—	—	9	—	9	—	—	—	—	—	91
	Mountain	—	20	20	—	40	—	—	—	—	20	—	20	—	—	—	—	—	80
	Pacific	9	18	9	19	9	18	—	—	9	9	—	9	—	9	—	—	—	82
500 and over	New England	—	22	—	22	23	22	—	—	—	—	11	22	11	—	—	—	—	67
	Mid-Atlantic	3	—	13	13	26	16	10	6	—	—	13	13	7	3	—	—	—	77
	South Atlantic	—	13	6	25	13	13	6	6	6	6	6	13	6	6	—	—	—	75
	East N. Central	6	6	20	23	11	6	11	—	3	—	14	34	9	6	—	—	3	48
	East S. Central	—	25	—	25	25	—	—	—	—	—	25	—	—	—	—	—	—	100
	West N. Central	6	13	19	25	6	—	13	—	6	6	6	13	19	—	—	6	—	62
	West S. Central	8	38	8	—	8	15	15	—	8	—	—	8	8	8	—	—	—	76
	Mountain	—	50	50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	100
	Pacific	6	28	17	11	11	6	6	6	—	—	9	11	—	—	—	—	—	89

[1] Range is 11 to 27 full-time pharmacists.
[2] Range is 6 to 8 part-time pharmacists.

A total of 240 pharmacy interns were being trained in hospitals in 1957. Of these 149 were on a full-time basis while 91 were on a part-time basis. Other information relative to the training of hospital pharmacists is discussed in Chapter IX.

It is significant that in hospitals which have the services of full-time pharmacists, 210 nurses were reported as being employed in the pharmacy, with an equal number being employed on a full-time and on a part-time basis. More significant are the findings, discussed in Chapter X, which show that, in hospitals without pharmacists, 342 nurses are engaged full-time and 3324 are engaged part-time in pharmacy activities. Thus, close to 4000 nurses devote a significant portion of their time to pharmacy activities in American hospitals. In view of the critical shortage of nurses in hospitals throughout the nation, this appears to be a highly questionable utilization of nursing personnel. In addition, there are also professional and legal questions involved.

The average number of pharmacists and non-pharmacists employed in hospitals which do have an established pharmacy service are listed in Table 21. This table gives a clear indication of the average personnel staffing pattern of pharmacy departments in hospitals. It is well to emphasize that this is the average and that many hospital pharmacies exceed, and many are under, this average, as shown by Tables

TABLE 20. Staffing Pattern of Non-Pharmacists in Short-Term Hospitals According to Geographical Regions

Bed Capacity	Regions	Percent of Hospitals Reporting Number of Non-Pharmacists (Full-Time)										Non-Pharmacists (Part-Time)						
		1	2	3	4	5	6	7	8	>8[1]	None	1	2	3	4	5	>5[2]	None
100–199	New England	23	4	—	—	—	—	—	—	—	73	19	11	4	—	—	—	66
	Mid-Atlantic	35	6	1	—	—	—	—	—	—	58	24	8	2	—	—	—	66
	South Atlantic	32	8	3	2	3	—	—	—	1	51	27	2	2	—	—	—	69
	East N. Central	23	10	1	1	—	—	—	—	—	65	25	11	1	1	—	—	62
	East S. Central	32	14	4	—	—	—	—	—	—	50	29	7	—	—	—	—	64
	West N. Central	28	3	1	1	—	—	—	—	—	67	31	9	—	2	—	—	58
	West S. Central	21	13	3	8	—	—	3	—	—	55	15	5	—	—	—	—	80
	Mountain	26	6	—	—	—	—	—	—	—	68	20	9	6	—	—	—	65
	Pacific	27	9	2	—	2	—	—	—	—	60	22	9	—	2	—	—	67
200–299	New England	32	18	9	—	—	—	—	—	—	41	27	5	—	—	—	—	68
	Mid-Atlantic	56	10	5	1	—	—	—	—	—	28	30	6	1	—	—	—	63
	South Atlantic	50	16	5	3	—	—	—	—	8	18	21	8	—	—	3	—	68
	East N. Central	35	23	9	6	2	—	1	—	—	24	23	8	1	2	—	—	66
	East S. Central	32	26	11	11	—	5	5	—	—	10	16	11	—	—	—	—	73
	West N. Central	32	14	11	3	—	—	—	—	—	40	22	14	3	—	—	—	61
	West S. Central	39	13	6	—	3	—	3	—	—	36	13	13	3	—	—	—	71
	Mountain	53	—	5	—	—	—	—	—	—	42	5	11	—	—	—	—	84
	Pacific	27	23	—	—	—	3	—	—	—	47	27	13	3	—	—	—	57
300–399	New England	25	19	25	—	6	—	—	—	—	25	31	13	—	—	—	—	56
	Mid-Atlantic	44	33	5	2	2	—	—	—	—	14	21	5	—	—	—	—	74
	South Atlantic	31	14	10	10	10	—	3	—	—	22	7	3	7	—	—	—	83
	East N. Central	37	20	20	2	2	2	—	—	—	17	17	11	—	2	—	—	70
	East S. Central	22	22	22	—	11	—	—	—	—	23	22	—	11	11	—	—	56
	West N. Central	47	24	—	—	—	—	—	—	—	29	24	6	—	—	—	—	70
	West S. Central	15	8	15	—	8	8	—	—	—	46	15	15	8	—	—	—	62
	Mountain	—	60	20	—	—	—	—	—	—	20	20	—	—	—	—	—	80
	Pacific	40	15	20	5	5	—	—	—	5	10	30	15	—	—	—	—	55
400–499	New England	20	—	20	—	—	—	—	—	—	60	—	—	20	—	—	—	80
	Mid-Atlantic	45	23	14	5	5	—	—	—	—	8	18	—	—	—	—	—	82
	South Atlantic	18	18	9	—	—	—	9	9	—	37	9	9	—	—	—	—	82
	East N. Central	33	8	17	—	17	—	—	—	8	17	33	—	—	8	—	—	59
	East S. Central	11	22	11	—	11	11	—	11	—	23	11	—	11	—	—	—	78
	West N. Central	22	44	11	—	—	11	—	—	—	12	11	—	—	—	—	—	89
	West S. Central	27	27	9	—	9	9	—	—	—	19	—	—	—	—	—	—	100
	Mountain	20	20	20	20	—	—	—	—	—	20	—	—	—	—	—	—	100
	Pacific	36	27	9	—	9	—	—	—	—	19	9	18	—	—	—	—	73
500 and over	New England	33	11	11	11	—	11	—	—	11	12	33	11	—	11	—	—	45
	Mid-Atlantic	10	19	13	16	3	3	3	10	17	6	10	3	3	—	—	—	84
	South Atlantic	25	31	6	13	—	—	—	—	19	6	6	13	—	—	—	6	75
	East N. Central	11	9	9	26	3	17	11	6	5	3	17	9	3	6	3	—	62
	East S. Central	25	—	25	—	—	25	—	—	25	0	25	—	—	25	—	—	50
	West N. Central	38	13	13	6	—	—	6	—	6	18	19	6	—	6	—	13	56
	West S. Central	23	31	—	—	23	8	8	—	7	0	8	8	—	—	—	8	76
	Mountain	50	—	—	—	—	—	—	—	—	50	—	—	—	—	—	—	100
	Pacific	28	6	17	11	11	—	—	—	11	16	17	6	—	—	—	—	77

[1] Range of 9 to 29 full-time non-pharmacists.
[2] Range of 6 to 7 part-time non-pharmacists.

TABLE 21. Average Number of Personnel Employed in Hospital Pharmacies, Continental United States 1957

Bed Capacity	Pharmacists			Other Personnel		
	Full-Time	Part-Time	Total	Full-Time	Part-Time	Total
Short-term						
Under 50	1.1	1.7	2.8	1.2	1.0	2.2
50–99	1.2	1.3	2.5	1.8	1.3	3.1
100–199	1.4	1.2	2.6	1.5	1.4	2.9
200–299	1.9	1.3	3.2	1.8	1.4	3.2
300–399	2.6	1.4	4.0	2.1	1.5	3.6
400–499	3.5	1.5	5.0	2.6	1.6	4.2
500 and over	5.6	1.7	7.3	4.6	2.3	6.9
Long-term						
All sizes	2.0	1.4	3.4	1.5	1.2	2.7

19 and 20. We note also that the greatest variation about the average occurs in hospitals with 500 or more beds. Forty percent of the chief pharmacists state that they are unable to provide the scope of pharmacy service which should be rendered because of a lack of an adequate number of personnel (Chapter VII). The staffing pattern for full- and part-time pharmacists and non-pharmacists in short- and long-term hospitals reported with pharmacists according to bed capacity is summarized in Table 22.

The percent of hospitals with full-time pharmacists which do not employ pharmacists part-time or non-pharmacists either full-time or part-time is shown in Table 23. Thus, we note that 60 percent of hospitals

TABLE 22. Staffing Pattern of All Pharmacists and Non-Pharmacists in Hospitals Reported with Pharmacists 1957

Type of Personnel	Bed Capacity	Percent of Hospitals Reporting Number of Staff Personnel												Number of Hospitals Reporting
		1	2	3	4	5	6	7	8	9	10	>10[1]	None	
Pharmacist (full-time)	Under 50	88	12	—	—	—	—	—	—	—	—	—	—	48
	50–99	83	13	2	2	—	—	—	—	—	—	—	—	156
	100–199	73	20	4	2	<1	<1	—	—	—	—	—	—	546
	200–299	42	34	18	4	1	1	—	—	—	—	—	—	363
	300–399	14	40	27	14	2	2	—	<1	—	1	—	—	198
	400–499	9	25	29	15	12	3	2	1	1	3	—	—	95
	500 and over	4	14	14	17	15	10	9	3	3	1	10	—	144
	Long-term	50	32	12	1	—	1	—	1	—	—	3	—	303
Pharmacist (part-time)	Under 50	13	—	6	—	—	—	—	—	—	—	—	81	48
	50–99	13	2	2	—	—	—	—	—	—	—	—	83	156
	100–199	18	3	1	—	—	—	—	—	—	—	—	78	546
	200–299	25	6	1	1	<1	—	—	—	—	—	—	67	363
	300–399	21	5	3	1	—	—	—	—	—	—	—	70	198
	400–499	21	2	2	2	—	—	—	—	—	—	—	73	95
	500 and over	17	8	3	—	1	—	—	1	—	—	—	70	144
	Long-term		—	—	1	—	—	—	—	—	—	—	93	303
Other personnel (full-time)	Under 50	25	6	—	—	—	—	—	—	—	—	—	69	48
	50–99	17	10	2	2	2	—	—	—	—	—	—	67	156
	100–199	28	8	2	1	1	—	<1	—	—	—	—	60	546
	200–299	41	16	7	3	1	1	1	—	—	1	—	29	363
	300–399	35	22	14	3	5	1	<1	—	<1	—	—	20	198
	400–499	30	22	13	2	6	3	1	2	1	—	—	20	95
	500 and over	21	15	10	14	5	7	5	4	1	2	8	8	144
	Long-term	35	5	4	—	—	—	—	—	—	1	—	55	303
Other personnel (part-time)	Under 50	6	—	—	—	—	—	—	—	—	—	—	94	48
	50–99	17	6	—	—	—	—	—	—	—	—	—	77	156
	100–199	24	8	2	1	—	—	—	—	—	—	—	65	546
	200–299	23	9	1	1	—	<1	—	—	—	—	—	66	363
	300–399	20	8	2	1	—	—	—	—	—	—	—	69	198
	400–499	12	4	2	1	—	—	—	—	—	—	—	81	95
	500 and over	15	7	1	4	1	2	1	—	—	—	—	69	144
	Long-term	18	3	1	—	—	—	—	—	—	—	—	78	303

[1] Range is 11 to 36 persons.

with 100–199 beds do not employ a non-pharmacist either full-time or part-time to help the pharmacists. About 1 hospital in 5 with from 200 to 500 beds has no non-pharmacist personnel full-time. No part-time pharmacist is employed in about 7 out of 10 hospitals above 100 beds.

TABLE 23. Hospitals with Full-Time Pharmacists Which Do Not Employ Pharmacists Part-Time or Non-Pharmacists Full-Time or Part-Time

Bed Capacity	Hospitals[1] Reporting	Percent of Hospitals Reporting No Such Personnel		
		Pharmacists (Part-Time)	Non-Pharmacists (Full-Time)	Non-Pharmacists (Part-Time)
Short-term				
Under 50	48	81	69	94
50–99	156	83	67	77
100–199	546	78	60	65
200–299	363	67	29	66
300–399	198	70	20	69
400–499	95	73	20	81
500 and over	144	70	8	69
Long-term				
All sizes	363	93	55	78

[1] Hospitals with full-time pharmacists.

4.3 Hours of Work

Approximately 9 pharmacists in 10 are employed on the basis of 44 hours or less per week (Table 24, SQ 1). A majority work a 40-hour week. The number of hours worked per week varies with the size of

TABLE 24. Employment Hours per Week of Hospital Pharmacists

Bed Capacity	Total Hospitals Reporting	Percent of Hospitals Reporting Pharmacist's Hours per Week				
		Less than 40	40	44	48	More than 48
Short-term						
Under 50	48[1]	0	50	38	12	0
50–99	156[1]	8	43	24	10	15
100–199	404	7	55	21	7	10
200–299	363	4	66	18	6	6
300–399	198	4	71	18	5	2
400–499	95	6	75	14	4	1
500 and over	144	3	82	10	3	2
Long-term						
All sizes	282	10	75	11	2	2
Average	100	5	65	18	5	7

[1] Weighted by factor of 3.
1690 Hospitals reporting.

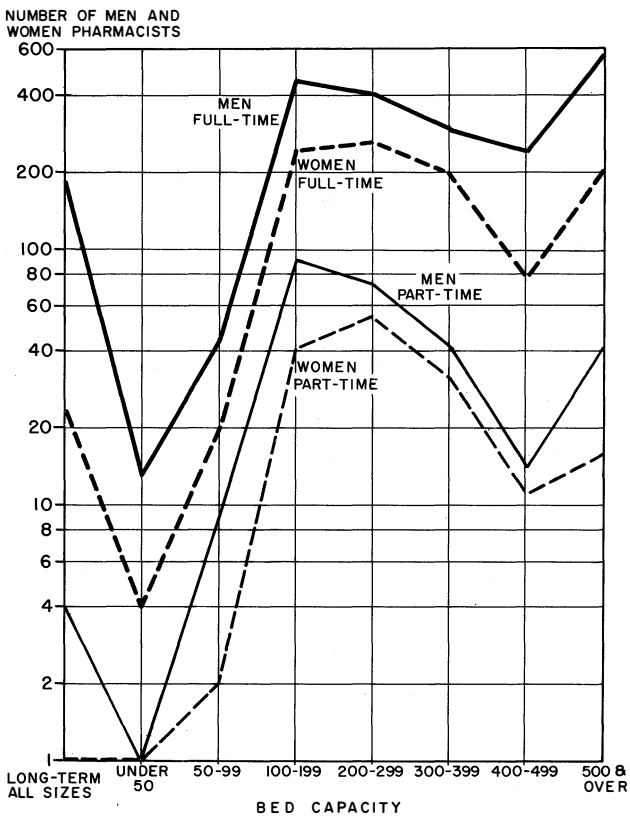
TABLE 25. Number of Men and Women Pharmacists Full-Time and Part-Time 1957

Bed Capacity	Total Hospitals with Pharmacists	Total Number of Pharmacists		Percent of Full-Time Pharmacists		Percent of Part-Time Pharmacists	
		Full-Time	Part-Time	Men	Women	Men	Women
Short-term							
Under 50	84	90	93	76	24	50	50
50–99	231	284	144	69	31	82	18
100–199	703	954	208	65	35	69	31
200–299	444	845	196	61	39	57	43
300–399	228	602	96	60	40	56	44
400–499	113	390	45	76	24	54	46
500 and over	164	915	85	74	26	72	28
Long-term							
All sizes	372	765	121	89	11	80	20
Total	2339	4845	988	—	—	—	—
Average	100	100	100	68	32	63	37

Includes members affiliated with religious orders.

the hospital. Pharmacists in the larger hospitals tend to work shorter hours than those employed in smaller hospitals. This probably is due, in a large measure, to variations in staffing patterns. In smaller hospitals in which there are only one or two pharmacists available to cover the entire week, there would be a tendency for pharmacists to work more than 40 hours a week. Pharmacists reporting a work-week of 48 or more hours were predominantly those who are members of religious orders. If the percentages were recalculated with this group removed, the results would show an even larger percentage of pharmacists to be working 44 hours or less per week.

FIGURE 10. Men and Women Pharmacists, Part-Time and Full-Time in Hospitals 1957



These findings indicate that hospital pharmacists generally, have satisfactory working hours, a factor which is important in attracting and retaining the services of pharmacists in hospitals. On the other hand, it must be remembered that community practitioners and other pharmacists tend, more and more, to work a 40-hour week and thus hospital pharmacy is losing rapidly its traditional advantage of shorter working hours.

4.4 Ratio of Men to Women

The ratio of men to women pharmacists in all hospitals is 2 to 1 (Table 25, Q 1). This is in sharp contrast with community pharmacy practice where the ratio of men to women pharmacists is over 9 to 1, according to the National Association of Boards of Pharmacy.

The number of men and women pharmacists employed full-time and part-time in hospitals according to bed capacity is shown in Figure 10. Here we note that in hospitals with 300 beds and above a relatively greater percentage of men pharmacists are employed.

The ratio of men to women who are *chief pharmacists* is about 2.6 to 1 (Table 26, SQ 3). A greater percentage of men are found as chief pharmacists in hospitals with less than 50 beds and those with 300 beds or more, while the larger percentage of women chief pharmacists serve in hospitals with from 50 to 299 beds. Dual positions, such as pharmacist combined with administrator, business manager, or purchasing agent, undoubtedly are factors in the employment of a higher percentage of men pharmacists in hospitals with less than 50 beds.

Of the women who are chief pharmacists, more than half are members of religious orders. The percentage of men pharmacists affiliated with religious orders is insignificant.

These findings indicate that women play an important role in staffing the nation's hospital pharmacies. The significantly higher percentage of women in hospitals as compared to community practice shows that women are strongly attracted toward hospital pharmacy.

TABLE 26. Sex of Chief Pharmacists and Affiliation with Religious Order

Bed Capacity	Sex of All Chief Pharmacists		Percent of Chief Pharmacists Who Are Members of Religious Orders		Sex of Chief Pharmacists Excluding Members of Religious Orders	
	Male (Percent)	Female (Percent)	Male (Percent)	Female (Percent)	Male (Percent)	Female (Percent)
Short-term						
Under 50	81	19	7	33	93	7
50–99	60	40	0	52	75	25
100–199	68	32	<1	58	83	17
200–299	68	32	<1	52	81	19
300–399	73	27	<1	57	87	13
400–499	79	21	0	70	93	7
500 and over	76	24	0	54	87	13
Long-term						
All sizes	88	12	0	45	93	7
Average	72	28	<1	56	85	15

While the ratio of men to women in hospital pharmacy practice is 2:1, the ratio of men to women chief pharmacists is approximately 3:1 and, exclusive of women who are members of religious orders, the ratio of men to women chief pharmacists is close to 6:1. We interpret these findings to indicate that men tend to seek a long-term career in hospital pharmacy while the career of women is more often interrupted or terminated by marriage and home responsibilities. This undoubtedly affects the turnover rate and manpower requirements for hospital pharmacy. In essence, the ratio of men to women chief pharmacists reflects the career patterns for pharmacists in hospitals.

Approximately 1000 pharmacists are employed on a part-time basis in hospitals. Here the ratio of men to women is 1.7 to 1. This slightly higher percentage of women working part-time may be attributed to women's dual position as housewife and breadwinner supplementing the family income.

4.5 Age and Years in Practice

Hospital pharmacy has a high percentage of young people who have been in practice a relatively short period of time (Figures 11, 12, and 13, Q 67 and 68). One in 3 hospital pharmacists is less than 30 years of age and has been in hospital practice for less than three years. One in 2 staff pharmacists is less than 30 years of age and has been in hospital practice for less than three years. Fifty-seven percent of all pharmacists employed in hospitals are under 40 years of age and have worked in hospitals less than six years. Among chief pharmacists, 43 percent are under 40 years of age and 33 percent have been in practice for less than six years. Many of these, of course, are the only pharmacist in the hospital. For the profession as a whole, only 49 percent of pharmacists are 44 years of age or younger.*

* United States Public Health Service: *Health Manpower Source Book* (Section 15) Pharmacists, February 1963, Table 3, p. 7.

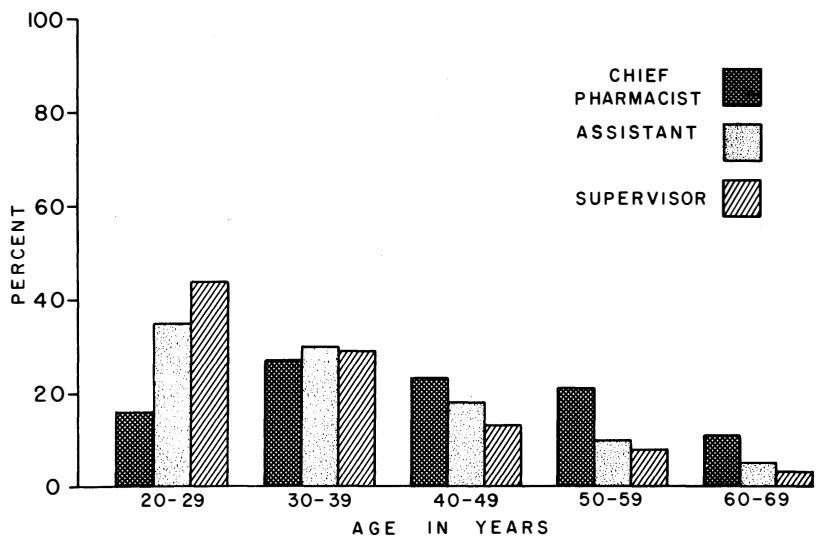


FIGURE 11. Age Distribution of Pharmacists: Chief, Assistant Chief, and Supervisor Pharmacists

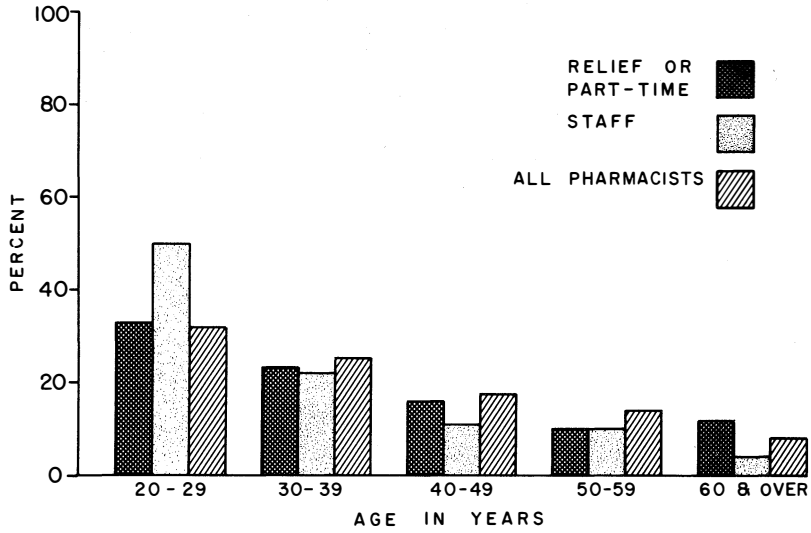


FIGURE 12. Age Distribution of Pharmacists: Relief or Part-Time, Staff and All Pharmacists

Advancement to chief pharmacist appears to come relatively rapidly and chief pharmacists continue in their position for a number of years. About 82 percent of all chief pharmacists are over 29 years of age and 65 percent of these have been in hospital practice for six years or more.

4.6 Professional Membership

The status of membership of hospital pharmacists in professional pharmacy organizations is shown in Table 27. Here we see that 64 percent of chief pharmacists hold membership in the American Pharmaceutical Association, while 56 percent are members of the American Society of Hospital Pharmacists. Fifty-one percent are members of one of the local chapters affiliated with the American Society of Hospital Pharmacists.

The attitude of chief pharmacists toward the contributions of the American Society of Hospital Pharmacists is shown in Table 28. Seventy-one percent show a positive attitude toward the Society's contribution indicating that it had contributed from a *very great extent* to *quite a bit.*

The record of hospital pharmacists holding membership in their professional organizations is good only in comparison with pharmacists in general. Two out of three belong to the American Pharmaceutical Association, while only 56 percent belong to the American Society of Hospital Pharmacists. Slightly more than 50 percent belong to a local chapter affiliated with the American Society of Hospital Pharmacists.

Membership in his national professional organizations is the hallmark of a professional man. The American Pharmaceutical Association and the American Society of Hospital Pharmacists should carry out coordinated, sustained membership campaigns in order to enlist the support of all hospital pharmacists to help achieve the goals toward which they are striving. The American Society of Hospital Pharmacists should create a category of membership which places more demands upon the individual to attain.

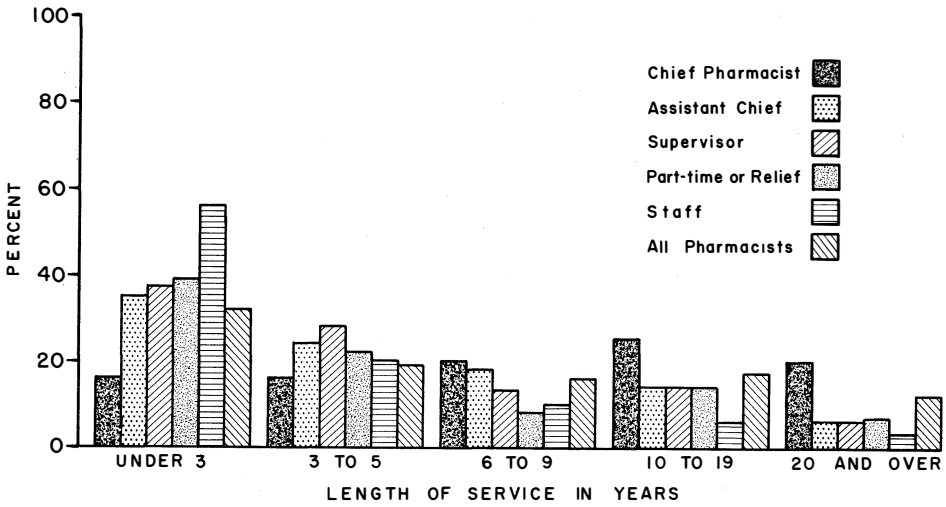


FIGURE 13. Length of Service of Pharmacists in All Sizes and Types of Hospitals

TABLE 27. Membership Status of Chief Pharmacists In Professional Organizations

Status	American Pharmaceutical Association		American Society of Hospital Pharmacists		ASHP Local Chapters	
	Number	Per-cent	Number	Per-cent	Number	Per-cent
Belong	(1192)	64	(1038)	56	(936)	51
Do not belong	(515)	28	(593)	32	(447)	24
No answer	(146)	8	(222)	12	(470)	25

1853 Chief pharmacists reporting.

TABLE 28. Chief Pharmacists' Attitude toward Contributions of American Society of Hospital Pharmacists to Hospital Pharmacy Practice

	Number	Percent
Very great extent to quite a bit	(1318)	71
Somewhat	(179)	10
A little to none	(59)	3
Don't know	(206)	11
No answer	(91)	5
	(1853)	100

The objectives of this new membership classification, to be designated as a Fellow of the American Society of Hospital Pharmacists, are to encourage hospital pharmacists (1) to prepare themselves by additional study and training to render better service to patients, (2) to raise the standards of practice of the profession, (3) to contribute to its literature, (4) to participate in the training of future practitioners, (5) to foster investigations and research, and (6) to become the type of professional individual who reflects credit upon his profession and stimulates others to emulate his good works.

4.7 Remuneration

Although data relative to the earnings of hospital pharmacists were collected, they are being omitted from this report. In general, the findings showed that salaries for hospital pharmacists in 1957 were low when compared with salaries in effect in other areas of pharmacy. Publication of these data in this report might be misinterpreted by the casual reader to imply that these are current salaries of hospital pharmacists, which they are not. These data are, however, available from the American Society of Hospital Pharmacists to anyone who requests them. They will also be used by the Society in connection with future studies of earnings of hospital pharmacists.

The findings of this study showed that in 1957, 50 percent of the chief pharmacists in the United States were earning less than the estimated usual rate paid in a community pharmacy. In addition, the median salary for chief pharmacists was less than $1000 more per year than that paid to a staff pharmacist. Assistant chief pharmacists and supervisors were paid only $100 to $200 above staff pharmacists. Such a situation tends to lead to frustration and lack of initiative. There is little incentive for a pharmacist to take on the additional responsibilities of a supervisor or assistant chief pharmacist. And there is not the comparative financial incentive in hospital pharmacy to attract and hold the better practitioners to fill positions ranging from staff pharmacists to chief pharmacists in face of competitive non-hospital positions. This undoubtedly contributes to the lower percentage of men in hospital pharmacy practice, as contrasted with community practice.

Median salaries are highest in the Pacific States and lowest in the New England States. The three areas which make up the southern states (namely South Atlantic, East South Central, and West South Central) have higher median salaries than the national average. When contrasted with pharmacists in other regions, a significantly larger percentage of chief pharmacists located in the East North Central States, the East South Central States, the West North Central States, the West South Central States, and the Pacific States receive higher salaries.

A significant number (17 percent) of chief pharmacists supplement their hospital salary by working on a part-time basis in community pharmacy (Q 63). One out of 5 chief pharmacists has sources of professional income other than his hospital salary. It is

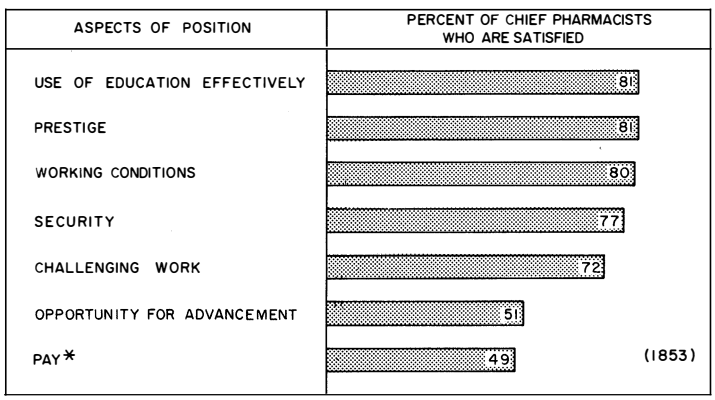


FIGURE 14. Satisfaction of Chief Pharmacists with Their Position in Hospital Pharmacy

interesting to note that 4 percent of chief pharmacists receive a bonus in addition to their hospital salary, while 2 percent receive consulting fees and 3 percent receive additional funds from teaching activities. Twelve percent of chief pharmacists, members of religious orders, receive no salary.

While less than half of the respondents were satisfied with their salary, a large percentage were satisfied with other aspects of their position such as the use of education effectively, prestige, and working conditions (Figure 14, Q 62).

These findings indicate that hospitals must establish more realistic salary ranges for pharmacists if hospital pharmacy is to be made a more attractive career. The vast majority of practitioners of pharmacy, unlike those of other members of the medical care team, do not work in hospitals. Since most pharmacists work in community pharmacies, it should be more generally recognized that salaries for hospital pharmacists must be at least competitive with those paid in community practice, including pharmacists in supervisory and managerial positions. Failure to recognize this salary factor tends to discourage the better skilled pharmacist from seeking a career in hospital pharmacy.

RECOMMENDATIONS

5.7 Full-Time Pharmacists for Hospitals with 100 or More Beds. It is recommended that all short-term hospitals with 100 or more beds be encouraged to provide the services of a pharmacist on a full-time basis, since the need in hospitals of this size is self-evident.

5.8 Study of Long-Term Hospitals and Hospitals Under 100 Beds. It is recommended that the American Society of Hospital Pharmacists conduct a study to determine the characteristics of those long-term hospitals and of those short-term hospitals under 50 and between 50–99 beds which make it possible for them to employ a pharmacist full-time, and to contrast these with the characteristics of a random sample of hospitals of the same size which are without the services of a pharmacist, with the objective of recommending ways and means by which the service of a pharmacist may be made available to the latter hospitals on either a full-time or part-time basis.

5.9 Utilization of Nonprofessional Employees in the Pharmacy. It is recommended that a study be made of the possibilities of greater utilization of the nonprofessional employee in the hospital pharmacy so as to free the pharmacist from nonprofessional tasks and to permit him to expend as much of his available time as possible in developing the professional functions of his department.

5.10 Realistic Salary Levels. It is recommended that hospitals be encouraged to establish realistic salary levels for staff pharmacists, which are at least equivalent to salaries paid by community pharmacies and that the salaries paid to chief pharmacists and assistant chief pharmacists be more commensurate with their responsibilities as professional department heads and with their management role in the hospital.

5.11 Survey of Earnings of Hospital Pharmacists. It is recommended that a survey of the earnings of hospital pharmacists be made at least every five years in order to provide information for encouraging pharmacists to seek a career in hospital pharmacy and for developing the profession.

5.12 Fellowship. It is recommended that there be established within the Society a type of membership to be known as a Fellow of the American Society of Hospital Pharmacists.

5.13 Membership Campaigns. It is recommended that the American Pharmaceutical Association and the American Society of Hospital Pharmacists carry out coordinated, sustained membership campaigns to enlist the support of all hospital pharmacists to help achieve the goals toward which they are striving.

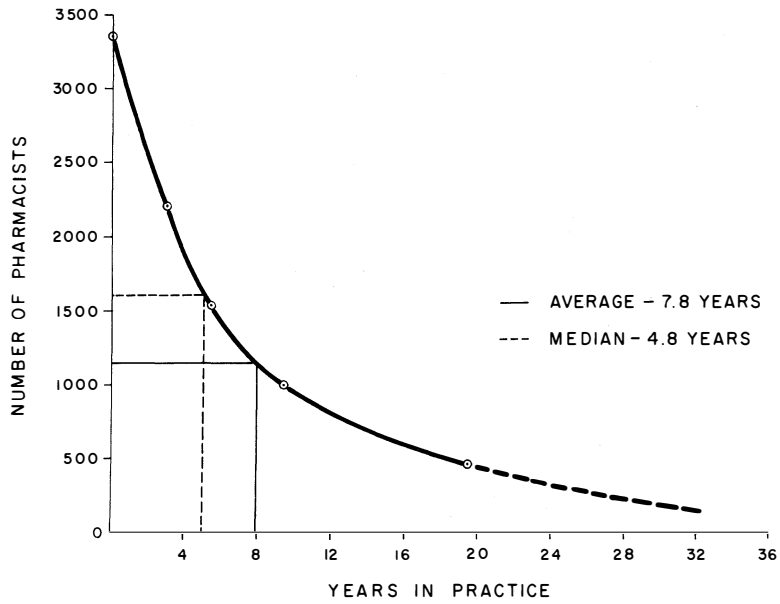


FIGURE 15. Attrition Rate Curve for All Hospital Pharmacists in Sample.

5

MANPOWER REQUIREMENTS

5.1 Annual Replacement Factor

We have approximated the future manpower needs and calculated a replacement factor for hospital pharmacists using the data contained in Figure 13: Length of Service of Pharmacists in All Sizes and Types of Hospitals. While this information is far from ideal from which to make these estimates, we believe the methods used are valid and the results are close approximations.

In 1957, the total number of pharmacists practicing full-time in hospitals was 4845 (Table 18). We have not calculated a separate replacement factor for the 988 pharmacists employed part-time in hospitals.

Our first approach was to find the national average for the number of years worked by hospital pharmacists as observed in this survey. This was calculated, using the information in Figure 13, as follows:

Average Years	*Percent*	*Pharmacists-Years*	
1.5	34	51	
4.0	20	80	
7.5	16	120	
14.5	16	232	
25.0 (approximate)	11	275	
	97	758	Total pharmacists-years

The average number of years worked by hospital pharmacists as observed in this survey is 758/97 = 7.8 + years. Using this data, the replacement factor for the number of pharmacists required annually to maintain the present force is 12.8 percent: 4845/7.8 (from Figure 13) = 621 pharmacists required annually to meet current manpower needs (621 × 100)/4845 = 12.8 percent.

Figure 15 illustrates the attrition for the length of time in practice by members of the sample. At the end of the first 3 years, there would be only 66 percent or 2212 out of 3351 remaining in practice. At the end of 5½ years there would be only 46 percent or 1541 remaining, etc., until our sample would be completely exhausted in approximately 35 years. Contributing factors such as retirement, death, transfer to a job outside of hospital pharmacy, etc., influence the attrition rate. This curve shows us the pattern of work experience of the hospital pharmacists in practice today.

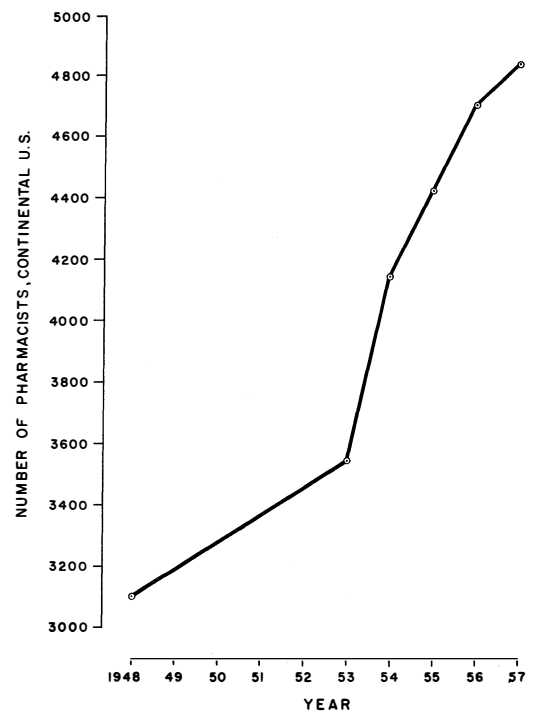
We are aware of two significant influences which produce this rather short length of service (7.8 years) as the average length of time in hospital pharmacy. Notice that the curve in Figure 15 falls off rapidly at the top. This reflects a high turnover rate among newcomers and to a lesser degree, some accelerated growth in total number of personnel during the 3 years preceding 1957. Such factors also tend to produce the wide separation of "median" length of service and "average" length of service observed.

The first 3 years of practice indicate a high turnover rate which may be explained by a high ratio of women to men of 1 to 2, whereas community pharmacy has a ratio of only 1 woman for every 9 men in practice. These are young pharmacists who, for the most part, have not yet decided on a career in hospital pharmacy. There are also internships and apprenticeships being completed by students in this category of under 3 years which add to the unstable conditions of this short-term group. This is an effect which cannot be accurately measured with the information we have, but we do recognize it and it is not likely to change appreciably in the years to come.

The second influence which is of major importance in explaining the limited work experience of the average hospital pharmacist is the accelerated growth in number of personnel since World War II. Figure 16 clearly shows this in the number of new members added each year since 1948. Under actual conditions of rather high turnover and accelerated growth during the 10 years preceding 1957, hospital pharmacists do show a variable career pattern with a high proportion of new members being added each year.

In our sample the new members who entered hospital pharmacy practice were, because of accelerated growth, intermixed with those pharmacists simply replacing others who had left the practice. But if no differentiation is made for the new members being added each year, we obtain what seems to be a very high turnover rate because of so many short-term

FIGURE 16. Growth Rate of Hospital Pharmacists 1948–1957.



individuals when actually many of these persons are additions to our growing total manpower requirements.

Thus, the object here is to determine the average observed career time of hospital pharmacists so that some estimate can be derived for our future manpower needs in hospital pharmacy. This involves only replacements for those leaving the practice and it is only on this basis that we can determine the expected length of service and, therefore, the number of pharmacists (replacements) needed each year to maintain our present requirements. The growth factor is not being ignored. The number of hospital pharmacists needed annually due to accelerated growth is accounted for separately.

Therefore, we modified our sample to include only those pharmacists who were replacing other hospital pharmacists leaving the practice. This amounts to a removal of those pharmacists from the sample who were added because of accelerated growth during the years 1947–1957. By referring to Figure 16, we can modify our survey findings as follows:

	0–3 years 1954–1957	*3–5 years 1952–1954*	*6–9 years 1948–1952*	*10–19 years 1939–1948*	*20+ years before 1938*
1. Total sample (based on 100%)	35%	20.6%	16.5%	16.5%	11.4%
2. **1957 Hospital** pharmacists total full-time (4845)	1696	998	799	799	552
3. Hospital pharmacists due to growth (see Figure 16)	688	707	350	Not reported	Not reported
4. Replacement hospital pharmacists (2–3)	1008	291	449	799	552

If we now plot the attrition rate curve for hospital pharmacists entering the practice as replacements for older members, we get a more accurate picture of their work experience under stable conditions. (See Figure 17.) We still have a sharp decline at the top of the curve due to a greater turnover among young, non-career persons (women and interns) as mentioned earlier. We cannot remove this influence and it must be accepted as part of the total career pattern and therefore, must be accounted for in determining our total future requirements. The straight-line effect through the middle of the curve is the most accurate pattern of *career* persons in hospital pharmacy. If we could concern ourselves exclusively with career persons (those having been in practice more than 3 years), we would find much more stability in the practice; an average length of service of 13.5 years, or a replacement of only 7.4 percent annually. We are, however, concerned with the total future need for hospital pharmacists, and therefore, the curve as a whole must be utilized here.

If on Figure 17, a line is drawn horizontally at the median level (individual), 1550 (our sample being evenly divided), until it meets the curve and then drops down to the scale in years, we observe that the "median" individual has been in practice for 7.8 years. It is interesting to note here that this is also the *average* length of service found for our entire sample (3351) so that the wide separation of "median" and "average" length of service as shown in Figure 16 must be due almost entirely to the accelerated growth factor.

If the period of 7.8 years were taken as the average career in hospital pharmacy, the annual replacement rate required would be 12.8 percent. Again, the "median" value is probably not the best because it is weighted too heavily with the effects of the many non-career hospital pharmacists at the top of the curve and has no bearing on the bottom of the curve where we get long-term stability.

Using 13.5 years as the *average* length of service is more accurate with our sample.

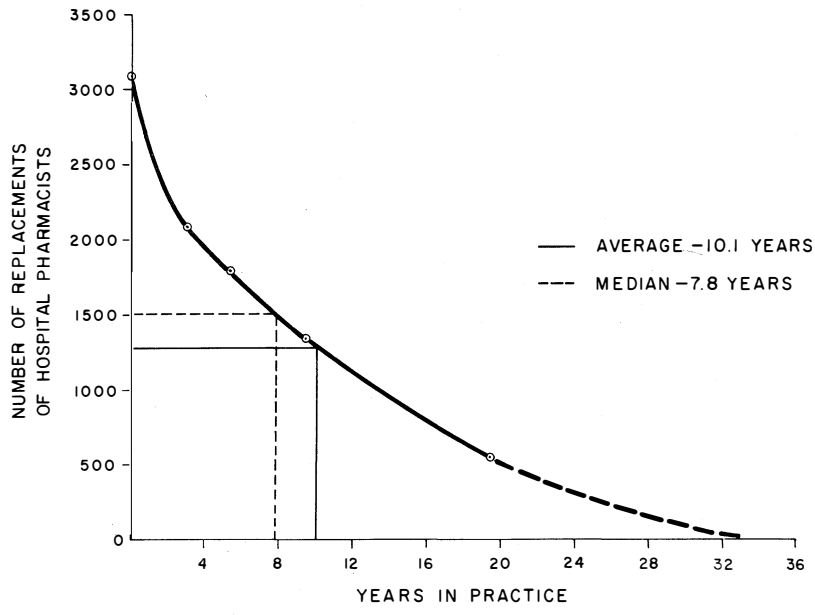


FIGURE 17. Attrition Rate Curve, Adjusted for Replacements of Hospital Pharmacists

Length of Service	*Number of Pharmacists*	*Pharmacist-Years*
1.5 years ×	1008 =	1,512.0
4.0 years ×	291 =	1,164.0
7.5 years ×	449 =	3,367.5
14.5 years ×	799 =	11,585.5
(approx.) 25.0 years ×	552 =	13,800.0
	3099	31,429.0 pharmacists-years total

$$\frac{31{,}429 \text{ pharmacist-years}}{3099 \text{ replacement pharmacists}} = 10.1 \text{ years, as the average length of service observed per hospital pharmacist}$$

$$\frac{4845}{10.1} = 479.7; \quad \frac{479.7}{4845} = 9.9\% \text{ replacement needed annually}$$

Using a second method, we obtain a very similar replacement factor. Let us arbitrarily say that a full career in hospital pharmacy is 35 years in practice. Then,

$$\frac{1}{35} \times \frac{4845}{1} \text{ (1957 total)} = 138 \text{ pharmacists needed annually for simple replacement}$$

But we know that the average observed length of service is only 10.1 years, therefore, it takes 35 years/10.1 years or 3.47 hospital pharmacists to fulfill a career of 35 years.

$$3.47 \times 138 \text{ pharmacists} = 479 \text{ pharmacists needed annually}$$

$$\frac{479 \times 100}{4845} = 9.8 + \% \text{ as the replacement factor}$$

A third method of calculation yields a slightly lower replacement factor. This involves the three major portions of the curve on Figure 17.

$$\frac{0\text{–}3 \text{ years}}{1008} \qquad \frac{3\text{–}19 \text{ years}}{1539} \qquad \frac{20 + \text{ years}}{552}$$

then,

$$\frac{1008}{3 \text{ yrs.}} + \frac{1539}{17 \text{ yrs.}} + \frac{552}{15 \text{ yrs.}} = 464 \text{ pharmacists needed annually—or, 9.6\%}$$

Thus, by three different methods, each of which seems valid, we arrive at annual replacement rates of 9.9, 9.8, and 9.6 percent. They are so nearly in agreement that it matters very little which rate is adopted. We suggest that a replacement factor of 9.8 would be a realistic factor to use to calculate manpower needs in hospital pharmacy.

Many of the ideas and methods presented in this paper were suggested by Donald C. Pelz, Ph.D., of the Survey Research Center; Ralph C. Fletcher, M.A., of the School of Social Work and the School of Public Health; Leslie Kish, Ph.D., of the Survey Research Center; and Bruce M. Hill, M.S., of the School of Public Health, all located at University of Michigan, Ann Arbor, Mich. However, the authors accept the responsibility for the use of the suggestions made and for replacement factors reported in this survey. These results are in general agreement with the first published study on manpower needs in hospital pharmacy done by Archambault, George F.: Needs for Hospital Pharmacists in the United States 1957–1970, *Am. J. Hosp. Pharm. 15*: 131 (Feb.) 1958.

TABLE 29. Estimated Annual Needs for Full-Time Pharmacists in Hospitals Reported with Pharmacists, Based on Annual National Growth 1957–1975

Year (1)	Number of Beds Projected from Base Year 1957 in Hospitals with Pharmacists to Include National Annual Growth of 10,000 Beds (2)	Number of Full-Time Pharmacists Needed to Provide Present Staffing Pattern and for National Annual Growth of 10,000 Beds (3)	New Full-Time Pharmacists Needed Annually, Staffing Rate of 7.2 per 1000 Beds		
			For National Annual Growth of 10,000 Beds (4)	For Replacement at 9.8 Percent Annually (5)	Total Full-Time Pharmacists Needed Annually (6)
1957	671,497	4845	—	—	—
1958	681,497	4917	72	475	547
1959	691,497	4989	72	482	554
1960	701,497	5061	72	489	561
1961	711,497	5133	72	496	568
1962	721,497	5205	72	503	575
1963	731,497	5277	72	510	582
1964	741,497	5349	72	517	589
1965	751,497	5421	72	524	596
1966	761,497	5493	72	531	603
1967	771,497	5565	72	538	610
1968	781,497	5637	72	545	617
1969	791,497	5709	72	552	624
1970	801,497	5781	72	559	631
1971	811,497	5853	72	566	638
1972	821,497	5925	72	573	645
1973	831,497	5997	72	580	652
1974	841,497	6069	72	587	659
1975	851,497	6141	72	594	666

5.2 Manpower Needs

Using 9.8 percent as a replacement factor, we are in a position to estimate the requirements for full-time pharmacists in the nation's hospitals. In approaching this problem we have prepared three tables: Table 29 shows the manpower needs in hospitals now employing pharmacists, based on an annual replacement factor of 9.8 percent and providing for an annual growth in these hospitals of 10,000 beds per year; Table 30 shows the annual needs in hospitals which do not now employ a pharmacist, but assuming that 3 percent of them will do so each year; and Table 31 which is a combination of the foregoing tables and shows total manpower requirements, considering all of the factors mentioned.

The number of new pharmacists needed annually to maintain the present staffing pattern in hospitals now employing pharmacists increases from 547 in 1958 to 666 by 1975 (Table 29). Basic assumptions are that the present staffing pattern of 7.2 pharmacists per 1000 beds remains constant and that all of the 10,000 beds added annually to this group of hospitals will be served by a pharmacist. Column 2 of the table records the number of beds in the 2339 hospitals employing pharmacists full-time in 1957 to which is added 10,000 beds annually, or one-third of the 30,000 beds estimated to be added annually to American hospitals. Thus, columns 2 and 3 show that in 1957 there were 671,497 beds in the hospitals employing pharmacists and that 4845 full-time pharmacists were employed. The figures in column 2 increase by 10,000 a year to provide for an annual growth of this number of beds. The figures in column 3 increase by 72 a year to provide for this additional number of pharmacists to staff the added 10,000 beds at the rate of 7.2 pharmacists per 1000 which is the present staffing pattern in hospitals with pharmacists. Column 5 shows the number of pharmacists needed annually for replacement, based on a replacement factor of 9.8 percent. Column 6 shows the total (column 4 plus column 5) number of pharmacists needed annually to provide replacements for those now in practice plus an additional 72 pharmacists annually for the 10,000 new beds added annually in hospitals now employing pharmacists. Basically, this table is a picture of the number of pharmacists needed annually to maintain the status quo in hospitals which now have pharmacists. It does, however, have one growth factor, the 72 pharmacists needed for the 10,000 beds added annually to this group.

The basic assumption in Table 30 is that, in hospitals which do not now employ a pharmacist, additional pharmacists will be added each year to cover 3 percent of the beds. This is admittedly an arbitrary and theoretical figure but one which we feel is conservative in the light of present trends. Column 2 shows the projected annual number of beds in hospitals re-

TABLE 30. Estimated Annual Needs for Full-Time Pharmacists in Hospitals Reported without Pharmacists and Annual National Growth at Growth Rate of 3 Percent 1957–1975

Year (1)	Number of Beds Projected from Hospitals Reported without Full-Time Pharmacists, 1957, to Include National Annual Growth of 20,000 Beds (2)	Number of Full-Time Pharmacists Needed to Provide for Annual Growth within Hospitals without Full-Time Pharmacists and Annual National Growth of 20,000 Additional Beds at 3 Percent (3)	New Full-Time Pharmacists Needed Annually, Staffing Rate of 7.2 per 1000 Beds		
			For Hospitals Reported without Full-Time Pharmacists 1957 and Annual National Growth of 20,000 Beds at Growth Rate of 3 Percent[1] (4)	For Replacement at 9.8 Percent Annually (5)	Total Full-Time Pharmacists Needed Annually (6)
1957	752,115	—	—	—	—
1958	772,115	166	166	—	166
1959	792,115	330	164	16	180
1960	812,115	491	161	32	193
1961	832,115	648	158	48	206
1962	852,115	803	155	64	219
1963	872,115	954	152	78	230
1964	892,115	1103	149	93	242
1965	912,115	1248	146	108	254
1966	932,115	1391	143	122	265
1967	952,115	1530	140	136	276
1968	972,115	1666	137	150	287
1969	992,115	1800	134	163	297
1970	1,012,115	1931	131	176	307
1971	1,032,115	2058	128	189	317
1972	1,052,115	2183	125	202	327
1973	1,072,115	2304	122	214	336
1974	1,092,115	2423	119	226	345
1975	1,112,115	2538	117	238	355

[1] Adjusted for total variations of decimal units in the calculations.

TABLE 31. Estimated Annual Needs for Full-Time Pharmacists in All Hospitals, Continental United States. Based on Annual National Growth and Growth within Hospitals without Pharmacists 1957–1975

Year (1)	Number of Beds in Total U. S. Hospitals, Based on National Annual Growth of 30,000 Beds (2)	Number of Full-Time Pharmacists Needed to Provide for National Annual Growth of 30,000 Beds for All Hospitals and for Growth within Hospitals without a Pharmacist (3)	New Full-Time Pharmacists Needed Annually, Staffing Rate at 7.2 per 1000 Beds			
			For National Annual Growth of 10,000 Beds to Hospitals with Pharmacists (4)	For Hospitals without Pharmacists and National Annual Growth of 20,000 Beds at Growth Rate of 3 Percent (5)	For Replacement at 9.8 Percent Annually (6)	Total Full-Time Pharmacists Needed Annually (7)
1957	1,423,612	4845	—	—	—	—
1958	1,453,612	5083	72	166	475	713
1959	1,483,612	5319	72	164	498	734
1960	1,513,612	5552	72	161	521	754
1961	1,543,612	5781	72	158	544	774
1962	1,573,612	6008	72	155	567	794
1963	1,603,612	6231	72	152	588	812
1964	1,633,612	6452	72	149	610	831
1965	1,663,612	6669	72	146	632	850
1966	1,693,612	6884	72	143	653	868
1967	1,723,612	7095	72	140	674	886
1968	1,753,612	7303	72	137	695	904
1969	1,783,612	7509	72	134	715	921
1970	1,813,612	7712	72	131	735	938
1971	1,843,612	7911	72	128	755	955
1972	1,873,612	8108	72	125	775	972
1973	1,903,612	8301	72	122	794	988
1974	1,933,612	8482	72	119	813	1004
1975	1,953,612	8679	72	117	832	1021

ported to be without a pharmacist, and provides for an annual growth rate of 20,000 new beds annually. Column 4 shows the number of new pharmacists needed to provide for annual growth of 3 percent within hospitals without full-time pharmacists and for the 20,000 new beds added annually, based on a staffing pattern of 7.2 pharmacists per 1000 beds. Column 5 shows the number of pharmacists needed annually as replacements for those leaving practice in these hospitals, based on a replacement factor of 9.8 percent. Column 6 shows the total number of pharmacists needed annually to account for growth and replacement (columns 4 and 5). Column 3 gives the totals of the number of pharmacists and represents a cumulative total of new manpower, according to the year indicated. Thus, by 1975, if the assumptions made here are correct, 355 pharmacists will be needed during the year to staff this group of hospitals at the 3 percent growth rate and at 9.8 percent replacement, and a total of 2538 new positions will exist in hospital pharmacy. Thus, Table 30 actually presents a growth picture for it depicts inroads of converting hospitals without a pharmacist to hospitals with a pharmacist. It also takes into account the national annual growth of 20,000 beds in hospitals without a pharmacist. The rate of change or growth is assumed to be 3 percent, which is applied annually on a progressive pattern of changes of the number of beds each year. The number of new pharmacists decreases each year because the number of beds in hospitals *without* pharmacists decreases annually despite the annual growth of 20,000 new beds in this group each year. Thus, if the basic assumptions describing the growth conditions of this situation be true, 86 years from 1958 or in the year 2044 all hospitals now without pharmacists will have a full-time pharmacist. Of course, this is purely theoretical and is vulnerable to many natural factors that can change this prediction. Furthermore, we recognize that there will always be hospitals without pharmacists, the majority of which will be in short-term hospitals under 50 beds and in long-term hospitals. Thus, in taking into consideration both our basic assumptions of growth patterns and the many hospitals yet *without* a pharmacist, there will be a point in time where this "growth" will stop and will assume a different sense of growth—growth in the sense that we are adding new pharmacists to maintain those beds added annually in the nation to hospitals already with pharmacists.

If Table 30 were presented graphically there would be a curve which would be negative and non-linear. (See lower graph in Figure 18.) However, in time, the curve would flatten out and would not end at the zero point. This would indicate the attainment of a status quo growth situation as would be obtained with

FIGURE 18. Estimated Annual Needs for Full-Time Pharmacists Based on National Growth in Hospitals, Continental United States 1957–1975

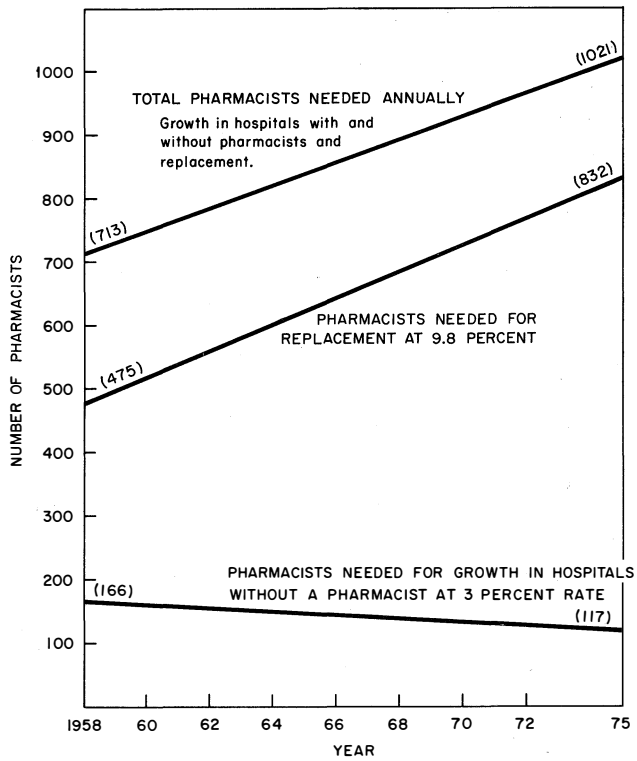


Table 29. The characteristics of this negative, nonlinear curve presents a true picture of what we may reasonably expect, that is, not all hospitals will have a pharmacist. This will be true especially in the short-term hospitals under 50 beds and in the smaller long-term hospitals. Furthermore, by the time the curve levels out an entire new set of conditions may exist to basically alter the pattern of growth.

By combining the information in Tables 29 and 30 we obtain an estimate of the annual manpower needs for pharmacists in American hospitals as shown in Table 31 and Figure 18. These figures predict that by 1975 there will be more than 8500 pharmacists practicing full-time in hospitals and that more than 1000 new pharmacists will be required to provide for replacement and growth. Column 2 shows the number of beds in all hospitals and provides for an annual growth of 30,000 additional beds. Column 4 shows that 72 pharmacists are needed annually to staff the 10,000 new beds added to hospitals which now have pharmacists, based on a staffing pattern of 7.2 per 1000 beds. Column 5 indicates the number of new pharmacists which will be required annually in hospitals not now employing a pharmacist and with the assumptions that 20,000 beds will be added annually to this group and that 3 percent of the total beds in this group are covered by new pharmacists each year at a rate of 7.2 pharmacists per 1000 beds. Column 6 shows the number of new pharmacists needed annually for replacement of those leaving hospital practice. Column 7 gives the total number of new pharmacists needed annually and represents the totals of columns 4, 5, and 6. Column 3 predicts the total number of pharmacists employed in hospitals in the years indicated.

These figures do not take into consideration the number of pharmacists employed part-time in hospitals. However, the ratio of full-time to part-time pharmacists in Table 18 is about 5 to 1. If this same proportion held true in the predictions for 1975, there would be about 1700 pharmacists employed part-time, making a total of more than 10,000 pharmacists employed either full-time or part-time in hospitals.

5.3 Manpower Needs in Small Hospitals

There are also additional manpower needs which have not been accounted for in the data thus far presented. These potential needs lie in general and special short-term hospitals with less than 100 beds. Additional study will be required to confirm the actual needs and the potentiality for employment of a large number of new pharmacists in these hospitals. New pharmacists employed in this group of hospitals would represent additions, rather than replacements to the manpower needs and, of course, a replacement factor would need to be applied to this group with a resulting increase in the total manpower requirements.

One of the basic questions is why about 1 out of 4 hospitals with 50–99 beds is able to employ pharmacists on a full-time or part-time basis and why 3 out of 4 hospitals in this group do not do so (Figure 7). While we are not able to answer this specific question, we have been able to obtain information which warrants further study.

When the group of hospitals with 50–99 beds are subdivided into those with 50–74 beds and those with 75–99 beds, we find some interesting data. For example, 1 out of 5 hospitals with 50–74 beds employs pharmacists on a full-time or part-time basis. It is noteworthy also that of those which do employ a pharmacist full-time, 1.25 pharmacists per hospital are employed and that in this group there is 1 full-time pharmacist per 50 beds. On the other hand, one out of 3 hospitals with from 75–99 beds employs pharmacists full-time or part-time. Here again there are 1.25 full-time pharmacists per hospital but in this case 1 full-time pharmacist per 70 beds.

Of course, we are not justified, without further study, in assuming that one or more pharmacists could be utilized in these two groups of hospitals. But it is reasonable to assume that some additional hospitals in these groups could justify services of a

pharmacist. At this point, we can only indicate that approximately 1200 additional pharmacists would be required if all hospitals in these two categories were to employ pharmacists in the same proportion that now serve in about 26 percent of these hospitals. However, this has not yet been proved and the actual manpower needs for this group of hospitals must be studied further. It is reasonable to assume, however, that some need does exist and when this specific need is determined it will undoubtedly show a need for more pharmacists than is indicated by the figures in Table 25.

We have for the present ignored the potential need for pharmacists in hospitals with less than 50 beds.

RECOMMENDATIONS

5.14 Census of Hospital Pharmacists. It is recommended that an authoritative census of the number of pharmacists employed full-time and part-time in hospitals be made at least every five years in order to provide a realistic basis for the need of continued recruitment programs and to supply manpower information.

5.15 Future Manpower Needs. It is recommended that the profession and especially the American Society of Hospital Phamacists take suitable steps to attract sufficient pharmacists to hospital pharmacy practice to meet its present manpower needs and to provide for an adequate expansion in the number of pharmacists employed in hospitals, in accordance with the findings of the census.

VI

Administrative services of the pharmacist

1

INTRODUCTION

1.1 Importance of the Pharmacy from an Administrative Viewpoint

The basic objectives of the pharmacy department are patient service, education and training, and research. To fulfill these objectives within the hospital complex, the chief pharmacist must rely on administrative processes. The administrative services of the hospital pharmacist are outlined briefly in the *Minimum Standard for Pharmacies in Hospitals*. In his administrative role, the pharmacist is responsible for developing, directing, and coordinating all the activities within the department and, further, integrating these activities with the needs of other hospital departments.

There are two main aspects to the administrative services which the chief pharmacist performs. First, it is essential that he utilize administrative skills in order to develop, improve, and expand the professional services of the department. Second, he must utilize administrative skills to fulfill the business and management functions of the department as they relate to the hospital's need for economic survival.

His need for administrative skills as a function of professional services is demonstrated in Chapter V (The setting within which the pharmacist functions) and Chapter VII (The professional services of the pharmacist).

His administrative role in fulfilling the business and management needs of the hospital has broadened during recent years. Many factors unite to make today's pharmacy department of far greater importance than ever before and, of course, it is the chief pharmacist upon whom the administrator depends for the proper management of this essential facility. Hospital pharmacies are now dispensing a high percentage of the prescription drugs produced in America. From 1929 to 1956 this percentage rose from less than 5 to more than 27 percent* or from less than 8 to more than $320 million worth. Predictions are that the volume of drugs dispensed through hospitals will continue to rise steadily with the increase in the nation's population, the increase in the number of citizens over 65 years of age, the greater utilization of hospitals for the treatment of both inpatients and outpatients, the introduction of more specific, more potent and more complex drugs, among other factors.

In 1956, about 10.5 percent of the hospital's nonpayroll expense was spent for pharmaceuticals. This fact alone, and its implications, places heavy responsibilities upon the pharmacist, responsibilities which have an important effect upon the efficient management of the total hospital. Since the pharmacy is one of the hospital's few self-supporting departments, one which often helps to overcome deficits in other service departments, its proper management is of great importance to the hospital's well-being.

Thus, in addition to his prime professional role, the chief pharmacist of each hospital has important managerial or administrative functions. His is the responsibility to spend wisely the significant percentage of the hospital's commodity budget going for medicinal agents. As a department head, the chief pharmacist must prepare the annual budget for drugs, initiate orders for them, watch price fluctuations, maintain a system of records, keep a careful eye on drug inventories, insure timely delivery and develop a system to distribute medications safely, regularly, and efficiently so that they may serve their ultimate purpose. Meanwhile, he must maintain relationships with those who prescribe and administer medications, the members of the medical and nursing staffs. He must advise the administrator who is depending upon him for the efficient management of the department, and he must see that patients are promptly and properly serviced. Finally, he must manage the personnel under his direction so that the work of his department may be accomplished. All of this requires careful planning. Good professional service is often

* 27 percent based on $1.2 billion ethical drug market in 1956 from Standard and Poor Industrial Survey, Section Drugs and Cosmetics 1956.

related to good management within the pharmacy, and to the existence of effective relationships with other hospital departments.

Thus, while the hospital pharmacist is first a pharmacist, he functions, in addition, as a combined business manager, accountant, procurement and pricing expert, production and distribution engineer, and liaison officer. These management functions are not only highly important; they are very time-consuming. As one looks at the staffing patterns of hospital pharmacies and relates them to functions, one can seriously question whether the administrative role of the hospital pharmacist has received its full recognition and whether adequate provision or planning has been made for it in relation to his professional functions. In the same vein one may question whether the dual role of the chief pharmacist is fully recognized or whether, on the one hand, there is emphasis of the managerial functions at the expense of professional functions or, on the other hand, there is emphasis of professional functions at the expense of managerial functions or, more seriously, whether both functions suffer because of failure to properly plan for their fulfillment.

The findings of this study indicate that greater recognition must be given to the role of the pharmacist as the head of an important department of the hospital, one in which well-balanced emphasis must be given to both the professional and managerial roles of the pharmacist. At the same time the pharmacist, himself, must lead the way by more fully recognizing his dual professional and managerial functions and in preparing himself to do the jobs which are his as a department head and as a professional man.

2

ADMINISTRATIVE RESPONSIBILITIES

2.1 Relationships with Administration

When the chief pharmacist reports directly to the head of the hospital or one of his immediate assistants we find that about 9 pharmacists out of 10 not only have considerable freedom in managing their department but also feel that their administrators are sympathetic toward their objectives. This was discussed in more detail in Chapter V. Within this framework, then, chief pharmacists appear to have excellent opportunities for the management of the pharmacy.

2.2 Formulation of Policies

Operation of the hospital pharmacy is guided by the establishment of administrative and professional policies. In general, administrative policies of the pharmacy may be thought of as those primarily related to the control of commodities, personnel, and relationships of the department to administration and to other departments. Professional policies relate to methods of procuring, preparing, dispensing, handling, and controlling drugs in the pharmacy and throughout the hospital when such methods are concerned directly or indirectly with the professional care of the patient. We may say also that administrative policies are developed primarily with the advice and consent of the administrative officers of the hospital, while professional policies are developed primarily with the cooperation of the medical staff through the pharmacy and therapeutics committee, though the latter are still subject to administrative approval.

Admittedly, there is often overlapping between the administrative and professional policies of the pharmacy. However, establishment of policies serves as a baseline from which all pharmaceutical activities, both administrative and professional, evolve. Such policies are essential for effective and consistent management of the pharmacy. They play a major role in affecting the various practices and services of the pharmacy which bear on the hospital's overall program for patient care.

2.3 Status of Written Policies

In this survey, chief pharmacists were asked to indicate whether they had established certain representative policies and procedures related to the operation of the pharmacy. The extent to which pharmacists have done this varies extensively, as shown in Figure 19 (Q 11). With the exception of a policy or procedure for the handling of narcotic drugs, far less than half of the pharmacists have developed written statements concerning the representative policies or procedures listed. Only about 1 pharmacy in 3 has written policies bearing on such administrative practices as pricing of drugs, purchasing, job specifications, development of a departmental organization chart, and orientation of new employees. On the professional side, less than 1 in 3 pharmacies has established written policies or procedures pertaining to the safe handling of medication on nursing units, the handling of flammable materials and investigational drugs, and practices to protect against errors in the dispensing of medication.

On the other hand, a significant majority of chief pharmacists have established unwritten policies and have developed unwritten procedures for carrying out professional and administrative functions. For example, while only 24 percent have a written policy or procedure for checking filled prescriptions to prevent dispensing errors, an additional 56 percent have a method of checking prescriptions but the method is not in writing. Thus, 8 chief pharmacists in 10 give attention to this matter. As shown in Figure 19, a similar pattern of practice applies to the other functions listed. The variation in the percentages of those

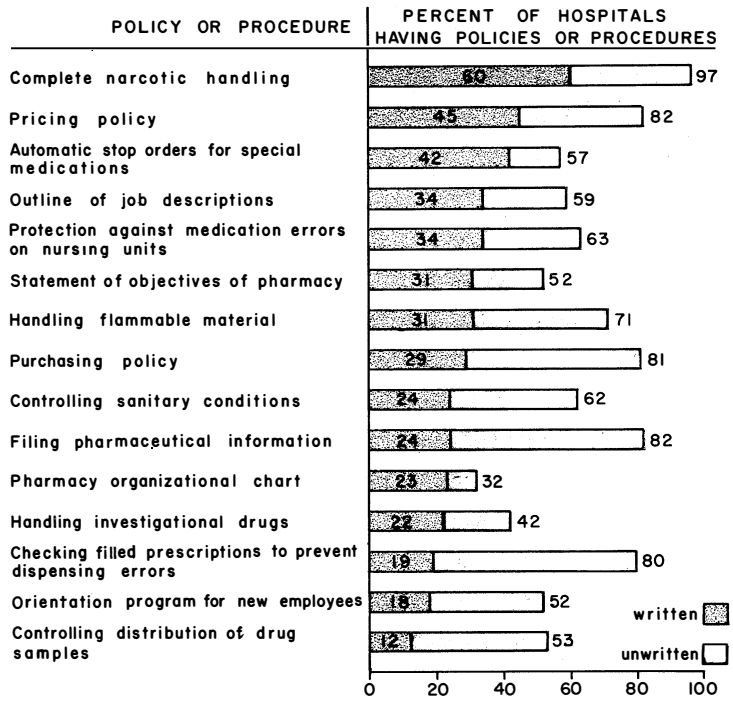


FIGURE 19. Status of Pharmacy Policies or Procedures in Hospitals with Pharmacists

having written or unwritten policies or procedures implies considerable variation in interpretation of the relative importance of different functions and the need for them to be covered by policies or procedures, written or unwritten.

TABLE 32. Status of Hospital Policies or Procedures Regarding Drugs on Nursing Units

Policy or Procedure	Percent			
	Yes	No	Don't Know	No Answer
Procedure for supplying information on a drug to the nurse before she can administer the drug	52	34	9	5
Policy preventing nurses from changing labels, refilling containers, etc., of medications on nursing units	79	15	4	2
Suggested rules or procedures for writing medication orders by physicians so that nurses may properly interpret them	48	30	16	6

1853 Hospitals reporting.

The administrative abilities of the pharmacist in developing written policies and procedures play a significant role in carrying out his professional responsibilities particularly as they affect the nursing and medical staffs. Two examples serve to illustrate this point. The first example is shown in Table 32 which summarizes the responses regarding the status of policies or procedures regarding the handling of medication on nursing units. The essentiality of having drug information available on nursing units so that nurses may more effectively carry out their professional function of administering drugs is well established. However, only about half of the pharmacists report having a definite procedure for supplying this information to the nursing units. In contrast, in 8 out of 10 hospitals a policy has been established to prevent nurses from changing labels and refilling containers of medications on nursing units in order to reduce the possibility of medication errors. Again, only approximately half of the hospitals have suggested rules or procedures for the writing of medication orders by physicians so that nurses may properly interpret them. The responsibility for policies and procedures for the handling of drugs on nursing units is shared by the medical, nursing, pharmacy, and administrative staffs. The pharmacist does, however, have an important role to play in advising and helping to develop these working tools to promote patient safety and to increase professional proficiency. When he fails in his responsibility, all concerned are affected.

A second example blending the relationship between written policies and procedures with professional service may be seen from an analysis of Figure 20 and Table 33. The authority granted pharmacists to dispense drugs under their nonproprietary names when they are prescribed under their proprietary names comes from the medical staff. Eighty percent

TABLE 33. Does the Pharmacy Routinely Stock Any Brand of Any Drug Called for

	Number	Percent
Yes	(573)	31
No	(1236)	67
No answer	(44)	2
	(1853)	100

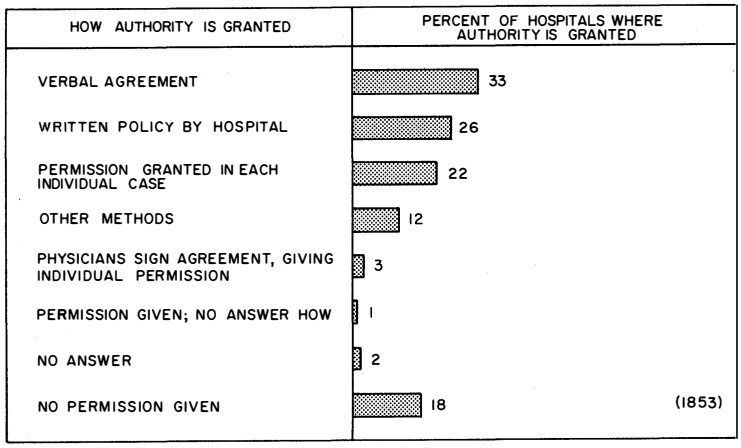


FIGURE 20. Authority of Pharmacists to Dispense Generic Drugs When Brand Names Are Requested

of the pharmacists state that such authority is given to them; yet only 26 percent report that this authority has been formalized into a written policy. Still, two-thirds of the pharmacists report that the pharmacy does not routinely stock any brand of drug prescribed (Table 33). This means that the pharmacist either must call members of the medical staff repeatedly to obtain their permission to dispense another brand of drug or must rely on prior verbal permission, a practice fraught with possibilities for misunderstanding. Failure to have written policies on this important matter has legal and ethical overtones and affects professional relationships among physicians, pharmacists, and nurses. In addition, increasing drug inventories affects the business management of the pharmacy department which, in turn, affects the hospital.

In comparing Table 32 and Figure 19, we note that a significantly greater number of hospitals have developed policies and procedures for the handling of drugs on nursing units than have been developed for the handling of drugs in the pharmacy department. This difference may be attributed to the fact that nursing, medicine, and administration are involved more directly in the former, while the major responsibility for the development of pharmacy policies lies with the chief pharmacist. This comparison does not speak too well for the initiative of pharmacists in accepting responsibility for the development of policies, especially when over 90 percent of chief pharmacists have considerable freedom in managing their departments (Chapter V).

While pharmacists perform poorly in preparing written policies and procedures within their own hospital, they do recognize quite well the usefulness of these management tools. Nine out of 10 chief pharmacists state they would find a representative list of suggested policies and procedures quite useful if such were prepared and made available to them by their national professional organization (Table 34, Q 11a).

These findings indicate a certain laxness and lack of motivation on the part of chief pharmacists to provide policies for drug control within and outside the walls of the pharmacy. Sufficient emphasis has not been placed upon the development of this essential area of hospital pharmacy management. Several factors may contribute to the failure to have these administrative tools reduced to writing. For example, especially in some of the smaller hospitals, the chief pharmacist's long established close contact with the medical, nursing, and administrative staffs, the achievement over long periods of time of general understandings and agreements between individuals and departments, encourage an attitude of laissez faire and discourage motivation for preparing written policies and procedures. Again, hospital administrators may not have been insistent enough in encouraging the pharmacist to develop written policies and procedures. We believe, however, all would agree that the principal motivation should come from the pharmacist himself. In some cases the deficiency may be accounted for by lack of staff sufficient for the workload of the pharmacy department. While undoubtedly true in some cases, we are inclined to believe there is a tendency to place undue emphasis on this factor. One is inclined to conclude that a significant number of pharmacists are not fully cognizant of how to approach the problem of preparing written policies and procedures and lack practice in developing these skills. Regardless of the reasons for not preparing written policies and procedures, their lack emphasizes the need to encourage pharmacists to develop and use these important management tools in order to run their departments more astutely and to improve communications within their department and with other departments and professional staffs of the hospital.

These findings indicate that action should be taken to make hospital pharmacists more aware of the importance of written policies and procedures for the

TABLE 34. Usefulness of an Available List of Suggested Policies or Procedures to Chief Pharmacists

	Number	Percent
Extremely useful to useful	(1660)	90
Not very useful to not useful at all	(160)	9
No answer	(33)	1
	(1853)	100

effective professional and managerial functions which lie within their responsibility. Motivation and performance must also be engendered. Training in these skills should be emphasized during formal lecture courses in hospital pharmacy given in schools of pharmacy and during pharmacy residency programs. To assist pharmacists now in practice, discussions and workshops devoted to the development of policies and procedures should be conducted at various national and local seminars and meetings. The preparation of a series of suggested policies or procedures covering various areas of function and responsibility would also be valuable, but this would not eliminate the need for indoctrination of hospital pharmacists in the need, value, and use of these management tools nor the need to emphasize that any broad, general policies almost always must be modified to suit the situation existing in the individual hospital.

2.4 Administrative Decisions Regarding Scope of Service

There is considerable variation in the scope of pharmaceutical services provided by hospital pharmacists. This subject is discussed in Chapter VII and here we want only to point out that we believe there is a relationship between the extent of pharmacy service provided and the existence or lack of written policies and procedures in the pharmacy department. For example, a pharmacist who prepares a statement of objective for his department (Figure 19) is, we believe, more likely to go through the thinking process which will commit him to provide a broad range of professional service, to participate in the teaching program of the hospital, to train pharmacy residents, to conduct research, etc. Such thinking and planning of departmental functions lead to broader, more well-defined philosophies of responsibility which tend to place pharmaceutical service in a proper perspective within the framework of other professional services offered in the hospital. Such a process tends also to establish goals toward which the pharmacist can constantly strive as he seeks to improve and expand his service. Without this process, there is a tendency for the pharmacist to carry out day-to-day functions in a more or less routine manner with no particular objective in mind.

It is true that pharmacists have stated that their scope of service is limited by lack of personnel, space, and equipment. This is discussed in Chapter VII. We are sure that this is true, but we believe also that development and use of such management tools as written policies, procedures, and records would, in a large number of cases, help the pharmacist to obtain what he needs to do the type of job he outlines to his administrator. Effective use of the tools of management will help bring about professional objectives.

2.5 Additional Administrative Duties

A number of chief pharmacists are responsible for other hospital functions in addition to pharmacy. Approximately 1 in 5 pharmacists serves also as the hospital purchasing agent while 1 in 20 is responsible for central sterile supply service and for central stores (Table 35, Q 4).

The extent of utilization of hospital pharmacists in additional administrative roles is more strikingly apparent when the data are arranged according to the bed size of the hospital (Table 36). Here we note the very extensive utilization of pharmacists for additional functions in hospitals with less than 100 beds. In hospitals with 100–199 beds, 4 out of 10 pharmacists have additional administrative duties. And even in the larger hospitals about 1 in 4 chief pharmacists carries additional responsibilities.

The high percentage of pharmacists performing dual functions in hospitals with less than 100 beds is undoubtedly a significant factor in the ability of these hospitals to provide the services of a pharmacist. It represents an important consideration in future plans to provide pharmacy service to these hospitals and, if this practice should be adopted generally, it would have far-reaching effects upon the manpower requirements for hospital pharmacists.

In hospitals with more than 99 beds, more than 1 chief pharmacist in 4 has additional administrative

TABLE 35. Chief Pharmacists' Additional Duties Besides Pharmacy

Position	Number of Pharmacists Holding This Position in Hospitals According to Bed Capacity								
	Short-Term							Long-Term, All Sizes	Total
	Under 50	50–99	100–199	200–299	300–399	400–499	500 and Over		
Hospital purchasing agent	21	36	123	65	35	11	17	45	353
Central sterile supply service	6	12	25	12	5	3	7	15	85
Business officer	3	3	8	4	4	1	0	6	29
Assistant administrator	0	6	13	10	2	3	6	0	40
Blood bank	3	0	9	1	0	0	1	0	14
Clinical laboratory	3	0	10	2	1	0	1	3	20
X-ray department	3	9	5	2	2	0	0	3	24
Central storekeeper	9	21	25	9	1	1	0	24	90
Hospitals reporting	(48)	(156)	(546)	(363)	(198)	(95)	(144)	(303)	(1853)

TABLE 36. Extent of Utilization of Chief Pharmacists in Additional Administrative Roles

Bed Capacity	Utilization of Pharmacist in Additional Administrative Roles (Percent)
Short-term	
Under 50	100
50–99	56
100–199	40
200–299	29
300–399	25
400–499	20
500 and over	22
Long-term	
All sizes	32

responsibilities. When one relates this finding to the staffing pattern in these hospitals (Chapter V, Figure 8) and to deficiencies in the scope of pharmaceutical service offered in many hospitals (Chapter VII, Table 53), it is apparent that the profession must give more thought and consideration to these interrelationships. Pharmacy as a professional service should not suffer because of the assignment of additional administrative duties to the chief pharmacist. Whether it does or not is an important question. There is no reason why it should if the staffing pattern is adjusted properly.

The most frequent secondary role of the hospital pharmacist is that of purchasing agent (Table 35). This is undoubtedly related to the fact that drug purchases make up a significant percentage of the hospital's commodity budget. Utilizing the knowledge of the pharmacist as a procurement agent for the entire hospital results in effective utilization of personnel, especially in hospitals with less than 200 beds.

There appears to be increased utilization of the pharmacist as the individual in charge of central sterile supply. This cannot be proved, however, since there are no prior findings to serve as a baseline for comparison. Nonetheless, the pharmacist's background in microbiology, sterilization technics and controls, and procurement and supply problems prepares him for activities of this type. One may safely predict an increased utilization of pharmacists as supervisors of central sterile supply. If this does become a more definite trend, training for such activities should be incorporated into residency programs for hospital pharmacists.

About as many pharmacists are in charge of central stores as there are in charge of central sterile supply. While the latter utilizes the special professional training of the pharmacist, the former makes its demands more in the area of administrative skills. While special circumstances may justify such an arrangement, assignment of a pharmacist as central storekeeper is not an activity the profession should encourage, except in those cases where the pharmacist has general supervision over the unit and is required to spend but little of his personal time in this activity. The hospital pharmacist's specialized education and training would be more fully utilized in areas of the hospital other than central stores.

A number of pharmacists, in addition to their specific responsibilities in the pharmacy, also serve as assistant administrators. Not shown by this study is the number of pharmacists who are assistant administrators or administrators but who have no day-to-day responsibility within the pharmacy and are thus not included in this survey. The total of these two categories of pharmacists as assistant administrators may be significant. It may be reasonably assumed that pharmacists strive toward administrative posts because of greater remuneration. Some element of prestige may also be a factor although it is difficult to understand why a pharmacist would feel that pharmaceutical practice *per se* would not offer equal prestige, though somewhat different in character, than that offered by an administrative position. Still, many pharmacists become interested in overall administrative aspects of hospital operation and welcome an opportunity to accept a full-time administrative post. When this happens, the administrator-pharmacist's background should make him more receptive and understanding of the overall pharmaceutical needs of the hospital. If this be true, hospital pharmacy should advance more rapidly as more and more administrative posts are held by pharmaceutically trained individuals who can more fully understand the needs and recommendations of the hospital's chief pharmacist. On the other hand, if a large number of the more capable chief pharmacists leave pharmacy and go into administration, this will tend to weaken hospital pharmacy as an area of professional practice unless equally capable individuals with a stronger motivation for the practice of hospital pharmacy are found to replace them. There is one other potential danger of pharmacists serving in full-time administrative posts. This is the possibility of their being overly resistant to desirable changes in patterns of pharmaceutical practices in hospitals, this attitude being fostered by their own early experiences in hospital pharmacy without consideration of more desirable patterns of practice toward which hospital pharmacy should strive.

Additional duties of pharmacists include a scattering of those who serve as business officer or are in charge of the x-ray department, clinical laboratories, or blood bank.

In considering the frequent secondary roles assumed by pharmacists in hospitals, one must recognize the danger that pharmacy service may itself be unconsciously neglected and thus become the secondary, rather than the primary function. This may occur especially if the occupant of the dual position sees greater opportunities for recognition in his non-pharmaceutical role. This can be avoided only if the pharmacist serving in a dual role is cognizant of the dangers and takes steps to avoid them—and if pharmacy provides equivalent opportunities.

RECOMMENDATIONS

6.1 Written Policies. It is recommended that action be taken to encourage hospital pharmacists to develop and utilize written professional and administrative policies as management guides to aid in planning, developing, improving, and extending pharmacy service in hospitals.

6.2 Additional Administrative Duties. It is recommended that the profession give particular encouragement to the assumption by hospital pharmacists of those additional administrative duties which bring into play their professional skills and knowledge of drugs and chemicals, and preparation and sterilization of related health supplies.

6.3 Additional Administrative Duties and Scope of Service. It is recommended that a study be made of the effect assignment of additional administrative duties to the chief pharmacist has on the scope and quality of pharmaceutical service.

3

ACCOUNTING RECORDS

3.1 Types of Records Maintained

Establishment and maintenance of proper accounting records are essential for the pharmacist and administrator to evaluate the performance of the pharmacy department. Records provide information essential to effective financial management, to justify personnel needs, to measure workloads, to analyze functions, to gauge professional performance, to develop long-range plans, and to reevaluate objectives. Records are also necessary to meet certain legal requirements of federal, state, and local laws and regulations relative to the handling of narcotics, spirituous liquors, barbiturates, and other drugs.

Results of this survey show that records on pharmacy activities are not comprehensive enough to provide good management tools for the operation of the department (Figure 21, Q 7). Purchasing and inventory records are maintained by 88 and 73 percent of pharmacists, respectively, and represent the strongest area of record-keeping. Thus, records are available for sources of supply, specifications, unit cost of drugs and frequency of ordering. Records relative to workload (number of prescriptions, requisitions filled, etc.) are surprisingly weak with only 64 percent reporting availability of these management tools. Only about half of the pharmacists have records available on departmental overhead, budgets, and stock turnover. A large number of pharmacists who lack certain records nevertheless appreciate their importance and believe they should be available. For example, while only 45 percent have a departmental budget, an additional 19 percent believe it should be available.

3.2 Attitude Toward Records

The attitude of chief pharmacists toward the adequacy of their departmental records is interesting (Table 37, Q 17a). Almost 8 out of 10 believe they have either sufficient records or too many records to enable them to run their department efficiently. Only about 2 out of 10 feel that their records are inadequate.

TABLE 37. Attitude of Chief Pharmacists Toward Adequacy of Accounting Records Available on Their Pharmacy Activities

	Number	Percent
More records than needed	(158)	9
Right number of records	(1296)	70
Inadequate number of records	(353)	19
No answer	(46)	2
	(1853)	100

Analysis of the findings reflected in Figure 21 and Table 37 indicates that chief pharmacists as a group do not believe that the records mentioned in Figure 21 are essential for proper management of the pharmacy. This is shown by the fact that a high proportion of pharmacists do not keep the records listed

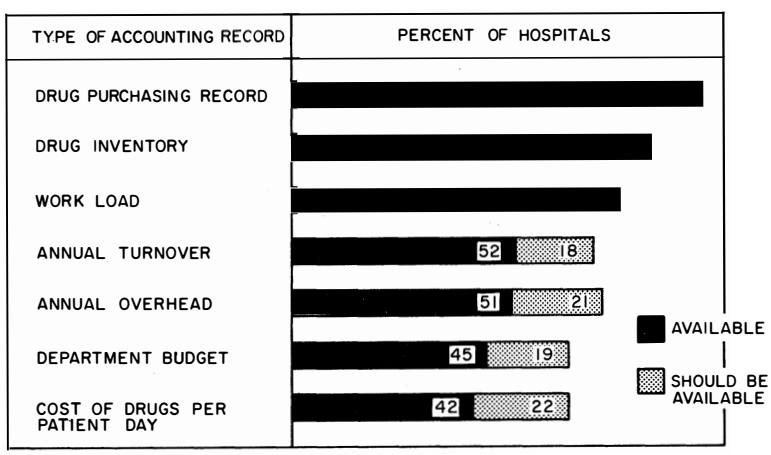


FIGURE 21. Availability of Accounting Records in Pharmacy Activities

while, at the same time, 8 out of 10 of them believe their records are adequate. Thus, interpretation of the meaning of and the value of essential records varies greatly among chief pharmacists.

One may conclude that chief pharmacists place too little value on records as management tools. This may stem from their lack of experience in accumulating and utilizing these management controls to gauge the performance of their department and to serve as a basis for the formulation of policy and to plan future objectives. Their lack of records must place chief pharmacists in a most difficult position when they discuss pharmacy problems and needs with their administrator. In fact, one is surprised that administrators do not require more comprehensive records to be maintained in the pharmacy, although, admittedly, the initiative for these should come from the pharmacist himself from whom the administrator has a right to expect the essentials of good planning.

RECOMMENDATIONS

6.4 Value of Records. It is recommended that hospital pharmacists be made more aware of the value and use of pharmacy records as management tools.

6.5 Devise System of Records. It is recommended that a study group review the matter of pharmacy records, suggest the type of records which should be maintained to effect good management of the department, and devise a system of pharmacy records readily adaptable to hospital pharmacies of various sizes and types, giving particular emphasis to devising a system which is simple and may be maintained with a minimum of time and effort.

4

PURCHASING

4.1 Authority for Specifications and Sources

At least 85 percent of chief pharmacists have authority to list acceptable sources of supply for drugs purchased for use in their hospital (Table 38, Q 18). However, pharmacists are also employed in central offices and agencies particularly governmental, and thus the responsibility for pharmacists in providing specifications and acceptable sources of supply is even greater than that implied in the 85 percent figure and is probably closer to 90 percent. Purchasing agents or others have this authority in only about 6 percent of the hospitals. Although it is only 6 percent, it does represent a significant number of hospitals. Only approximately 3 out of 10 hospitals have a written purchasing policy (Figure 19).

TABLE 38. Authority to List Acceptable Sources of Supply for Drugs

	Number	Percent
Chief pharmacist	(1583)	85
Central office or agency	(128)	7
Purchasing agent	(51)	3
Other	(56)	3
No answer	(35)	2
	(1853)	100

Responsibility for "specifications both as to quality and source for purchase of all drugs, chemicals, antibiotics, biologicals, and pharmaceutical preparations used in the treatment of patients" is assigned to the chief pharmacist in the *Minimum Standard for Pharmacies in Hospitals* approved by the American Hospital Association and the American Society of Hospital Pharmacists. It is almost universally agreed that the pharmacist should furnish the specifications even though a purchasing agent may do the actual procurement through a centralized department. This is based upon the legal and ethical responsibilities of the pharmacist for the quality of drugs he dispenses and his need to meet these responsibilities, and also to have the authority to provide specifications for the drugs he will use in compounding, manufacturing, and dispensing. The pharmacist must, of course, also have the authority to reject drugs which do not meet specifications.

4.2 Recourse from Questionable Sources of Supply

The recourse pharmacists have when drugs obtained from questionable sources of supply are delivered to the pharmacy under their professional supervision is shown in Table 39 (Q 18b). In viewing this table one must bear in mind that this occurrence would or should be no problem to about 9 out of 10 chief pharmacists since they already have the authority to supply specifications and sources of supply and implied in this is authority to refuse drugs which do not meet their specifications. In the group of chief pharmacists for which this problem does exist, however, most of them state that they will not dispense the questionable drugs and will refuse to accept them. Others would lodge complaints with the administrator or with the pharmacy and therapeutics committee.

TABLE 39. Pharmacists' Recourse to Problem of Drugs Obtained from Questionable Sources of Supply

	Number	Percent
Will not dispense, will refuse and return	(100)	5
Complain to administrator	(32)	2
Dispense them, nothing can be done	(28)	2
Run analysis	(12)	<1
Other (refer to P & T Committee, etc.)	(18)	1
No answer	(47)	3
	(237)	
Inappropriate, refuses the possibility or has authority to prevent such purchases	(1616)	87
	(1853)	100

Significantly, less than 1 percent of chief pharmacists would run an analysis of the drug in question, a reply which dramatically emphasizes the attitude toward and lack of experience of hospital pharmacists with this important professional tool. On the other hand, 2 percent of the chief pharmacists would dispense the questionable drugs in the belief that no other choice exists. To say that this situation should not exist is to belabor the obvious.

A high degree of correlation is shown by Tables 38 and 39. Those pharmacists (about 10 percent) for whom drugs may be obtained from questionable sources of supply undoubtedly have no authority over the specifications for these drugs. (About 10 percent do not have this authority.) Otherwise, they would simply return the drugs rather than lodging complaints to the administrator, etc. Thus, this represents an important area where the administrator must bear ultimate responsibility for the quality of drugs dispensed, a responsibility he is seldom qualified to assume and one which should be delegated to the pharmacist working cooperatively with the medical staff.

Several problems arise when the pharmacist does not have authority sufficient to procure quality drugs. As we have noted, sometimes drugs of questionable quality are dispensed, but more often this lack of authority results in delays necessitated by the time required to appeal to the administrator or the pharmacy and therapeutics committee with eventual reordering of a new supply of the drug in question. These delays deprive the patient of proper medication and almost always lead to frustration of the pharmacist. They lessen his initiative by creating too many obstacles for him to overcome and lessen his effectiveness as a professional man and as a department head.

4.3 Use of Bid Purchasing

Among all hospitals, about 40 percent of chief pharmacists employ bid purchasing in a frequency ranging from *all to most of the time;* 20 percent *sometimes* use it while 37 percent *almost never or never* use it (Table 40, Q 24). Of those who employ bid purchasing all to most of the time, about 36 percent obtain their bids through a central office or agency. In these cases the pharmacist is usually required to use bid purchasing by a regulation originating outside of the hospital. Thus, in those cases where he has an option, only about 1 chief pharmacist in 3 uses bid purchasing to a great extent.

TABLE 40. Frequency of Bid Purchasing in Hospitals According to Formulary Status

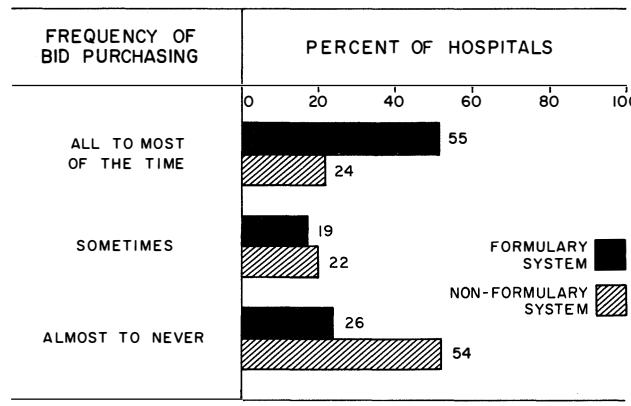
Formulary Status	Frequency of Bid Purchasing (Percent)			
	All to Most of the Time	Sometimes	Almost Never to Never	Total Percent
Yes	55	19	26	100
No	24	22	54	100
All Hospitals	43[1]	20	37	100
Ratio of Formulary to Non-Formulary Hospitals	3.2	1.2	0.7	2.2[2]

[1] About 36 percent of this group obtain their bids from a central agency.
[2] Adjusted to exclude hospitals reporting almost never to never.

4.4 Effect of Formulary System

Use of the formulary system in hospitals tends to increase the frequency of bid purchasing (Table 40). About 3 out of 4 hospitals with the formulary system use bid purchasing in a frequency ranging from *all of the time* to *sometimes;* over half of them use it as a general practice. In contrast, less than 1 out of 2 hospitals without a formulary system uses bid purchasing *all to most of the time* or *sometimes;* about 1 in 4 uses it as a general practice. Thus, more than three times as many hospitals with a formulary system employ bid purchasing *all of the time* or *most of the time.* This is understandable since the formulary system lends itself to practices underlying the bid concept. In view of this, it is surprising that 23 percent of hospitals with a formulary system never use bid purchasing or use it only sometimes. The influence of the formulary system on the frequency of use of bid purchasing is shown in Figure 22.

FIGURE 22. Comparison of Frequency of Bid Purchasing in Hospitals with and without Formulary System



Given rigid specifications and acceptable sources of supply, procurement of drugs through bid purchasing is a well-accepted practice. In a great majority of cases, a request sent to a half-dozen or more highly reputed pharmaceutical houses for a bid on a reasonable quantity of a competitive drug will result in a lower price than would be obtained if any one of them were sent an order for the same quantity of drug. It is known that many hospitals use bid purchasing effectively for trade-marked drugs because there are usually a number of wholesalers, in addition to the manufacturer, which are capable of

submitting bid quotations. Of course, the most commonly used method of bid purchasing is to obtain bids on the estimated semi-annual or annual needs for essentially all drugs. Under these conditions quality is not sacrificed for price. However, when the source of supply cannot be controlled and when assay and testing facilities are not available, competitive bidding can be a dangerous practice.

RECOMMENDATIONS

6.6 Quality of Drugs. It is recommended that hospital pharmacists insist on recognition of their moral, legal, and professional responsibilities to procure, store, and dispense quality drugs for the sick and that a statement embodying these principles and the exercise thereof be issued by the American Society of Hospital Pharmacists.

6.7 Specifications and Sources of Supply. It is recommended that a solution be sought to the problem which exists in some hospitals due to the lack of the pharmacist's authority to designate specifications and sources of supply for medications and that the legal and ethical principles of professional responsibility in this matter be brought forceably to the attention of those concerned.

6.8 Bid Purchasing. It is recommended that hospital pharmacists study the value of bid purchasing, giving great emphasis to acceptable sources of supply and to rigid quality specifications.

5

EXPENDITURE FOR DRUGS

5.1 Dollar Volume

American hospitals spent almost $322 million for pharmaceuticals in 1956 (Table 41, Q 28a). This represents about 27 percent of the estimated $1.2 billion spent nationally for ethical pharmaceuticals in this same period. Expenditure for drugs is becoming an increasingly significant factor in the overall hospital budget. Thus, the estimated non-payroll expense of American hospitals in 1956 was approximately $3 billion* and, of this, about 10.5 percent was spent for pharmaceuticals. This represents about 5.35 percent of hospitals' total $6 billion expense.

Some of the reasons for the large amount spent for drugs are the constant introduction of newer and more effective therapeutic agents which are costly to develop and distribute, the availability of an increasing number of diagnostic agents, introduction of new drugs for use in diseases which had previously been unresponsive to therapy, and greater utilization of the hospitals' inpatient and outpatient pharmacy service.

5.2 Median Annual Expenditure

The median annual expenditure for pharmaceuticals in hospitals grouped according to bed capacity and the effect of the formulary system on these annual expenditures is shown in Table 41. Median expenditures are seen to be lower in hospitals with a formulary system in all but those with a 300–399 bed capacity.

As noted in Figure 23, the line for median expenditure for drugs is essentially linear in the range from hospitals under 50 beds to those with 500 beds and over, although a slight dip occurs at the point of the 300–399 bed hospitals. As would be expected, long-term hospitals spend less for drugs than do short-term general hospitals.

As noted in Figure 23, hospitals with 300–399 beds, for example, have a median annual expenditure for drugs of approximately $95,000 as shown by the unbroken line and read on the right of the graph.

* *Hospitals 31*:(Part 2) 344 (Aug. 1) 1957.

TABLE 41. Annual Expenditure for Drugs in Hospitals with and without Formulary System and in All Hospitals 1956

Bed Capacity	Total Hospitals, Continental U. S.	Hospitals Reporting	Median Annual Expenditure in Hospitals with: No Formulary System	Formulary System	All Hospitals	Average Deviation for All Hospitals	Total Annual Expenditure for All Hospitals, Continental U. S.
Short-term							
Under 50	2409	48	$ 34,091	$ 19,231	$ 26,661	$15,173	$ 64,226,349
50–99	1296	156	37,500	27,778	32,639	20,678	42,300,144
100–199	973	546	48,969	43,015	45,992	24,561	44,750,216
200–299	461	363	70,000	65,566	67,783	35,060	31,247,963
300–399	229	198	94,736	95,833	95,285	44,218	21,820,265
400–499	113	95	123,077	111,111	117,094	45,949	13,231,622
500 and over	164	144	185,714	168,421	177,068	79,559	29,039,152
Long-term							
All sizes	1359	303	Not Reported	Not Reported	53,986	51,440	73,366,974
Total	7004	1853	—	—	—	—	$321,982,685

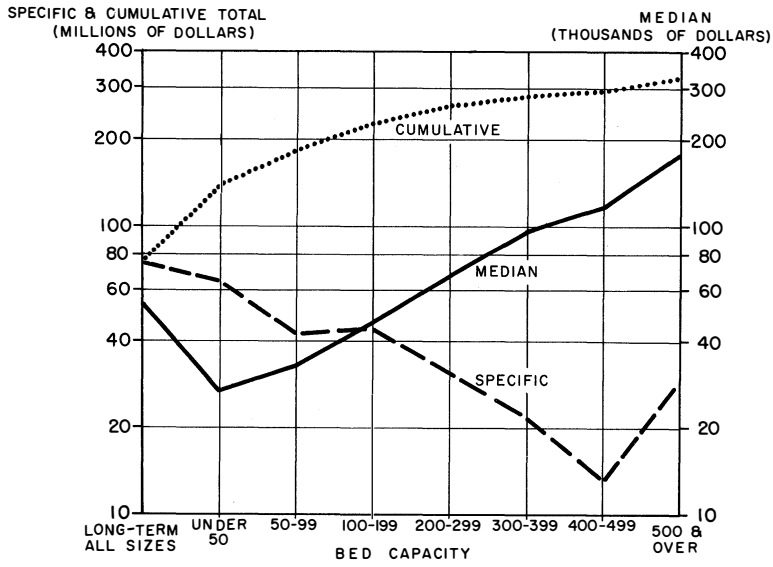


FIGURE 23. Annual Expenditure for Drugs in Hospitals According to Bed Capacity: Median, Specific and Cumulative Total, Continental United States 1956

The broken line labeled "specific" refers to total amount spent by all hospitals of a given size. All hospitals with 300–399 beds, for example, spent in 1956 about $22 million (read on the left of the graph).

The broken line labeled "cumulative" gives the total value in millions of dollars of drug expenditures of all hospitals of various sizes which fall to the left of any point taken. For example, the total cumulative expenditure for all hospitals from long-term to 400–499 beds is $300 million per year (as read on left of the graph).

5.3 Average Deviation

The average deviation of annual expenditure for drugs is noted in a separate column in Table 41. This column gives an idea of the average range, on both sides of the median, as reported in the survey. For example, the median annual expenditure for drugs reported by all hospitals with 100–199 beds is $45,992. However, the average deviation from this median is $24,561. Thus the range of drug expenditure for hospitals in this group, which may vary in size by almost 100 beds, may be from $32,431 to $70,553.

Perhaps the variation in annual expenditure for drugs is shown more clearly in Table 42 which shows that a 100–199 bed hospital may spend from less than $10,000 to more than $300,000 annually. We note, however, that the most predominate range is from about $25,000 to about $75,000. The wide deviation from the median annual expenditure for long-term hospitals and for hospitals with more than 500 beds is due to the fact that these groups include hospitals of widely varying bed capacities.

5.4 Effect of Formulary System

It has been taken for granted by hospital pharmacists and others that (1) hospitals with a formulary system spend less for drugs than hospitals without a formulary system, and (2) that expenditure for drugs increases as the size of the hospitals increases.

The mean annual expenditure for drugs in short-term hospitals with a formulary system is significantly different from the mean annual expenditure in hospitals without a formulary system as shown by analysis of variance, Tables 43 and 44. The methodology involves the use of the analysis of variance for two independent variables of classification (systems and

TABLE 42. Annual Expenditure for Drugs in Hospitals 1956

Bed Capacity	$1000–9999	10,000–24,999	25,000–49,999	50,000–74,999	75,000–99,999	100,000–149,999	150,000–199,999	200,000–299,999	300,000 or More	Total
	Number of Hospitals Reporting Annual Expenditure for Drugs									
Short-term										
Under 50	5	20	15	8	—	—	—	—	—	48
50–99	18	49	43	31	15	—	—	—	—	156
100–199	32	75	215	107	40	30	—	25	22	546
200–299	13	21	73	99	71	43	14	15	14	363
300–399	—	6	10	36	47	49	28	11	9	196
400–499	3	4	3	11	19	31	17	4	3	95
500 and over	—	—	3	4	17	37	26	27	30	144
Long-term										
All sizes	14	48	81	69	39	36	20	17	11	303

TABLE 43. Data for Analysis of Variance of Annual Expenditure for Drugs in Short-Term Hospitals with and without Formulary System and According to Bed Capacity

Bed Capacity	Annual Expenditure[1] in Hospitals with Formulary System	Annual Expenditure[1] in Hospitals with No Formulary System	Total	Mean
Under 50	$ 19,231	$ 34,091	$ 53,322	$ 26,661
50–99	27,778	37,500	65,278	32,639
100–199	43,015	48,969	91,984	45,992
200–299	65,566	70,000	135,566	67,783
300–399	95,833	94,736	190,569	95,284
400–499	111,111	123,077	234,188	117,094
500 and over	168,421	185,714	354,135	177,068
Total	$530,955	$594,087	$1,125,042	—
Mean	75,851	84,870	—	$ 80,360

[1]Data summarized from grouped data. See Table 41, 1550 short-term hospitals reporting from all bed sizes except long-term hospitals (all sizes).

bed capacity), single observation, 5 percent level of significance. The analysis of variances compares the estimates of the population variance from the mean for significant difference by using the F ratio to disprove the following two null hypotheses: (1) the mean annual expenditure for drugs in hospitals with a formulary system *equals* the mean annual expenditure for drugs without a formulary system, and (2) the mean annual expenditure for drugs in hospitals of under 50 beds *equals* the mean annual expenditure for drugs in hospitals with 50–99 beds, etc.

Arrangement of the data according to bed capacity, status of formulary system, and annual expenditure for drugs is shown in Table 43. As shown in this table, the annual expenditure for drugs in hospitals with a formulary system is about $76,000 while the average annual expenditure in hospitals without a formulary system is about $85,000—an average difference of approximately $9000. This difference, despite variations in business and management practices, is sufficiently great that we can say that hospitals with a formulary system differ in their annual expenditure for drugs from hospitals without a formulary system 95 out of 100 times and that those hospitals with a formulary system spend less in 95 out of 100 cases.

Shown in Table 44 is a summary of computations for the analysis of variance.

FIGURE 24. Analysis of Variance of Annual Expenditure for Drugs in Short-Term Hospitals, Effect of Formulary System at 5 Percent Level of Significance

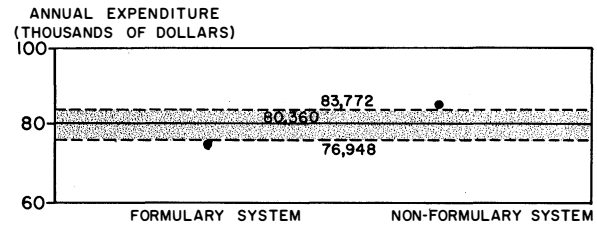


Figure 24 shows the analysis of variance of annual expenditure for drugs in short-term hospitals, the effect of the formulary system at 5 percent level of significance. The line through the middle portion of the graph shows the mean annual expenditure for drugs in all hospitals with and without a formulary system. The entire shaded portion shows the confidence limits, with 95 percent accuracy. For example, if both of the figures for the formulary system or non-formulary system fall within the central area, it indicates that they are the same as the parent population, or no different from each other, at a 5 percent level of significance. Since both fall outside of the shaded portion this proves that the differences between the formulary and non-formulary system are significant and not due to probability.

The analysis does not, however, necessarily imply that the annual expenditure for drugs of a specific hospital of a certain bed capacity with a formulary system is different from that of a hospital with the same bed capacity without a formulary system. This must be tested independently. Rather, this analysis informs us of the difference of annual expenditure in hospitals *as a whole*, with and without a formulary system and according to bed capacity, despite the variable business and management practices within and among hospitals, *e.g.*, use of bid purchasing, inventory control system, and so forth.

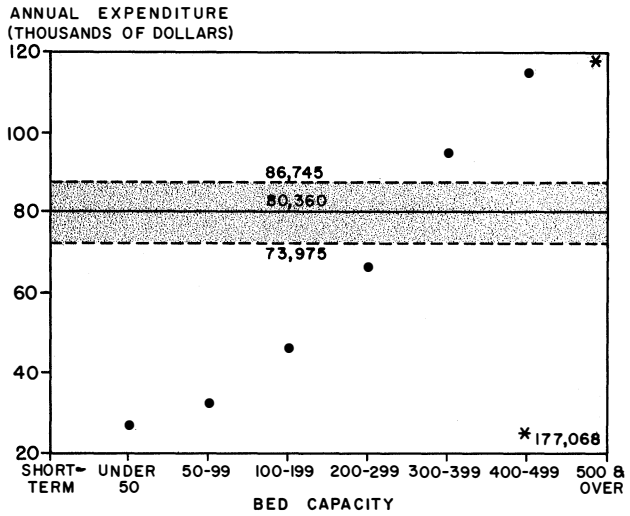
The following conclusions can be drawn from the analysis of variance. There is a significant difference in the mean annual expenditure for drugs in short-term hospitals with a formulary system when contrasted with expenditures in hospitals without a formulary system. The data observed shows that the mean annual expenditure is lower in hospitals using

TABLE 44. Analysis of Variance

Source of Variation	Sum of Squares[1]	d.f.[2]	Mean Square[3]	F ratio[4]	F (0.05)
Between column means	284,689,245	1	284,689,245	13.97	5.987
Between row means	34,849,369,516	6	5,808,228,253	285.06	4.284
Residual	122,252,749	6	20,375,458	—	—
Total	35,256,311,500	13	—	—	—

[1]Sum of squares is the amount of deviation about the mean of a standard population.
[2]d.f. is the degree of freedom.
[3]Mean square is the estimated variance about the mean of a standard population.
[4]F ratio is the ratio of two independent estimates of the variance from the standard population.

FIGURE 25. Analysis of Variance of Annual Expenditure for Drugs, Effect of Bed Capacity at 5 Percent Level of Significance



the formulary system. It will be noted that these conclusions are reached after an analysis of the two hypotheses, independent of each other, and that the two independent estimates of variance (bed capacity and formulary system) are not homogeneous estimates of the variance of the common parent population.

In addition, as would be expected, the mean annual expenditure for drugs is significantly different among hospitals categorized according to bed capacity (Figure 25).

5.5 Drug Expenditure per Patient Day

The annual drug expenditure per bed and per admission together with the expenditure per patient day are shown in Table 45. Of these figures the most meaningful relate to expenditure per patient day. However, the analysis of these findings is not easy because of several factors. First of all, it must be understood that the figures for the annual expenditure for drugs obtained in the survey include drugs dispensed to inpatients and to outpatients on prescription, drugs dispensed as floor stock, and related items such as stains, reagents, sterilizing alcohol, soap, etc. Therefore the annual expenditure for drugs is influenced by a large number of factors such as: number of patient days, number of admissions, length of stay per admission, number of outpatient visits and volume of drugs dispensed, type of hospital and range of service, formulary status of the hospital, business practices affecting turnover, inventory, purchasing, amount of manufacturing in the pharmacy, etc.

The most significant statistic that lends itself to analysis is the column in Table 45 on expenditure per patient day. This provides a common denominator

TABLE 45. Relationship of Drug Expenditure per Hospital Bed, Admission, and Patient Day

Bed Capacity	Annual Expenditure in Dollars per		Expenditure per Patient Day
	Bed	Admission[1]	
Short-term			
Under 50	$963.19	$27.74	$5.14
50–99	479.54	13.15	2.09
100–199	309.17	8.85	1.26
200–299	295.00	8.11	1.05
300–399	309.15	10.12	1.19[2]
400–499	290.69		
500 and over	247.48	13.19	1.06
All short-term hospitals	389.07	12.36	1.61
Long-term			
All sizes	93.51	37.01	—
Average	$226.17	$14.58	—

[1]Source of data: Hospitals, Guide Issue, Table 2, pg. 356 (Aug. 1) 1957.
[2]Combined average available for hospitals, 300–399 and 400–499 beds.

to compare the same types of hospitals of various bed capacities. Thus, for short-term general hospitals, the average drug expenditure per patient day is $1.61. However, we know that this figure is somewhat high because it also includes drugs dispensed to outpatients. In other words, the figures on expenditure for drugs collected in this survey did not differentiate between drugs for inpatients and drugs for outpatients.

While the figures for hospitals with 100 beds and over are fairly consistent in relation to each other, the figures for hospitals below 100 beds are high due to several possible reasons. For example, in hospitals with less than 50 beds the average drug inventory per bed is higher (Table 48), inpatient prescriptions per admission are lower but there is a higher ratio of drug orders to prescriptions (Chapter VII), the average length of patient stay is shorter, a proportionately higher ratio of outpatient prescriptions in hospitals of this size-range having pharmacists, and the fact that over 90 percent of these hospitals do not have pharmacists. Another factor which may have a bearing on this is that many smaller hospitals obtain their drugs from community pharmacists rather than directly from manufacturers or wholesalers.

For long-term hospitals the expenditure per patient day was not calculated because of the difficulty of obtaining figures on the average length of stay. However, the expenditure may be expected to be lower than for short-term hospitals because of the smaller range of drugs used.

Recommendations

6.9 Expenditure per Patient Day. It is recommended that hospital pharmacists calculate the expenditure for drugs for inpatients per patient day and for outpatients per clinic visit, these records to be established in such a manner as to clearly differentiate these two expenditures and to permit comparisons among hospitals. It is

further recommended that figures regarding expenditures for drugs from a representative sample of hospitals be collected and published annually.

6.10 Effect of Hospital Formulary System. It is recommended that chief pharmacists evaluate the formulary system for its effect on expenditure for drugs and inform their medical and administrative staffs of their findings.

6

INVENTORY

6.1 Median Inventory Values

The median annual inventory for drugs in hospitals with and without a formulary system is shown in Table 46. Here we see that hospitals operating under the formulary system have, in general, lower drug inventories than those using a non-formulary system. The exception to this is in the group of hospitals in the 300–399 bed category where both the drug inventory and expenditure are higher for hospitals operating under the formulary system. While we are unable to explain this variation, we do note that the differences are not as great here as are the reverse differences which exist between inventory and expenditure in other size hospitals with and without the formulary system. In the case of inventory values, however, we have not taken steps to statistically prove the difference, as was done with figures related to the annual expenditure of drugs in hospitals with and without the formulary system. But it is reasonable to assume that the median annual inventory in hospitals with the formulary system is less than in those without it, as was proved to be true statistically for drug expenditures.

The average deviation from the median inventory is also shown in Table 46. This depicts the variations about the central tendency for inventory values for hospitals within a certain range of bed sizes. Thus, about 60 percent of all hospitals with 100–199 beds have an inventory of $7191 to $19,087, of which the median value is $13,139.

The variation in the value of drug inventory which occurs in hospitals of the same relative size and type may be due to a number of factors among which are the following: (1) methods of inventory and stock control, (2) geographic location of the hospital in relation to sources of supply, (3) time required to obtain drugs under purchasing procedures of varied complexity, (4) amount of space available for proper storage of drugs, (5) the hospital's financial position and the need for an average or above average turnover rate, (6) whether the hospital provides pharmacy outpatient service, (7) the relative size and activity in the hospital of various medical specialties requiring substantial quantities of drugs, (8) the scope of clinical research, and so forth. Thus, drug inventories are bound to vary within certain limitations and all factors must be considered before an inventory figure is to be judged too high or too low. The importance of considering all factors cannot be overemphasized.

6.2 Range of Average Inventory Values

The range of average drug inventory, in dollar value, carried in hospitals of different sizes is shown in Table 47 (Q 28). Here we note the considerable variation in drug inventory carried by hospitals in the same range of bed capacities. However, within each size group it is possible to observe the clustering of higher numbers which signify the main tendency for the inventory values of a particular group. This tendency is, however, shown more clearly by the average devia-

TABLE 46. Annual Inventory for Drugs in Hospitals with and without Formulary System and in All Hospitals 1956

Bed Capacity	Median Annual Inventory in Dollars in Hospitals with			Average Deviation for All Hospitals	Total Annual Inventory for All Hospitals, Continental U. S. 1956
	No Formulary System	Formulary System	All Hospitals		
Short-term					
Under 50	Not reported	Not reported	$ 8,611	$ 514	$20,743,899
50–99	Not reported	Not reported	10,227	6,564	13,254,192
100–199	$14,054	$12,380	13,139	5,948	12,784,247
200–299	20,948	18,295	19,577	9,119	9,024,997
300–399	23,235	25,029	24,132	17,337	5,526,228
400–499	32,500	19,999	25,645	14,388	2,897,885
500 and over	38,333	35,564	37,833	21,398	6,204,612
Long-term					
All sizes	Not reported	Not reported	15,000	12,760	20,385,000
Total					$90,821,060

TABLE 47. Average Drug Inventory in Hospitals According to Bed Capacity 1956

Bed Capacity	Under $5000	$5000–9999	10,000–14,999	15,000–19,999	20,000–24,999	25,000–29,999	30,000–34,999	35,000–39,999	40,000–44,999	45,000–49,999	50,000–59,999	60,000–79,999	80,000–99,999	$100,000 or more	No Answer	Total
	Number of Hospitals Reporting Their Average Drug Inventory															
Short-term																
Under 50	9	18	12	6	0	0	3	0	0	0	0	0	0	0	0	48
50–99	12	60	33	24	6	0	6	0	0	0	3	3	0	0	9	156
100–199	21	130	168	110	47	13	11	4	3	3	2	3	1	1	29	546
200–299	4	30	72	77	54	40	32	15	5	3	5	5	1	2	18	363
300–399	3	12	26	23	39	26	22	7	10	9	11	2	1	2	5	198
400–499	1	8	14	13	9	8	12	4	8	3	6	3	2	1	3	95
500 and over	0	4	9	10	9	9	20	15	9	8	9	12	10	15	5	144
Long-term																
All sizes	18	81	45	42	27	18	15	6	0	12	9	3	9	3	15	303

1853 Hospitals reporting.

tion recorded in Table 46. One may also note, in Table 47, the number of hospitals reporting higher inventories moving gradually toward the right-hand columns as the bed capacity increases.

The average drug inventory per bed decreases as the size of the hospital increases. This is shown in Table 48 where the drug inventory per bed ranges from a low of $63.66 in hospitals with 400–499 beds to a high of $311.09 in hospitals with less than 50 beds.

6.3 Relationship of Inventory to Beds, Admissions, Patient Days

These relationships are shown in Table 48. We note that the inventory values per bed, per admission, and per patient day are relatively greater for hospitals under 100 beds. This is similar to the findings for the expenditure of drugs in these smaller hospitals and is probably caused by factors similar to those discussed under that heading. Short-term hospitals with more than 100 beds show inventory values per admission and per patient day which more closely approximate each other. As would be expected, inventory values per patient day are lowest in the larger hospitals. The higher inventory value per admission in hospitals with more than 500 beds is due partly to a greater length of stay, about 12 days in hospitals with more than 500 beds as contrasted to less than 9 days for smaller hospitals.

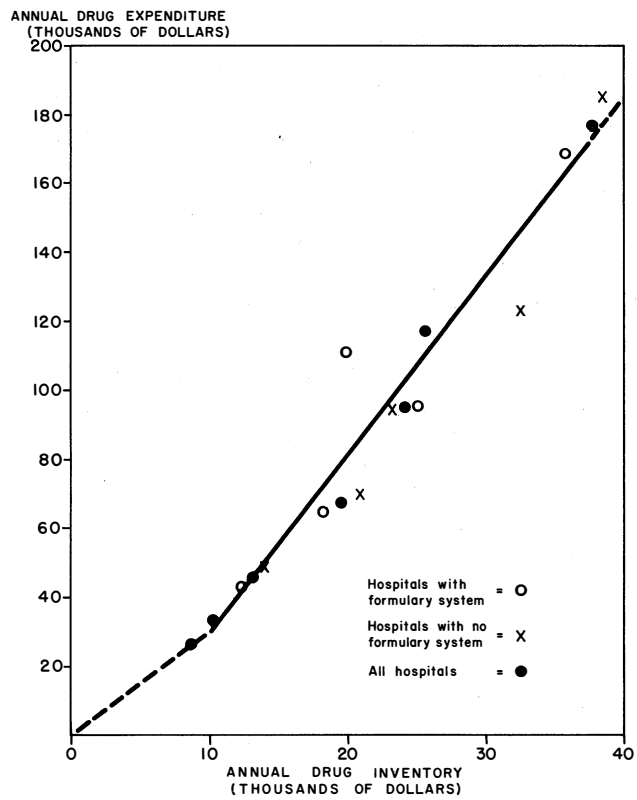
TABLE 48. Relationship of Inventory to Hospital Bed, Admission, and Patient Day

Bed Capacity	Annual Inventory in Dollars per		Inventory per Patient Day
	Bed	Admission	
Short-term			
Under 50	$311.09	$ 8.96	$1.66
50–99	150.26	4.12	0.65
100–199	88.32	2.53	0.36
200–299	85.20	2.34	0.30
300–399	78.30	2.43	0.29
400–499	63.66		
500 and over	52.88	2.82	0.23
All short-term	110.23	3.50	0.45
Long-term			
All sizes	25.98	10.28	—
Average	$ 63.80	$ 4.11	—

6.4 Relationship Between Drug Inventory and Expenditures

The relationship between drug inventory and drug expenditure is delineated in Figure 26. This rela-

FIGURE 26. Relationship of Annual Expenditure and Inventory for Drugs in Short-Term Hospitals 1956



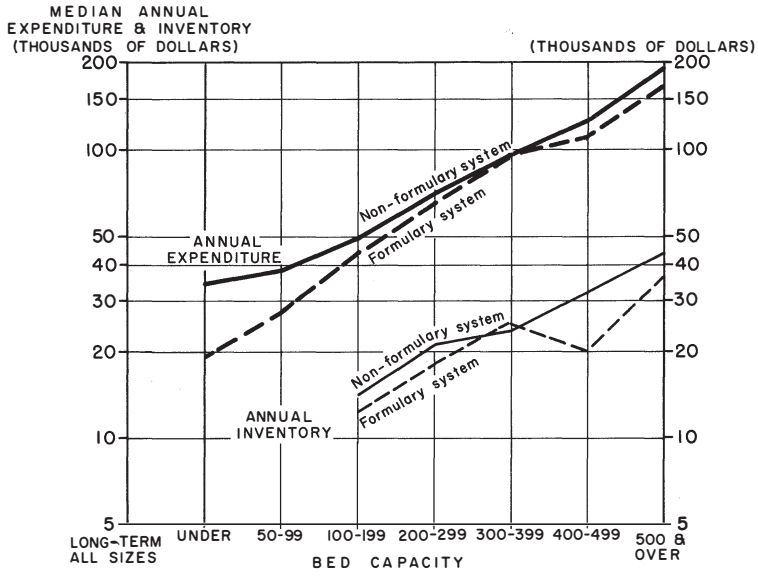


FIGURE 27. Median Annual Expenditure and Inventory for Drugs in Hospitals with and without Formulary System According to Size 1956

tionship was determined by correlation and regression analysis on the data found in Tables 41 and 46. The correlation coefficient at a 5 percent level of significance is 0.9918 and holds true when the expenditure is about $20,000 and the inventory is about $10,000.

Here we see that there is a definite relationship between annual drug expenditure to annual inventory and vice versa and that this relationship is linear. It must be stressed that Figure 26 depicts the relationship between drug inventory and expenditure in hospitals of all sizes and can be used only within limitations to predict one of the independent variables when the other is known. For example, in Table 46 we noted that the annual inventory for the average hospital with 200–299 beds is about $20,000. From Figure 26 we may infer that an *average* hospital with an inventory of $20,000 would have an annual expenditure of about $80,000, and vice versa. In general, this same relationship between inventory and annual expenditure would exist regardless of bed capacity. However, this relationship is disturbed by a significant deviation from the average turnover of drugs.

Figure 27 summarizes the information on annual expenditure and inventory for drugs and shows the influence of the formulary system. Note that the annual expenditure in hospitals with the non-formulary system is higher than in those with the formulary system. The expenditure under the two systems is about the same in hospitals with 300–399 beds—but the lines fan out in two directions from this point on the graph and the differences in expenditure under the two systems are greater in hospitals smaller than 300–399 beds, and also in the larger hospitals. A similar pattern is shown in the lower part of the graph where the influence of the formulary system on the annual inventory is shown.

6.5 Rate of Turnover

The rate of annual turnover of the drug inventory in hospitals ranges from 1 to more than 6 times a year (Table 49, Q 29). About 50 percent of hospitals have a drug inventory turnover rate of 3 or 4 times a year while 33 percent have a turnover rate of 5 or more times a year. Nineteen percent of hospitals have a turnover rate of only 1 or 2 times a year.

TABLE 49. Annual Rate of Turnover of Drugs

Rate of Turnover	Percent of Hospitals
1 time	5
2 times	14
3 times	24
4 times	24
5 times	13
6 or more times	20

1853 Hospitals reporting.

TABLE 50. Average Annual Turnover of Drug Inventory in Hospitals with and without Formulary System

Bed Capacity	Average Turnover		
	Hospitals without Formulary System	Hospitals with Formulary System	All Hospitals
Short-term			
Under 50	—	—	3.1
50–99	—	—	3.2
100–199	3.5	3.5	3.5
200–299	3.3	3.6	3.5
300–399	4.1	3.8	4.0
400–499	3.8	5.6	4.6
500 and over	4.8	4.7	4.7
Long-term			
All sizes	—	—	3.6

The average turnover of drug inventory in hospitals according to bed capacity is shown in Table 50. The rate of turnover in all short-term general hospitals tends to increase with the size of the hospital. Only in 2 of the 5 bed-size groups is the turnover greater in hospitals with the formulary system. In the 400–499 bed group the turnover is significantly greater.

In general, for most economical operation, the rate of drug inventory turnover should not be less than 3 or 4 times a year and we see that the large majority of hospitals satisfy this requirement. There is, however, a need for closer analysis of the relationship between the determination of a desired rate of turnover and the overall costs of the purchasing procedure including the rate of volume purchasing with resultant quantity discounts. The phenomenal rate of development and obsolescence of new drugs plays a considerable role in the rate of turnover of drug inventory. Also, the stocking of duplicate brands of the same basic drug tends to increase drug inventory and thus to reduce the turnover rate.

RECOMMENDATIONS

6.11 Effect of Product Duplication. It is recommended that chief pharmacists study the effect of product duplication on inventory and inform their medical and administrative staffs of their findings.

6.12 Inventory Records. It is recommended that chief pharmacists have an inventory taken annually and that information in this inventory be utilized to guide purchases, recommend policies, calculate inventory turnover, return obsolete drugs, and so forth.

7

PHARMACY WORKLOADS

7.1 Factors Involved in Workloads

An estimate of the partial workload of hospital pharmacies may be made by relating data in Table 73 (Chapter VII) to that in Table 21 (Chapter V). Results are shown in Table 51. These figures suggest information related to workloads in hospital pharmacies and also the volume of drugs dispensed in hospitals. They are not, however, an accurate measure of either for several reasons. First, numerous other elements, some measurable and others non-measurable, combine to make up the workload of a hospital pharmacy. Some of the measurable items are the number of items manufactured, the number of items prepackaged, the number of prescriptions extemporaneously compounded, and other operations which can be counted or measured. Other functions of the pharmacy cannot be so readily measured. These non-measurable items include such things as giving information by telephone or in person to members of medical, nursing, and other staffs; participating in meetings held in the hospital, such as those of the pharmacy staff, medical staff, nursing staff, administrative staff, pharmacy and therapeutics committee, and other committees on which the pharmacist may serve; teaching and training activities such as those involving medical or pharmacy interns and residents or student or graduate nurses; collecting data and preparing reports on stock control, drug costs, narcotic and hypnotic controls, workloads, purchasing, budgeting, etc. for departmental and hospital use; inspecting drug stocks on nursing units and within the department; preparing formulary supplements on investigational drugs; preparing procedural manuals; participating in local and national pharmaceutical meetings; interviewing detailmen; and numerous other duties relative to the operation of the pharmacy. The number of prescriptions dispensed and drug requisitions filled enter into the workload but are only a part of the total. Also the number of requisitions filled does not give a true picture of the actual workload in this category unless one knows the number, or average number, of items per requisition.

TABLE 51. Average Number of Inpatient Prescriptions and Other Orders Filled Daily in Hospitals, Based on a 6 Day Week by Each Full-Time Pharmacist

Bed Capacity	Daily Inpatient Workload per Pharmacist		
	Prescriptions	Other Orders	Combined Workload
Short-term			
Under 50	10	10	20
50–99	45	17	62
100–199	96	44	140
200–299	101	50	151
300–399	100	52	152
400–499	89	38	127
500 and over	61	35	96
Long-term			
All sizes	39	38	77

Table 51 indicates that, in hospitals with from 100 to 500 beds and over, about 100 to 150 prescriptions or orders are processed daily for each full-time pharmacist employed. While it is difficult to make a precise comparison of this workload with those reported by others, the number of prescriptions and requisitions filled falls within the range of those handled in pharmacies of the Public Health Service. For example, a report by Archambault (Division of Hospitals Bulletin No. 60-86, 1960) states that the Pharmacy Branch considers a daily measurable workload of from 125 to 190 units plus a normal amount of non-measurable activities as reasonable for a pharmacist working with adequate nonprofessional assistance in hospitals utilizing 6 or less pharmacists. A daily range of 126 to 158 units per pharmacist is considered normal by Archambault for the one- or two-man pharmacies, while 168–181 units per man is considered normal in pharmacies employing three to five pharmacists. The work units employed by the Public Health Service, however, differ by including the number of bulk compounded and prepackaged items, as well as prescriptions and requisitions. If we deduct the number of bulk compounded and prepackaged items and divide the resulting number by 43 (number

of pharmacists) and this quotient by 312 we arrive at approximately 107 prescriptions and requisitions filled per pharmacist in Public Health Service hospitals, based on a 312 day year or 6 day week. This means little more than that the findings of this study relative to workload measured in terms of numbers of prescriptions and requisitions fall reasonably close to the workloads reported by a group of governmental hospitals where accurate records are maintained. As has been pointed out elsewhere, however, the availability of nonprofessional helpers has a significant effect on workload and we have not compared the number of nonprofessional helpers available in Public Health Service hospitals with those available in other hospitals. Nor have we compared other measurable and non-measurable workload units.

The information in Table 51 is of limited use only, however, since it omits consideration of numerous factors. For example, not considered is the presence or absence of part-time pharmacists, or of nonprofessional personnel. Nor has any of the large number of functions which make up non-measurable workloads or other units of measurable workload such as manufacturing or prepackaging been considered.

We can make a rough estimate of workload, however, limited to only the number of prescriptions filled, by using as a basis the figures arrived at by Jeffries and Greenberg in their study. They state that the average time required for the proper dispensing of a non-compounded prescription is 8 minutes and that 14 minutes is required for the average compounded prescription.* Because the dispensing operation is somewhat different in hospitals due to standardization through prepackaging, the use of preprinted labels, and other factors, we have also included an arbitrarily reduced dispensing time of 4 minutes in order to arrive at a conservative figure. The results of these calculations are shown in Table 52.

TABLE 52. Estimation of Workload in Inpatient Prescription Dispensing According to Man-Hours

Bed Capacity	Average Number of Inpatient Prescriptions	Man-Hours Required[1] Annually to Dispense Prescriptions	Man-Hours Available[2] per Year	Man-Hours Available for other Pharmacy Activities
Short-term				
Under 50	3,571	238	2,288	2050
50–99	17,000	1133	2,496	1363
100–199	42,036	2802	2,912	110
200–299	59,473	3952	3,952	0
300–399	81,029	5402	5,408	6
400–499	96,747	6450	7,280	830
500 and over	106,417	7094	11,648	4554
Long-term				
All sizes	24,545	1636	4,160	2524

[1]Based on estimated 4 minutes dispensing time per prescription.
[2]Based on average number of full-time pharmacists (Table 21) and 40 hours per week.

7.2 Estimate of Partial Workload

According to Table 52, a hospital with 100–199 beds, for example, filling an average number of 42,036 inpatient prescriptions would require 2802 man-hours for the actual dispensing of these prescriptions, based on a time of 4 minutes per prescription. This is equivalent to the services of more than a full-time pharmacist for the dispensing operation alone, based on a work-year of 2080 hours. And, of course, these figures do not take into consideration such things as interruptions, rest periods, vacations, sickness, etc.; rather, they assume a constant pace throughout the year. We note that the average number of full-time pharmacists employed in hospitals with 100–199 beds is 1.4 which is equivalent to about 2900 man-hours per year. Hence, only about 110 hours of pharmacist's time is available annually, about 2 hours a week, for all of the other activities of the department. In addition, we note from Table 22 (Chapter V) that 60 percent of hospitals with 100–199 beds do not have the services of a nonprofessional person to assist the pharmacist nor do 78 percent of these hospitals have the help of a pharmacist part-time.

In a similar manner we note that hospitals with between 300–399 beds fill an average number of 81,029 prescriptions annually. Based on 4 minutes each, this requires 5402 man-hours annually, or the full-time services of more than 2 pharmacists. The average number of pharmacists employed full-time in hospitals with 300–399 beds is only 2.6 which is equivalent to about 5400 man-hours. This means that no time is available for all other activities of the department. In this case, however, about 80 percent of hospitals in this size range do have the services of a nonprofessional assistant, but only about 30 percent of them have the services of an additional pharmacist part-time.

Only in hospitals with 500 or more beds does the average staffing pattern provide for 1 or more pharmacists full-time for other activities of the department, beyond dispensing.

These findings, despite their limitations and approximations, indicate a need for a study of the staffing pattern of hospital pharmacies including professional and nonprofessional personnel. It appears that so much of the pharmacist's time must be devoted to purely dispensing functions, and this analysis is limited to only the dispensing of inpatient prescriptions, that little or no time is available for other functions. When one considers other dispensing functions, such as outpatient prescriptions and ward stock items, and adds the time required for these functions to the time required for the dispensing of inpatient prescriptions, it is obvious that almost no time is left to devote to other functions. In addition,

* Jeffries, S. B. and Greenberg, I.: Prescription Pricing, *J. Am. Pharm. Assoc., Pract. Pharm. Ed.* 17:383 (June) 1956.

as has been pointed out in Chapter VI, many chief pharmacists have additional administrative duties other than those pertaining to pharmacy. These factors may account, to a great extent, for the limited scope of service performed in many hospital pharmacies. Based purely on the volume of inpatient prescriptions dispensed, and making allowances for differences in procedure, it is questionable that any community pharmacist could possibly operate a prescription pharmacy with a staffing pattern similar to that existing in most hospitals. Hospital pharmacists do it only at the neglect of other essential professional and administrative functions.

Additional data need to be accumulated in order to obtain a more meaningful projection of pharmacy workloads. A uniform method of recording measurable and non-measurable workload is essential. For example, processing narcotic prescriptions or requisitions reflects a different workload unit than does the processing of a prescription or requisition for an intravenous fluid. Floor stock requisitions differ in complexity from other interdepartmental requisitions which contain a various number of items, some of which may require compounding or other manipulative procedures. Likewise the filling of prescriptions for inpatients usually requires a shorter average time than does the dispensing of outpatient prescriptions. But there is an even greater need for workload data, both for measurable and non-measurable activities, beyond those associated with a purely dispensing function.

RECOMMENDATIONS

6.13 Pharmacy Workload Study. It is recommended that a study be made of hospital pharmacy workloads in relationship to scope of service and staffing patterns, including the number of professional and nonprofessional personnel. The objectives of such a study would be to suggest in broad terms the basic staffing pattern required for hospital pharmacies which provide certain services.

6.14 Review of Functions and Staffing Patterns. It is recommended that chief pharmacists review the qualitative and quantitative aspects of their departmental functions in relation to their staffing pattern for both professional and nonprofessional personnel, evaluate the extent to which the objectives of the pharmacy are being accomplished and recommend appropriate action based on an analysis of their findings.

VII

Professional services of the pharmacist

1

INTRODUCTION

The professional services of the hospital pharmacist, as distinct from his administrative or management functions, are delineated in the *Minimum Standard for Pharmacies in Hospitals.* In his professional role the pharmacist is responsible for (1) the preparation and sterilization of injectable medication when manufactured in the hospital, (2) the manufacture of pharmaceuticals, (3) the dispensing of drugs, chemicals, and pharmaceutical preparations, (4) the filling and labeling of all drug containers issued to services from which medication is to be administered, (5) necessary inspection of all pharmaceutical supplies on all services, (6) the maintenance of an approved stock of antidotes and other emergency drugs, (7) the dispensing of all narcotic drugs and alcohol and the maintenance of a perpetual inventory of them, (8) specifications both as to quality and source for purchase of all drugs, chemicals, antibiotics, biologicals, and pharmaceutical preparations used in the treatment of patients, (9) furnishing information concerning medications to physicians, interns, and nurses, (10) cooperation in teaching courses to students in the school of nursing and in the medical intern training program, and (11) implementing the decisions of the Pharmacy and Therapeutics Committee.

To these should be added the responsibility of the pharmacist for investigation or research into professional or scientific problems. Thus, essentially all the responsibilities related to drugs, except their prescribing and actual administration to patients, are centered in the pharmacy department. Here, drugs of proscribed quality are procured or compounded, manufactured, packaged, labeled, controlled, and stored. The finished products are dispensed on prescription to individual inpatients and outpatients, or as stock drugs to nursing units, clinics, and other hospital departments. The pharmacy department is also a center for information on drugs, available to the nursing, medical, and dental staffs. In essence, the pharmacy bears responsibility in all areas related in any manner to the handling of drugs in hospitals.

One of the objectives of this survey was to determine the scope of professional services of pharmacists in hospitals of various sizes and types. We sought to determine the pharmaceutical services being performed, the factors limiting the scope of services, the pharmacists' attitude toward providing various professional services, and to elicit other information relative to qualitative and quantitative aspects of such functions as dispensing, manufacturing, assay and control, providing information on drugs, teaching, conducting investigations, and communicating with the medical staff.

2

SCOPE OF PHARMACEUTICAL SERVICES

2.1 Variation in Scope

There is considerable variation in the scope of pharmaceutical services provided by hospital pharmacists. If one considers compounding and dispensing to inpatients, supplying nursing and other departmental units with medication and providing drug information as the scope of pharmacy services, one is impressed by the fact that about 95 percent of hospital pharmacists provide these basic requirements (Figure 28, Q 15). If, however, one takes a broader view of pharmacy service in the modern hospital, he is equally impressed with the high percentage of pharmacists who do not and, more significantly, *do not want to provide* the broad spectrum of pharmacy service indicated in today's hospitals. For example, nearly half of today's chief pharmacists do not want to teach, to operate a bulk compounding or manufacturing program, or to supply reagents and other chemicals to hospital laboratories. About 2 out of 3 pharmacists do not want to do product development and research, while 3 out of 4 do not want to prepare sterile products in their laboratories. About 1 pharmacist in 4

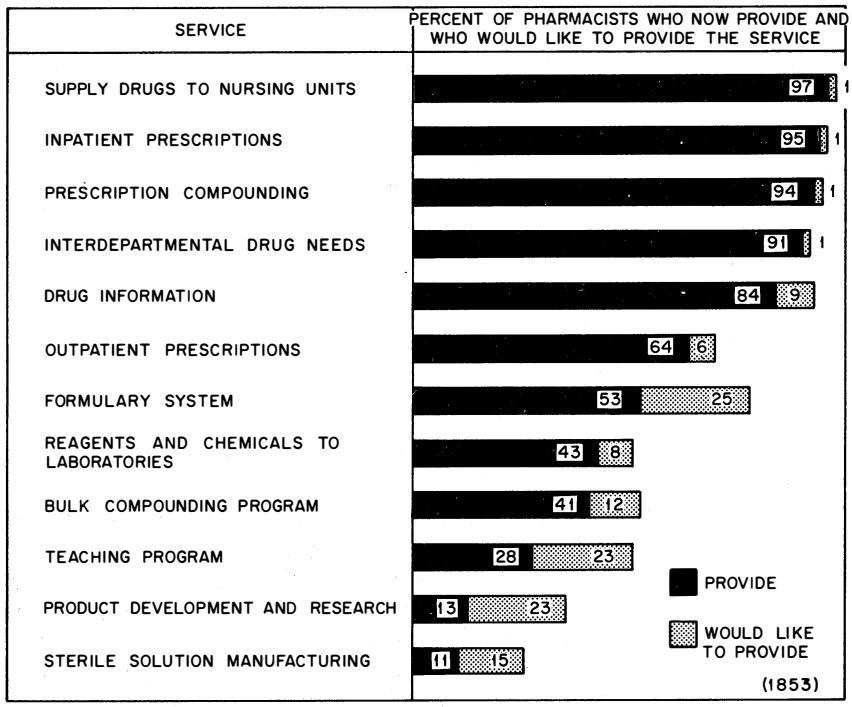


FIGURE 28. Scope of Pharmaceutical Service Provided by Hospital Pharmacists

does not want to operate under the formulary system, 3 out of 10 do not want to provide outpatient prescription service, while 1 out of 10 does not want to provide drug information service.

A comparison of the scope of pharmacy service in hospitals of various types and sizes is offered by Figures 29, 30, and 31. Figure 30 reflects the scope of service in short-term hospitals with 500 or more beds, a group that includes most of the country's teaching hospitals. A far larger percentage of these hospitals, in contrast to 100–199 bed hospitals (Figure 29), uses a formulary system, does manufacturing or bulk compounding, prepares sterile solutions and engages in teaching and research. This finding is consistent with expectations; one would expect greater opportunities in the larger hospitals, especially those with teaching functions. From this viewpoint, it is surprising that less than half of the pharmacists in these larger hospitals engage in teaching, research and product development, or the preparation of sterile medication.

In this study, the number of short-term hospitals with full-time pharmacists in the group having up to 199 beds (1018) is slightly more than the total num-

FIGURE 29. Scope of Pharmaceutical Service Provided in Hospitals of 100–199 Beds

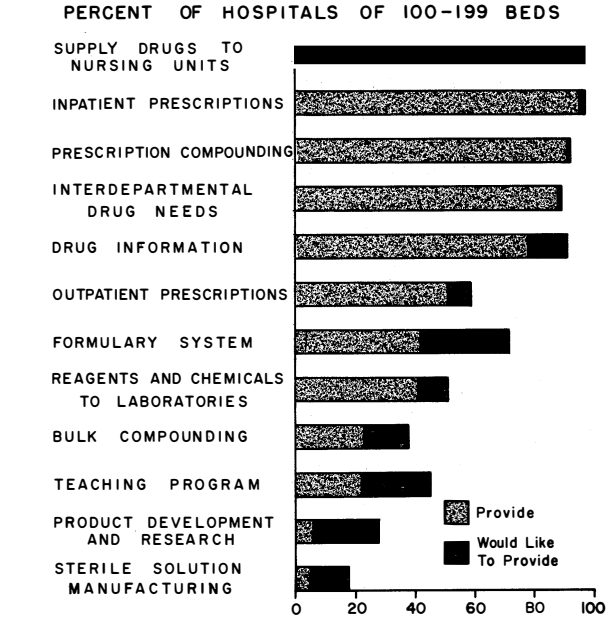
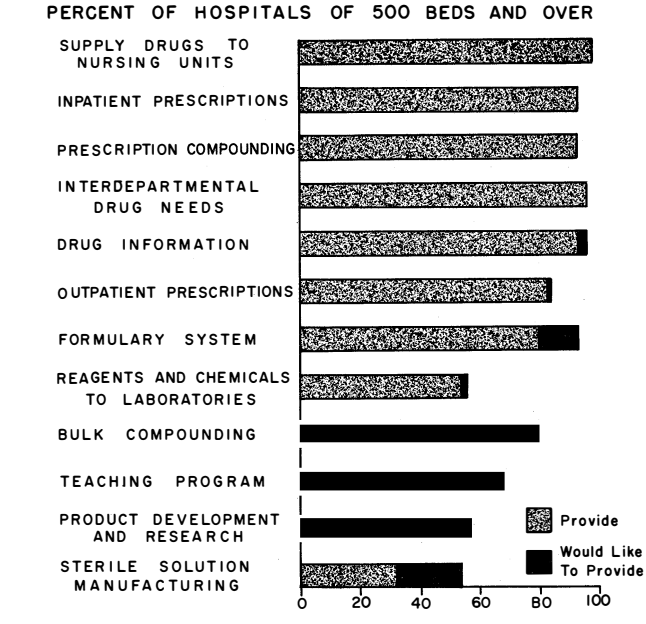


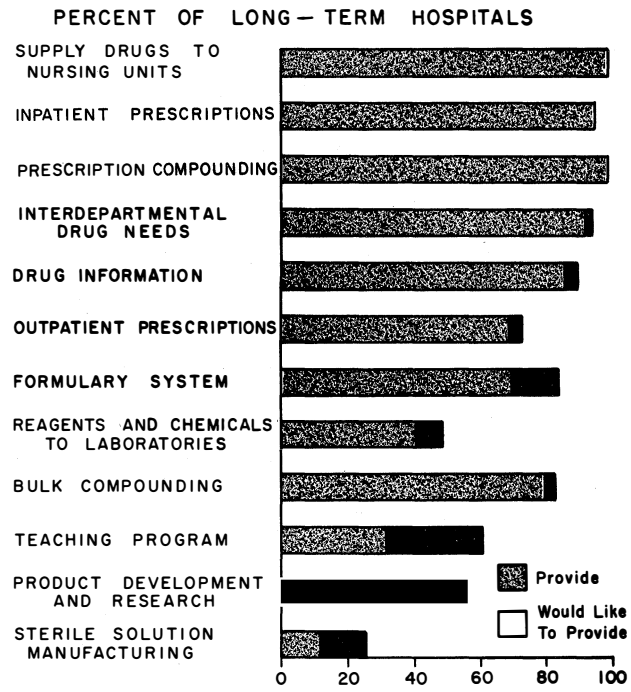
FIGURE 30. Scope of Pharmaceutical Service Provided in Hospitals of 500 Beds and Over



ber of short-term hospitals with more than 200 beds (949) (Table 16, Chapter V). Thus, more than half of the chief pharmacists responding to the questionnaire were in hospitals with less than 199 beds and about one-third of these were from hospitals with less than 100 beds. It is thus reasonable to believe that in a significant number of these smaller hospitals, opportunities for as complete a range of pharmacy service is not as great as exists in hospitals with more than 200 beds. On the other hand, it is interesting to note that the scope of pharmaceutical service provided by pharmacists in the smaller hospitals is very nearly as broad as that provided in hospitals with more than 200 beds (Table 53). This seems to indicate that hospital pharmacists, in general, tend to give the same type of service regardless of the size of the hospital. It also emphasizes that chief pharmacists in the larger hospitals do not take full advantage of the potentialities for increased service offered by the larger size hospital.

The scope of pharmacy service in long-term hospitals (Figure 31) exceeds that of hospitals with 100–199 beds and approaches closely to that offered in short-term hospitals with 500 or more beds. This may be related to the fact that many long-term hospitals are operated by the Public Health Service and Veterans Administration which have developed broad patterns of professional practice.

FIGURE 31. Scope of Pharmaceutical Service Provided in Long-Term Hospitals



2.2 Scope of Service in Small Hospitals

About 1 out of 4 short-term hospitals having between 50–99 beds employs a pharmacist either full-time or part-time. In hospitals with less than 50 beds, the ratio is 1:14. When pharmacists are employed in these small hospitals, the scope of pharmaceutical services provided rather closely approximates the services offered by pharmacists in larger hospitals. This is seen clearly when Figures 32 and 33 are compared with Figure 29 and Table 53.

The nearer the bed size of a general hospital approaches 100, the greater the probability the hospital can justify the employment of a full-time pharmacist.

TABLE 53. Scope of Pharmaceutical Service in Hospitals, in Percentage

Service	Bed Capacity														Long-Term, All Sizes	
	50		50–99		100–199		200–299		300–399		400–499		500+			
	Provide	Want to Provide	Provide	Want to Provide	Provide	Want to Provide	Provide	Want to Provide	Provide	Want to Provide	Provide	Want to Provide	Provide	Want to Provide	Provide	Want to Provide
Supply stock to nursing	94	—	98	—	96	1	95	1	96	1	97	—	98	—	99	—
Inpatient prescription service	100	—	92	4	95	2	95	1	98	0.5	96	—	93	—	95	—
Prescription compounding service	100	—	85	4	91	1	95	1	97	—	98	—	93	—	99	—
Interdepartmental drug needs	88	—	87	—	88	1	91	1	94	0.5	95	—	96	—	92	2
Drug information service	75	19	85	12	78	13	84	8	85	9	89	7	93	3	86	4
Outpatient prescription service	88	6	54	6	51	8	62	8	74	6	87	3	83	1	69	4
Formulary system	44	25	44	35	42	30	48	29	57	24	58	24	80	13	70	14
Supply reagents, chemicals, etc., to laboratories	69	6	44	4	41	10	43	8	40	8	42	9	52	4	41	8
Bulk compounding program	25	13	21	15	23	15	27	18	38	13	60	5	74	6	80	3
Teaching responsibility	13	13	10	17	22	23	30	27	33	22	34	23	47	21	32	29
Product development and research	—	19	4	10	6	22	9	23	11	31	16	24	31	26	27	29
Sterile solution manufacturing	13	25	8	8	5	13	8	18	13	16	18	16	32	22	12	14
Number of hospitals reporting	(48)		(156)		(546)		(363)		(198)		(95)		(144)		(303)	

FIGURE 32. Scope of Pharmaceutical Service Provided in Hospitals of 50 Beds or Less

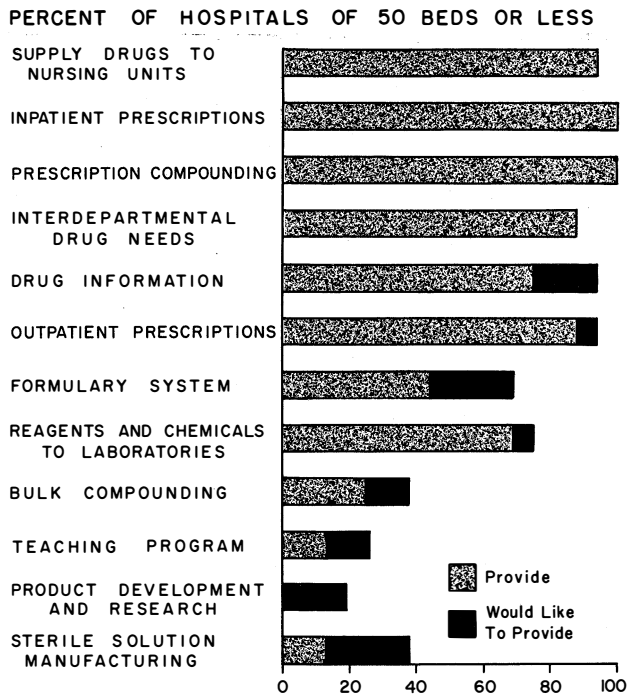
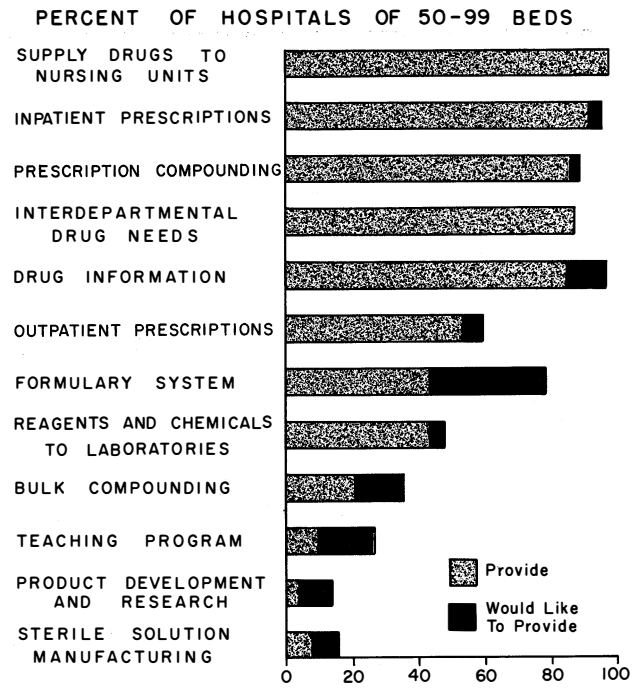


FIGURE 33. Scope of Pharmaceutical Service Provided in Hospitals of 50–99 Beds



With this in mind we examined the scope of service in hospitals with 50–74 beds and in those with 75–99 beds. Results are shown in Table 54. These findings compared with those of Figure 28, show that while the scope of service offered in the smaller hospitals varies in some details, it compares favorably with the services offered in the larger hospitals.

There are also some differences in the scope of services offered in hospitals with 50–74 beds as contrasted with those having 75–99 beds. For example, more of the latter provide prescription compounding service and drug information service. On the other hand, more of the 50–74 bed hospitals provide interdepartmental drug needs, outpatient prescription service, a formulary service, and a bulk manufacturing service. These findings indicate that a fairly wide scope of pharmacy service is and can be offered in hospitals with 50–99 beds. They also emphasize a need for further study to determine the possibilities of justifying the services of a pharmacist in the 3 out of 4 hospitals with 50–99 beds which do not now employ a pharmacist.

2.3 Factors Limiting Scope of Service

A significant percentage of hospital pharmacists want to provide additional services but, for one or more reasons believe they cannot do so under present circumstances. As shown in Figure 28, almost 25 per-

TABLE 54. Scope of Pharmaceutical Service in Short-Term Hospitals, 50–74 and 75–99 Bed Capacities 1957

	Bed Capacities			
	50–74		75–99	
Service	Percent Provide	Percent Would Like to Provide	Percent Provide	Percent Would Like to Provide
Supply stock to nursing units	96	0	100	0
Inpatient prescription service	96	0	96.4	3.6
Prescription compounding service	79	8	90	0
Interdepartmental drug needs	92	0	86	0
Drug information service	79	12.5	96.4	3.6
Outpatient prescription service	58	8	53.6	3.6
Formulary service	46	33	40	40
Supply reagents, chemicals, etc., to labs.	37.5	8	43	0
Bulk manufacturing program	25	17	21.4	11
Teaching responsibility	8	17	11	18
Product development and research	4	8	3.6	14
Sterile solution manufacturing	8	17	3.6	3.6
Hospitals reporting	(24)		(28)	

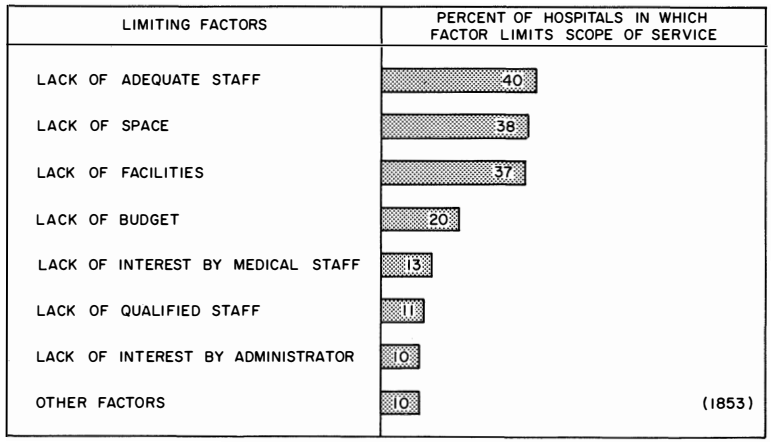


FIGURE 34. Factors Limiting the Scope of Pharmaceutical Service

cent of pharmacists, who do not now offer such services, want to operate under a formulary system, assume teaching responsibilities and undertake product development and research. Fifteen percent of chief pharmacists not now doing so would like to develop a parenteral or surgical solutions manufacturing program; 12 percent have a desire to undertake bulk compounding.

Lack of adequate staff, space, and facilities are the principal factors rated by about 4 out of 10 chief pharmacists as obstacles to providing a broader scope of service (Figure 34, Q 15a). As noted in Chapter V, there is definite lack of space and equipment in a large number of hospital pharmacies and these deficiencies understandably limit the scope of service in many hospitals. Other factors, such as lack of interest by the administrator and the medical staff, shortage of help, and insufficient budget are also contributing factors.

In some instances, failure to provide services can be accounted for on the basis of lack of facilities, space, and staff. These reasons may be accepted fully as valid. True, it may be extremely difficult for pharmacists with large workloads, inadequate space, staff and facilities to ever seriously consider expanding their services, especially if confronted with administrative apathy. In fairness to administrators and to medical staffs, however, only a little over 10 percent of chief pharmacists believe there is a lack of interest on the part of these two groups. In addition, there is a tendency on the part of some in any group to blame others for problems for which they should at least share responsibility. In fact, one cannot note the high percentage of pharmacists who do not want responsibility for teaching, or product development and research, for operating under the formulary system, for supplying reagents and chemicals to hospital laboratories or furnishing drug information, and fail to question the professional perspectives of these same pharmacists. Not being able to provide a full measure of service is one thing, but not wanting to provide it is entirely another matter and one which has far-reaching implications for the practice of hospital pharmacy and its future direction.

This apparent indifference on the part of some pharmacists may be due to an inadequate background of education and training, poor professional motivations, the failure of hospital pharmacy practitioners as a whole to establish deeply rooted patterns and standards of practice, emphasis by the colleges on preparation for community practice, and perhaps other reasons. Taken altogether, these instances of not wanting to provide additional services indicate a lack of professional vision on the part of many chief pharmacists.

In viewing the scope of pharmaceutical service offered in American hospitals, it is evident that numerous opportunities exist for hospital pharmacists to provide a greater range of service than is now being given. To bring this about, not only must pharmacists increase their own motivation to offer greater services, but hospitals must also provide more adequate facilities and encouragement, the need for which is discussed in Chapter V. As mentioned in Chapters I and VI, there is also probably a direct relationship between the administrative skills of the chief pharmacist and the scope of professional service offered by his department.

RECOMMENDATIONS

7.1 Scope of Service. It is recommended that an evaluation be made of the relationship between scope and quality of pharmacy service; the availability of measured amounts of space, equipment, and personnel; and the extent and skill with which the chief pharmacist utilizes management tools in operating his department.

7.2 Specialized Training. It is recommended that opportunities for additional on-the-job specialized training be made available to encourage hospital pharmacists to broaden the scope of their professional services.

3

DISPENSING TO INPATIENTS

3.1 Introduction

Dispensing of medication is one of the principal functions of the pharmacist. In hospitals, medication may be dispensed (1) upon individual prescription for a patient or (2) as stock to nursing or clinic units where it is administered to the patient by the nurse. Many hospitals employ a combination of these procedures and stock some medication on nursing units for inpatients, requiring all other medication to be ordered by individual prescription. Methods employed are often related to whether or not the patient is charged for the particular drug in question. No clear line can be drawn, however, and the matter is complex, with hospitals using all possible variations of the two methods.

In general, hospitals operated by the federal government dispense most of the commonly used medication in stock containers directly to nursing units whence it is administered to the patient. In addition, individual prescriptions may be required for certain categories of drugs or for drugs which are used so seldom that placing them as stock on all nursing units is not warranted. In the case of federal hospitals the method of dispensing is not related to drug charges since patients are not charged for medication.

Voluntary hospitals generally have certain drugs as floor stock for which no direct charge is made to the patient. In many instances an attempt is made to include as floor stock as many inexpensive drugs as possible so as to avoid the need for individual prescriptions and charges. All other drugs are dispensed on individual prescriptions and the patient is charged for them. In some cases, however, hospitals charge for all medication administered, including drugs which are stocked on the nursing units. Others charge for only selected items stocked on nursing units. With this great variation in methods of dispensing and charging it was difficult in this survey to obtain clear-cut information which lends itself to analysis.

3.2 Prescriptions and Drug Orders

The problem of obtaining information regarding the number of inpatient prescriptions and other orders for drugs dispensed annually was complicated because some hospitals do not use the term *prescription* exclusively, but refer to drug orders for individual patients by such terms as "drug slip," "drug order," "floor order," "nurse requisition." Other hospitals may use one of these terms for nursing unit medication dispensed in bulk for general use on the floors. In some instances injectable antibiotics, intravenous fluids and some other drugs may fall into different categories and are not included as prescriptions or floor stock orders. With these considerations in mind, the question was phrased as follows:

13. We would like to get information on the dispensing workload carried by hospital pharmacists. The term inpatient prescription, when dispensed for a specific patient only, may be known as drug slip, drug order, floor order, nurse requisition, depending upon the terminology used in various hospitals.

How many of these inpatient prescriptions are filled in your pharmacy per year? _____

13a. If the following items were not included in the total prescriptions, please indicate how many of these orders you fill annually.

Injectable antibiotics _____

Intravenous fluids _____

Drug orders _____

Others, please list _____

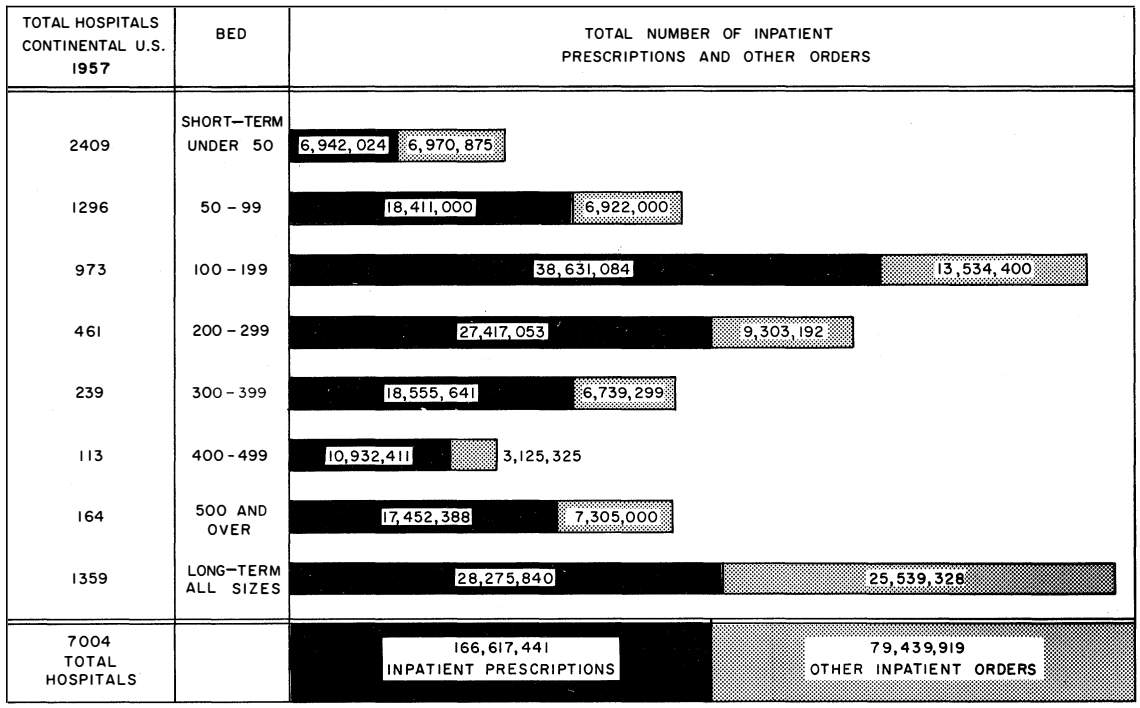
_____ _____

TABLE 55. Number of Inpatient Prescriptions and Other Drug Orders Filled in Hospitals 1956

Bed Capacity	Total Hospitals Continental U. S.	Inpatient Prescriptions		Other Inpatient Orders		Totals for Hospitals in Each Group[1]	
		Average Number	Average Deviation	Average Number	Average Deviation	Inpatient Prescriptions	Other Inpatient Orders
Short-term							
Under 50	2409	3,571	3,928	3,625	1,625	6,942,024	6,970,875
50–99	1296	17,000	15,059	6,500	4,071	18,411,000	6,922,000
100–199	973	42,036	28,399	19,225	12,731	38,631,084	13,534,400
200–299	461	59,473	35,286	29,628	21,938	27,417,053	9,303,192
300–399	229	81,029	46,103	41,859	29,319	18,555,641	6,739,299
400–499	113	96,747	60,526	41,671	30,039	10,932,411	3,125,325
500 and over	164	106,417	65,122	60,875	32,334	17,452,388	7,305,000
Long-term							
All sizes	1359	24,545	11,412	23,824	14,972	28,275,840	25,539,328
All hospitals	7004	—	—	—	—	166,617,441	79,439,919

[1]Adjusted for those hospitals that do not fill inpatient prescriptions or other orders. Based on 1853 hospitals with pharmacists reporting.

FIGURE 35. Number of Inpatient Prescriptions and Other Orders Filled in Hospitals 1956



3.3 Number of Inpatient Prescriptions and Drug Orders

More than 166 million prescriptions and about 80 million other drug orders were filled for inpatients in 1956. The number of inpatient prescriptions and other drug orders filled in hospitals according to bed capacity is shown in Table 55 and Figure 35. In Table 55 we note that the average number of prescriptions increases linearly with the increase in size of the hospital, from 3571 in hospitals with less than 50 beds to about 106,000 in hospitals with more than 500 beds. This seems to indicate that the amount of medication dispensed per prescription is about the same in all sizes of short-term hospitals. The average number of other inpatient orders rises in a more irregular pattern from 3625 to more than 60,000 in short-term hospitals. There is, for example, a higher ratio of prescriptions to drug orders filled in short-term hospitals with between 50–299 beds than in the larger size hospitals. This is undoubtedly related to the presence of a greater variety of stock drugs on the nursing units of larger hospitals, which, of course, tends to reduce the number of prescriptions. There may be some relationship here also to the scope of service offered by the pharmacy. For example, pharmacies which supply stains and reagents and other non-medication items tend to fill a greater proportion of requisitions.

The figure for the total number of prescriptions and requisitions filled are projections based on the average numbers found in the survey to have been filled in hospitals according to bed size. Here the assumption is made that all hospitals of a given bed size fill the same average number of prescriptions. Since these calculations are based on the average numbers of inpatient prescriptions and other inpatient orders, the resulting variations are due to the great differences in the total number of hospitals within each group according to bed capacity.

Long-term hospitals fill a much lower ratio of prescriptions to drug orders than do short-term hospitals. This is due probably to the specialized nature of long-term hospitals, the more restricted range of drugs needed, and, possibly, the support of many of these hospitals by a governmental agency. These considerations tend to favor placing the drugs used routinely on a ward stock basis.

The average deviation in the number of inpatient prescriptions and drug orders is also shown in Table 55. While the average is the best central estimate of the number of inpatient prescriptions and drug orders filled, the deviation from the average is indicative of the asymmetrical or skewed response curve obtained when all responses are plotted. The deviation also implies the great range in these values. For example, in the 300–399 bed category, the average number of prescriptions filled is 81,029, but the average deviation from this number is 46,103 which implies that 60 percent of the hospitals in this category fill from 34,926 to 127,132 prescriptions annually. We also note the

TABLE 56. Range of Inpatient Prescriptions Filled in Hospitals 1956

Number of Prescriptions	Hospitals Reporting	Percent
None	(29)	2
1–4,999	(201)	11
5,000–9,999	(118)	6
10,000–24,999	(280)	15
25,000–49,999	(301)	16
50,000–74,999	(212)	11
75,000–99,999	(102)	6
100,000–149,999	(117)	6
150,000–199,999	(42)	2
200,000–249,999	(34)	2
250,000 or more	(34)	2
No answer	(383)	21
	(1853)	100

TABLE 57. Range of Other Inpatient Drug Orders Filled in Hospitals 1956

Number of Inpatient Orders	Hospitals Reporting	Percent
None	(641)	35
1–2,999	(70)	4
3,000–4,999	(69)	4
5,000–7,999	(92)	5
8,000–9,999	(53)	3
10,000–24,999	(172)	9
25,000–49,999	(134)	7
50,000–99,999	(74)	4
100,000 or more	(60)	3
No answer	(488)	26
	(1853)	100

same type of variation with inpatient orders. This becomes more evident upon referring to Tables 56 and 57.

The extent of these deviations can be explained, in part, by the range of the bed capacity of the hospitals within each group which may differ by 50 beds or more, and by dispensing policies and practices which tend in some hospitals to favor prescriptions, and in others, drug orders. We note the greatest deviation in the short-term hospitals with 500 or more beds. In this case the deviation is greater because there are many hospitals with 1000 or more beds in this group. An even greater range is evident in long-term hospitals.

The range of the numbers of inpatient prescriptions filled by all hospitals is shown in Table 56. Thus we see that about 30 percent of hospitals fill between 10,000 and 50,000 prescriptions annually; about 11 percent fill between 50,000 and 75,000, while 12 percent fill between 75,000 and 150,000. Another 6 percent fill between 150,000 to 250,000 or more prescriptions annually. The figures in this table refer to hospitals of all sizes and are, therefore, not as meaningful as those in Table 55 in which the hospitals are arranged according to bed capacities.

The range in the number of other inpatient orders is shown by Table 57. Here the most noteworthy finding is that no inpatient drug orders, other than prescriptions, are filled in 35 percent of hospitals. As is evident from Table 57, the percentage distribution of other inpatient drug orders filled is scattered over a wide range, from under 3 thousand to more than 100 thousand. Numerically, the most significant cluster of hospitals represent 16 percent of the total and in this grouping from 10 to 50 thousand inpatient drug orders are filled annually.

3.4 Inpatient Prescriptions per Admission and Patient Day

The number of inpatient prescriptions per admission and per patient day is shown in Table 58. In all short-term hospitals the average number of inpatient prescriptions is 0.9 per patient day and 6.9 per admission. The average length of stay is 7.7 days. We find variations from these averages, however, within the different bed-size categories, most notably in hospitals under 100 beds and those over 500 beds. The findings in the larger hospitals may be due to the fact that these are often medical centers to which more difficult cases are referred for diagnosis and treatment. The procedures involved for a large percentage of patients are time-consuming and result in a longer length of patient stay, 12.4 days in contrast

TABLE 58. Relationship of Inpatient Prescriptions to Patient Admissions, Length of Stay, and Patient Day

Bed Capacity	Total Inpatient Prescriptions	Total Admissions	Length of Patient Stay (Days)	Inpatient Prescriptions per	
				Admission	Patient Day
Short-term					
Under 50	6,942,024	2,315,237	5.4	3.0	0.6
50–99	18,411,000	3,216,808	6.3	5.7	0.9
100–199	38,631,084	5,058,703	7.0	7.6	1.1
200–299	27,417,053	3,852,086	7.7	7.1	0.9
300–399	18,555,641	3,462,003	8.5	8.5	1.0
400–499	10,932,411				
500 and over	17,452,388	2,202,393	12.4	7.9	0.6
All short-term hospitals	138,341,601	20,107,230	7.7	6.9	0.9
Long-term hospitals	28,275,840	1,982,489	30 and over	14.3	<0.5
Total	166,617,441	22,089,719	—	—	—

Source of Data: Table 55 and Hospitals, Guide Issue, Table 2c, pg. 356 (Aug. 1) 1957.

to about 7 to 9 days in a large group of hospitals. This, of course, influences the number of prescriptions per admission. Actually the range of the average number of prescriptions per admission and per patient day in short-term hospitals with 100 beds and over is rather close: 7.1 to 8.5 per admission and 0.6 to 1.1 per patient day.

In contrast to the findings in short-term hospitals, the average number of prescriptions per patient day in long-term hospitals is less than 0.5. This is because of the specialized nature of these hospitals, the greater percentage of medication stocked on nursing units, and the long patient stay. In contrast, we note that the number of inpatient prescriptions per admission in these hospitals is high, 14.3.

3.5 Factors Influencing Dispensing

Almost every other function of the pharmacy has an impact on the dispensing operation. In addition, the dispensing function is influenced by the location, floor space, layout, equipment, and personnel of the department. Deficiencies in these areas reflect on the dispensing function. Closely related to efficiency in dispensing are such items as a formulary system, a manufacturing and prepackaging program, methods of improvement and stock control, methods of pricing and labeling, the number of telephone calls requesting information and the type of information requested, the variety of drugs included as stock on nursing units, the quantity of drug dispensed per prescription. All of these factors, and others, require studied coordination to effect a smooth dispensing operation.

3.6 Improvement of Dispensing Procedures

Four out of 10 chief pharmacists believe that their dispensing procedures could be improved so as to minimize errors in prescription filling. Over half of the pharmacists believe their procedure could be improved but *little* or *not at all* (Table 59, Q 14). One reason for this finding may be that, since over 40 percent of pharmacists do not have additional pharmacists working with them, they do not believe it possible to set up a system whereby their work could be checked by another pharmacist.

TABLE 59. How Much Can Dispensing Procedures Be Improved to Minimize Errors in Prescription Filling

	Number	Percent
Very much to quite a bit	(201)	11
Somewhat	(533)	29
A little to none	(1040)	56
No answer	(79)	4
	(1853)	100

From the viewpoint of patient safety, one of the major advances in dispensing procedures would be the interpretation by the pharmacist of the physician's original prescription or order for the patient. In many hospitals, the pharmacist never sees the physician's original order. In cases where the physician does write an original prescription, he does so only for a limited number of drugs, the other drugs being stock items on the nursing units. In many cases the pharmacist receives only an order transcribed by a nurse or even more commonly by a lay person such as a ward clerk. As a result, errors made by the prescribing physician and errors made in transcribing his orders often go undetected, while the patient receives the wrong drug, the wrong dosage form, the wrong amount of the drug, or is given the drug by injection when oral administration was intended, and *vice versa*. Traditionally and historically it has been the pharmacist's responsibility to see and interpret the physician's original order for the patient. This responsibility has been lost by many hospital pharmacists. Its importance should be reassessed.

3.7 After-Hour Pharmacy Service

Various methods are used to provide pharmacy service in hospitals during evening hours when the pharmacy is closed (Figure 36, Q 16). In most instances, a combination of methods is used; for example, an emergency drug cabinet may be available and, at the same time, a pharmacist may be on call to go to the hospital to supply medication not included in the emergency drug cabinet. The methods which predominate involve the nursing supervisor obtaining

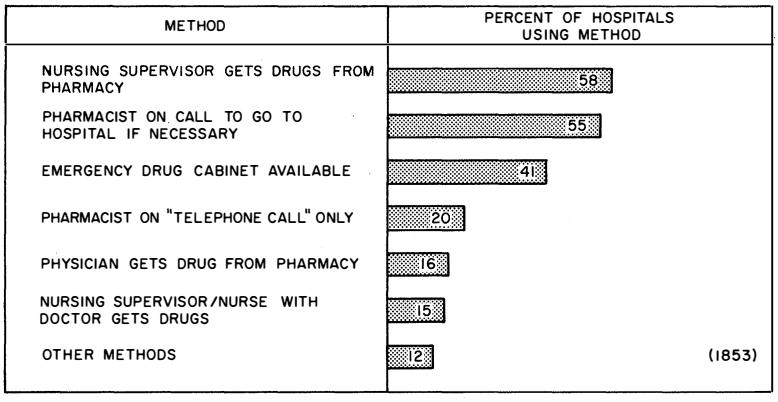


FIGURE 36. Methods Used to Provide Pharmacy Service at Night

drugs from the pharmacy, the use of an emergency drug cabinet, and the availability of a pharmacist on call to come to the hospital if necessary.

The survey does not show the extent to which pharmacists themselves provide after-hour service. Probably, in most situations, the pharmacist comes to the hospital to dispense drugs only "if necessary." If, however, we combine the replies which state that a pharmacist is *on call to come to the hospital* with those which indicate he is *on telephone call,* we note that in 3 hospitals out of 4 a pharmacist is available after-hours for consultation.

TABLE 60. How Satisfactory Do You Think Your Method for Providing Pharmacy Service at Night Is from the Point of View of the Nurse and the Physician

	Number	Percent
Satisfactory	(1366)	74
Somewhat satisfactory	(314)	17
Unsatisfactory	(161)	9
No answer	(12)	<1
	(1853)	100

Regardless of the method employed to provide after-hour pharmacy service, about 3 pharmacists out of 4 believe that nurses and physicians judge it to be *satisfactory* (Table 60, Q 16a). Still, 1 pharmacist in 4 recognizes that the method of providing after-hour service is either *unsatisfactory* or only *partially satisfactory.* This indicates a need for a re-evaluation of responsibilities and methods of providing service during the hours the pharmacy is closed.

In most instances drugs are procured after-hours by nursing personnel. Nurses obtain drugs either from an emergency drug cabinet or from the pharmacy. In such circumstances the responsibilities of the pharmacist are five-fold: (1) to provide an orderly arrangement of the most commonly used drugs together with a cross-indexed file containing nonproprietary and proprietary names; (2) to prepare prepackaged and properly labeled containers of medication so that the nurse does not have to transfer drugs from one container to another or to label containers; (3) to establish procedures for safeguarding other drugs which are not packaged and labeled by the pharmacist; (4) to establish procedures for recording drugs removed from the pharmacy; and (5) to establish procedures whereby the pharmacist can verify that the drug ordered was actually the drug obtained from the pharmacy by nursing personnel.

The bases of the pharmacists' responsibility have been set forth by Archambault who has clearly differentiated between the pharmacy act of drug dispensing and the nursing act of drug administration (*Am. J. Hosp. Pharm. 15*:593 (July) 1958). In essence, Archambault states, nurses are prohibited from any of the following acts which are drug dispensing and can be performed legally by a pharmacist only: (1) the filling or refilling of medication containers; (2) the relabeling of original containers; and (3) the issuance of one or more doses of medications in containers other than the original. On the other hand, nurses may (1) remove a single dose of medication for a specific patient from a container in the pharmacy and administer it to the patient, and (2) remove from the pharmacy medication in its original container or in a properly prepackaged and labeled container and administer the drug to patients. In neither of these instances does transfer of medication from container to container or labeling occur. As Archambault states, "The public health point at issue revolves around patient safety and error control. Should a nurse remove the *single dose* from the wrong container while at the pharmacy (drug administration), there is no greater liability involved than the doing of the same act at a nursing station. However, the filling of a nursing station medication container falls into the pharmacy act of dispensing in that error could injure all patients who subsequently receive medication from that container."

Results of this survey indicate that a large majority of hospitals differentiate sharply between nursing acts and pharmacy acts. Thus, almost 80 percent of hospitals have policies prohibiting nurses from changing drug labels, filling medication containers, and performing other pharmacy acts on nursing units (Table 61, Q 12).

TABLE 61. Status of Hospital Policies or Procedures Regarding Drugs on Nursing Units

	Percent			
Policy or Procedure	Yes	No	Don't Know	No Answer
Procedure for supplying information on a drug to the nurse before she can administer the drug	52	34	9	5
Policy preventing nurses from changing labels, refilling containers, etc., of medications on nursing units	79	15	4	2
Suggested rules or procedures for writing medication orders by physicians so that nurses may properly interpret them	48	30	16	6

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From a professional point of view, as well as that of better patient care, hospitals should provide not only properly labeled prepackaged medication arranged in an orderly manner and well indexed in the pharmacy or in an emergency drug cabinet but, in addition, should arrange for a pharmacist to be available for consultation after-hours. Results of the survey indicate that in 3 hospitals out of 4 the services of a pharmacist are available after-hours for consultation. The presence of emergency drug cabinets in 41 percent of hospitals implies that the pharmacist provides properly labeled prepackaged medication arranged in an orderly manner in a large group of hospitals.

Findings of the survey do not indicate whether the pharmacist provides this type of orderly arrangement of drugs in those cases in which a nursing supervisor or physician routinely obtains drugs after-hours from the pharmacy. Undoubtedly, some pharmacists do provide this type of service but we do not know to what extent they do it.

RECOMMENDATIONS

*7.3 **Improvement of Dispensing Procedures.*** It is recommended that a demonstration project be undertaken designed to improve dispensing procedures in hospitals and to study such matters as increasing efficiency in getting medication to the patient, conservation of the time of nurses, physicians, and pharmacists, elimination of dispensing errors, control of drugs distributed, proper labeling, applications and limitations of automation, and factors influencing the safe and efficient dispensing of medication, including such factors as charges for drugs, prepackaging, unit dose dispensing, preparation of complex parenteral admixtures, and dilution of injectable drugs of limited stability.

*7.4 **After-Hour Pharmacy Service.*** It is recommended that the profession study the problem of after-hour pharmacy service in hospitals and clearly delineate the responsibilities of the pharmacist and the role of nurses in providing medication to patients when the pharmacy is closed.

4

DISPENSING TO OUTPATIENTS

4.1 Extent of Dispensing to Outpatients

About 64 percent of the nation's hospitals employing pharmacists provide outpatient prescription service to patients (Figure 37, SQ 4d). In general, the percentage of hospitals providing this service increases with the size of the hospital. From about 60 to more than 80 percent of short-term hospitals with 200 or more beds provide outpatient prescription service. Several factors may contribute to this high percentage, although these have not been analyzed in this survey. Among these factors may be the growth of outpatient clinics in hospitals with 300 or more beds, the development of medical centers to which indigent and private patients are referred for diagnosis and treatment with subsequent follow-up, the teaching functions of the hospital, the need for adequate control of investigational drugs prescribed for outpatients, the presence of physicians' private offices in the hospital or clinic building, the public demand for more extensive opportunities for ambulatory care, the trend of hospitals to provide complete facilities, including pharmacy, for the treatment of outpatients, and, possibly, the growing importance of outpatient pharmacy service in the economics of the hospital.

Only about 7 percent of short-term hospitals under 50 beds employ a pharmacist. Of those which do, about 88 percent provide outpatient prescription service; however, the actual number offering this service is obviously small. In fact, the existence of an outpatient prescription service may be one of the principal reasons a pharmacist is employed in hospitals under 50 beds. Since, however, 75 percent of short-term hospitals with 100–199 beds and 99 percent of short-term hospitals with 200 or more beds do employ a pharmacist, the number of hospitals with 100 or more beds involved in dispensing medication to outpatients is large.

Not included in Figure 37 are those hospitals which provide outpatient prescription service solely to their professional and nonprofessional employees and staff members as an element in their fringe-benefit program. In other words, these groups were not included in the definition of an outpatient.

The percentage of hospitals, according to bed capacity, which *provides* outpatient prescription service and those *which would like to provide* it, is shown

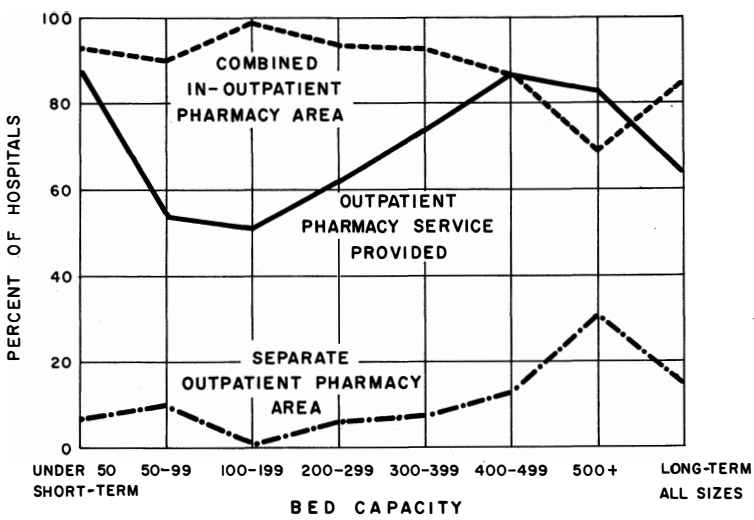
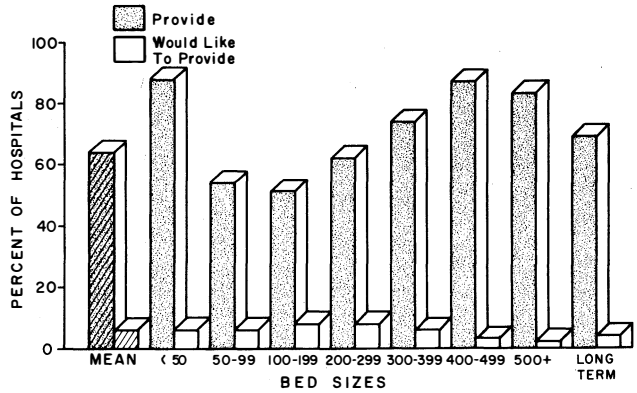


FIGURE 37. Outpatient Pharmacy Service and Its Location in the Hospital

FIGURE 38. Hospital Pharmacists Providing Outpatient Prescription Service



in Figure 38. Here again we see that a high percentage of hospitals with less than 100 beds *which have a pharmacist* provide outpatient prescription service. Over 50 percent of the large short-term hospitals provide outpatient prescription service; this rises to about 90 percent in hospitals with 400 or more beds.

TABLE 62. Outpatient Pharmacy Service in Hospitals with Pharmacists

Bed Capacity	Outpatient Pharmacy Service Provided by Hospitals with Pharmacists		Location of Outpatient Pharmacy	
	Yes (Percent)	No (Percent)	Combined In- and Out-patient Area (Percent)	Out-patient Clinic (Percent)
Short-term				
Under 50	88	12	93	7
50–99	54	46	90	10
100–199	51	49	98	2
200–299	62	38	94	6
300–399	74	26	93	7
400–499	87	13	87	13
500 and over	83	17	69	31
Long-term				
All sizes	69	31	87	13
Average	64	36	89	11

Approximately 5 to 10 percent of additional hospitals in each size range would like to provide outpatient service (Figure 38). If this were done, about 3 out of 4 hospitals employing pharmacists would offer prescription service to outpatients. Table 62 also shows the percent of hospitals which provide outpatient pharmacy service, and the location of the outpatient pharmacy.

4.2 Location of Outpatient Dispensing Area

About 9 hospitals out of 10 combine inpatient and outpatient prescription service in the same general area of the pharmacy (Figure 37). Outpatient prescription service may be separate only in the sense that the pharmacy provides a separate "window" and cashier for outpatients; but the outpatient pharmacy area is actually a part of the inpatient pharmacy. Some hospitals, however, maintain an outpatient pharmacy separated physically from the inpatient pharmacy. About one-third of the hospitals with 500 beds and over have a separate outpatient pharmacy unit. Undoubtedly, the existence of such a relatively large percentage of separate outpatient pharmacies is related to the existence of separate outpatient clinic buildings in these larger hospitals.

4.3 Prescriptions for Indigent vs. Non-Indigent

Approximately 50 percent of the outpatient prescriptions filled by hospital pharmacists are supplied to indigent or partially indigent patients (Table 63).

TABLE 63. Classification of Outpatients Receiving Pharmacy Service 1957

Bed Capacity	Percent of Outpatient Prescriptions for		
	Indigent or Partially Indigent	Private-Pay	Others[1]
Short-term			
Under 50	35	35	30
50–99	42	19	39
100–199	37	44	19
200–299	49	39	12
300–399	53	40	7
400–499	61	25	14
500 and over	55	28	17
Long-term			
All sizes	51	14	35
Average	48	32	20

[1]Primarily federal government-supported patients, i.e., veterans, armed forces personnel and their dependents, also a few patients who possess total outpatient service health plans, and research and total welfare patients.

Approximately 32 percent of the outpatient prescriptions are filled for private pay patients while about 20 percent are furnished to others. The latter include primarily dependents of the federal government such as veterans, armed forces personnel and dependents, subscribers to comprehensive health plans which include outpatient service; patients obtaining medication as part of a research project, and some total welfare patients as well as those unable to pay but not eligible for welfare benefits. Thus, if we combine

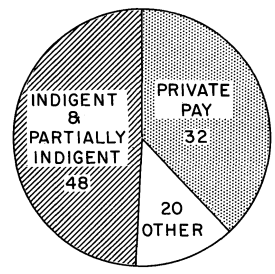
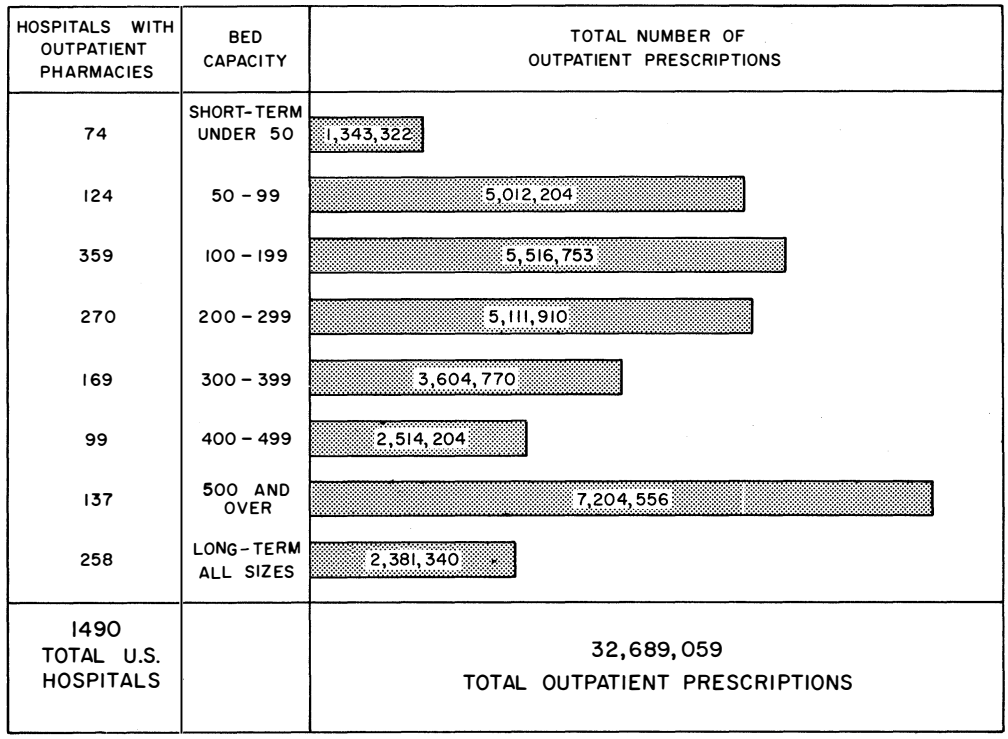


FIGURE 39. Percent Distribution of Prescriptions According to Classification of Outpatients

FIGURE 40. Total Number of Outpatient Prescriptions Filled in Hospitals with Outpatient Pharmacies 1957



the totals for the indigent or partially indigent patients with the "other" category, we find that the cost of about 70 percent of prescriptions dispensed to outpatients is subsidized partially or in full. The percentage distribution of prescriptions according to classification of outpatients is shown in Figure 39.

4.4 Number of Outpatient Prescriptions

More than 32 million prescriptions were dispensed in outpatient pharmacies in 1957 (Figure 40, SQ 4a). The number of outpatient prescriptions dispensed in relation to the bed capacity of the hospital varies in a peculiar, irregular pattern. This is understandable since the number of outpatient visits to a hospital is not necessarily dependent on its bed capacity. Table 64 (SQ 4a) shows the number of outpatient prescriptions dispensed according to size of hospital. The figures given show the average number of prescriptions dispensed, the average deviation from the average, and the range. Here we note, for example, that the average number of outpatient prescriptions dispensed in hospitals with 50–99 beds is over 40,000 while the corresponding number dispensed in hospitals with 300–399 beds is

TABLE 64. Number of Outpatient Prescriptions Filled in Hospitals 1957[1]

Bed Capacity	Hospitals with Outpatient Pharmacy Service	Number of Outpatient Prescriptions per Year			Total Number of Outpatient Prescriptions per Year
		Average Number	Average Deviation	Range	
Short-term					
Under 50	74	18,153	8,769	500 to 50,000	1,343,322
50–99	124	40,421	28,292	500 to 125,000	5,012,204
100–199	359	15,367	11,152	500 to 125,000	5,516,753
200–299	270	18,933	13,000	500 to 225,000	5,111,910
300–399	169	21,330	15,095	500 to 125,000	3,604,770
400–499	99	25,396	17,238	500 to 100,000	2,514,204
500 and over	137	52,588	43,741	500 to 300,000 and over	7,204,556
Long-term					
All sizes	258	9,230	12,750	500 to 125,000	2,381,340
Total	1490				32,689,059

[1]Projected to include all short- and long-term hospitals with full-time pharmacists providing outpatient pharmacy service, Continental U. S. 1957.

only 21,330. Further, the average deviation in the 50–99 bed hospitals is over 28,000 while the deviation in the case of the 300–399 bed hospitals is only about 15,000. In addition, we note that the range of the number of prescriptions filled in both the 50–99 and the 300–399 bed hospitals is the same, 500 to 125,000.

Thus, the record of the number of outpatient prescriptions reported by short- and long-term hospitals in each group arranged according to bed capacity presents an asymmetrical or skewed distribution which shifts to the right. In all cases the distribution is extremely skewed, in some more markedly so than in others. As the value for the average deviation approaches the average value itself, it implies the wide range in which the statistics are reported as well as the arrangement of their relative distribution. Since the curve is skewed to the right, the extreme value of the ranges exerts a marked degree of weight in the value of the average deviation. In those instances where the average deviation exceeds the average value, as in the long-term hospitals, the distribution of the sample is characterized by marked skewness at the higher extremes of the range. Nevertheless, the methods used to calculate the number of outpatient prescriptions take the asymmetrical distribution of the curves into account.

4.5 Outpatient Prescriptions per Visit

The average number of outpatient prescriptions dispensed per patient visit is shown in Table 65. In short-term hospitals with 100 or more beds the range is from about one-third to one and a quarter prescriptions per visit. The average number of prescriptions per visit varies inversely with the bed capacity of the hospital; hospitals with 500 or more beds fill only about 1 prescription per 3 outpatient visits, while 100–199 bed hospitals average one and a quarter prescriptions for each visit. This information should prove helpful in predicting workloads based on anticipated outpatient visits for given periods.

TABLE 65. Average Number of Outpatient Prescriptions Dispensed per Visit 1957

Bed Capacity	Average Outpatient Visits per Year[1]	Average Number of Outpatient Prescriptions per Year	Average Number of Prescriptions per Visit
Short-term			
Under 50	4,125	18,153	4.40
50–99	5,384	40,421	7.51
100–199	12,235	15,367	1.25
200–299	27,594	18,933	0.69
300–499	46,573	22,796	0.49
500 and over	151,055	52,588	0.35
Long-term			
All sizes	8,119	9,230	1.14

[1]Source of information from Hospitals Guide Issue 32:420 (Aug. 1) 1958.

RECOMMENDATIONS

7.5 Commission on Outpatient Dispensing. It is recommended that a commission broadly representative of the profession study the effects the dispensing of prescriptions to indigent and non-indigent outpatients has upon pharmacy as a profession including (1) the role of the hospital pharmacy as an integral unit of essential patient service, (2) the need of the public to have its medications dispensed by pharmacists, (3) opportunities for professional practice in community and hospital pharmacy, (4) the effect the number of community pharmacies and hospital pharmacies has on opportunities for professional practice, (5) the effects upon the profession of the establishment of pharmacies in physicians' office buildings located near the hospital and how these effects differ according to the status of the pharmacist-manager, *i.e.*, hospital employee, corporation employee, or owner, and (6) legal statutes, opinions, and other implications of the law as it affects outpatient dispensing.

5

INSPECTION OF DRUGS

5.1 Inspection of Drugs on Nursing Units

The *Minimum Standard for Pharmacies in Hospitals* states that the pharmacist is responsible for the "necessary inspection of all pharmaceutical supplies on all services" and suggests that, normally, a monthly inspection should be sufficient. Pharmacists are expected to extend their responsibility for drugs beyond the four walls of the pharmacy and to inspect drug stocks on nursing and clinic units, noting expiration dates, storage conditions, gross decomposition, improper labeling, etc.

TABLE 66. Frequency of Drug Inspections by a Pharmacist on Nursing Units

Frequency	How Often Pharmacist Now Inspects (Percent)	How Often Pharmacist Would Like to Inspect (Percent)
Do not inspect	17	2
Every two years	1	<1
Annually	7	1
Semi-annually	10	2
Quarterly	23	10
Monthly	35	39
No answer	7	45
Do not want to inspect	<1	1

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While 6 out of 10 pharmacists inspect drugs on nursing units from 4 to 12 times a year, only about 1 in 3 does it on a monthly basis (Table 66, Q 33). No inspection is carried out by 17 percent of pharmacists while 10 percent inspect semi-annually and 7 percent inspect annually.

When asked how often they would like to inspect drugs on nursing units, 45 percent of the pharmacists did not answer. This lack of response seems to indicate either a lack of interest in performing inspections, lack of time, or an uncertainty of how often inspections should be made. Only 1 percent of chief pharmacists did not want to make inspections.

Pharmacists, because of their special knowledge of drugs, have been assigned responsibility for inspection of medication throughout the hospital. The objective here is to safeguard the patient through the centralization of responsibility for proper labeling, filling of containers, storage conditions, detection of gross deterioration, etc. In general, this responsibility has not been taken very seriously since only 1 pharmacist in 3 carries out inspections on a monthly basis while less than 1 in 4 inspects medications quarterly. Lack of emphasis of this responsibility is further shown by the fact that no inspection is carried out by 17 percent of pharmacists, while another 17 percent inspect only once or twice a year. It is significant that only 4 pharmacists in 10 would like to inspect medication on nursing units on a monthly basis. On the other hand, more than 4 out of 5 pharmacists carry out inspections of drugs on nursing units at some frequency. This indicates a recognition that drug inspections should be done and are a responsibility of the pharmacist.

Although not a finding of the survey, one may postulate that the lack of enthusiasm for this task is related to the time required to perform it on a monthly basis and the difficulty in arranging a time for the inspections mutually satisfactory to representatives of nursing and pharmacy services. Pressures of work within the pharmacy department may discourage pharmacists from attempting the rather time-consuming task of inspection of medication. An added complication is the usual practice of having a representative of the nursing service accompany the pharmacist making inspections. This means that the time of representatives of two busy services is involved. This so increases the tendency to delay inspections that it is difficult to establish them on a regular routine basis. Nevertheless, this is an important professional responsibility of the pharmacist and should be established as a regular part of pharmaceutical service. One of the major obstacles preventing routine inspections of drugs on nursing units would be removed if a program could be developed so that a pharmacist could make the inspection alone, but following policies and procedures agreed upon by the nursing department. The pharmacist would then be more free to establish a definite schedule of routine inspection and could review periodically the results of these inspections with representatives of nursing. Much is to be said, however, in favor of inspections jointly carried out by the chief pharmacist and the director of nursing service because of their effect in emphasizing the importance of the proper handling of medication on nursing units. Representatives of hospital pharmacy and nursing should reevaluate the benefits and importance of this activity.

5.2 Inspection of Drugs in Pharmacy

Nearly 70 percent of pharmacists replying stated that they inspect the drugs in the pharmacy from 4 to 12 times a year (with regard to such things as expiration dates, decomposition, storage conditions, labeling, etc.) (Table 67, Q 33). This question did not elicit information as to the extent of the inspection of drugs, that is, whether the entire inventory of the pharmacy was inspected periodically or whether such inspections were limited to certain groups of drugs, such as biological preparations. The problem of an overall inspection of drugs in the pharmacy is greater than that involved in inspecting drugs on nursing units because of the more extensive stock carried in the pharmacy. The fact that 57 percent of pharmacists did not answer this question indicates either a misunderstanding of the question or confusion as to how often these inspections should be made and how extensive they should be. Only 1 percent stated specifically that they did not want to inspect drugs in the pharmacy.

TABLE 67. Frequency of Drug Inspections in the Pharmacy

Frequency	How Often Pharmacist Now Inspects (Percent)	How Often Pharmacist Would Like to Inspect (Percent)
Do not inspect	6	1
Every two years	<1	<1
Annually	8	2
Semi-annually	10	3
Quarterly	22	11
Monthly	46	23
No answer	7	57
Do not want to inspect	<1	1

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It is general practice in most hospital pharmacies to periodically inspect biologicals and other dated material and to "inspect" other drugs when dispensing. In fact, inspection of drugs in the pharmacy is actually a day-to-day procedure related to the dispensing of prescriptions and other drug orders. This may account for the apparent apathy toward a formal drug inspection. On the other hand, the advantages of a formal inspection of the pharmacy on a periodic, routine basis to audit professional and administrative performance are obvious enough to warrant careful consideration.

RECOMMENDATIONS

7.6 Inspection of Drugs on Nursing Units. It is recommended that representatives of pharmacy and nursing reevaluate the benefits and importance of periodic inspection of drugs in nursing and clinic units and suggest general policies and procedures for carrying out this activity.

7.7 Inspection of Pharmacy. It is recommended that directors of pharmacy service periodically conduct a formalized inspection of the pharmacy department (including drugs) to audit professional and administrative performance and needs. It is further recommended that those findings and suggestions for improvement which require administrative approval be brought to the attention of the hospital administrator in writing.

6

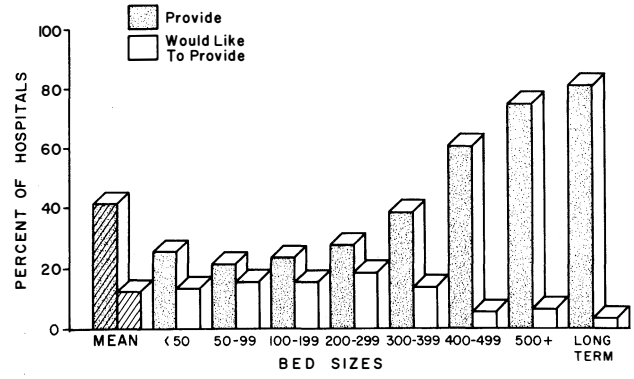
MANUFACTURING OR BULK COMPOUNDING

6.1 Scope of Manufacturing

Approximately 41 percent of 1853 hospital pharmacies operate a manufacturing or bulk compounding program. The relative number of hospital pharmacies operating some type of manufacturing program is shown in Figure 41. Here we note that the percentage doing some type of manufacturing is essentially the same in hospitals up to 300 beds. There is then a gradual increase, with 3 out of 4 short-term general hospitals with 500 or more beds doing some type of manufacturing, and about the same percentage of all long-term hospitals.

An analysis of the activities of the manufacturing program was made from 516 hospitals whose chief pharmacists completed the questions related to this topic (Q 34–38). Some chief pharmacists, in replying to question 15 concerning the scope of services offered, indicated that they had a bulk manufacturing program; however, they did not reply to questions 34–38. Thus, this analysis includes only the 516 pharmacists who answered questions 34–38; it does not include the 244 who replied affirmatively to question 15 but failed to answer questions 34–38.

FIGURE 41. Hospital Pharmacists Providing Bulk Compounding Service



The scope of activity of manufacturing programs in hospital pharmacy is illustrated in Figure 42 (Q 35). Approximately 3 out of 4 pharmacies in this group prepare galenical pharmaceuticals and products not available commercially. There is undoubtedly significant overlapping in these two categories because many pharmaceutical manufacturers have discontinued production of numerous galenical products.

It may seem rather surprising that, in this day of a highly developed pharmaceutical industry, such a large percentage of hospital pharmacies manufacture pharmaceutical products which are not commercially available. This may be explained, perhaps, by the close relationship between physicians and pharmacists in hospitals. Another major factor is the unsuitability of many commercially available dosage forms for the treatment of certain types of unusual illnesses often encountered in hospital practice. Whenever a large group of physicians is concentrated in a hospital with a good pharmacy service, there is a greater tendency for them to request the development of special formulations. These may be either modifications of existing commercially available preparations or they

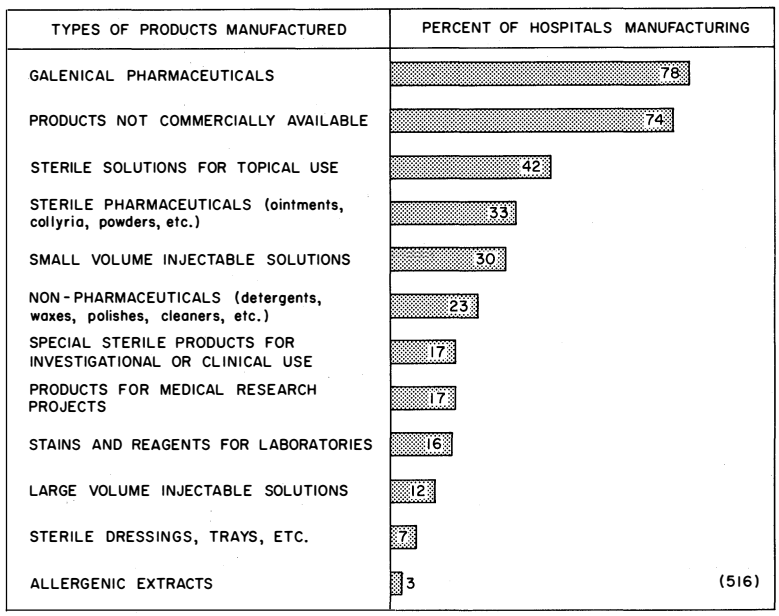


FIGURE 42. Products Bulk Compounded or Manufactured Routinely in Hospitals with Manufacturing Program

may be new combinations or, in some instances, an entirely new product. Whatever form the product takes, its origin lies in the desire of the physician to find a better therapeutic agent for his patient. Thus, many hospital pharmacists have considerable opportunity to utilize the fundamental processes of manufacturing pharmacy and to offer characteristic professional services to the physician and patient. Perhaps pharmacists in the nation's teaching hospitals have this opportunity to the greatest extent because the members of the medical staff are active in teaching and research and, of course, one of the results of research is ideas for new therapeutic agents or new applications for existing agents for which a new pharmaceutical preparation may be required.

The fact that approximately 3 out of 4 hospitals in this group do manufacture products unavailable commercially is important for several reasons. It indicates clearly the need for some type of manufacturing service in hospital pharmacy. In the first place, this manufacturing is based upon need: the physician's need and the need of the patient for special medication; it is not based on savings effected. In fact, manufacturing of this type may not effect any savings. It is, however, a professional service pharmacists may be expected to render. Second, it brings into focus educational needs of hospital pharmacists for training in physical pharmacy, product development, assay and control procedures including instrumental methods of analysis, and related subjects. Third, it is important because it shows the opportunity hospital pharmacists have to practice their profession along traditional lines without limiting their activities to routine dispensing. And fourth, it represents the best type of opportunity for interprofessional relations. Physicians and others of the medical care team enjoy working with pharmacists who can help them with problems in which they have a deep interest. For example, physicians greatly appreciate the assistance pharmacists can give them with the pharmaceutical aspects of an investigational study in which they may be engaged.

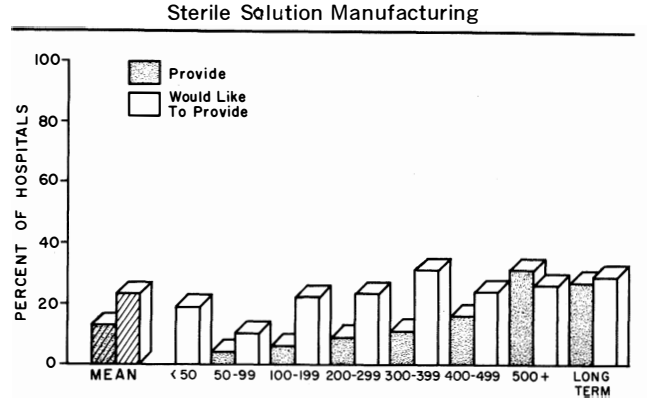
6.2 Production of Sterile Products

Production of sterile products in the pharmacies of this group of 516 hospitals is significant (Figure 42). Thus, we find 42 percent preparing sterile solutions for surgical use, 33 percent preparing sterile collyria, ointments, powders, etc., 30 percent preparing small volume injectable solutions, 17 percent preparing special sterile products for investigational or clinical use, 12 percent preparing large volume injectable solutions, 7 percent preparing sterile dressings, trays, etc., while 3 percent prepare allergenic extracts. Undoubtedly, a significant number of the products for medical research projects prepared by 17 percent of the pharmacies in this group are also sterile products.

Approximately 4 out of 10 pharmacy departments of this group prepare sterile solutions for surgical use. These products are easy to prepare and are in great demand in all hospitals. The demand for sterile water, isotonic sodium chloride and other solutions for topical use, will increase, among other reasons, because of the discontinuance of the outmoded water sterilizers, so-called, in hospital operating and treatment rooms. It is somewhat surprising that only 4 out of 10 pharmacies supply sterile solutions for surgical use. It may be safely assumed that in many hospitals these products are furnished by the central sterile supply department rather than the pharmacy. When these sterile products are prepared in the hospital, there are several good reasons why they should be prepared in the pharmacy, or under the supervision of a pharmacist, even though the actual preparation may take place in the central sterile supply unit. One important consideration is that the pharmacy laws of most states demand that such compounding be done under the supervision of a registered pharmacist, and, more important, a pharmacist is the individual best qualified by education and training to assume this responsibility. Here lies an important area with many potentialities for the pharmacist to increase his professional service to the hospital, and one the profession should encourage.

One out of 3 pharmacies in this group prepares sterile collyria, ointments, powders, etc., and produces small volume injectable solutions. The preparation of sterile medicaments is one of the activities of the pharmacist which demands the use of a broad area of professional knowledge. In addition to the use of general pharmaceutical technics, such activity involves application of bacteriological technics, considers the effect of heat on the finished products, and encompasses packaging problems of great range.

FIGURE 43. Hospital Pharmacists Providing Sterile Solution Manufacturing



The percentage of hospitals employing pharmacists which now *provide* and *would like to provide* sterile solution manufacturing service is shown in Figure 43. Only in short-term hospitals with 500 or more beds, and in long-term hospitals do as many as 1 out of 4 prepare sterile solutions. The greatest significance of the graph lies in the number of hospitals whose chief pharmacists answered that they would like to provide this service.

6.3 Relative Roles of Pharmacy and Central Sterile Supply in Production of Sterile Products

In a supplementary questionnaire an attempt was made to delineate more clearly the relative roles of the pharmacy and central sterile supply departments in the preparation of sterile solutions. This questionnaire did not elicit information on the number or specific types of solutions prepared (Table 68, SQ 2a). The percentages obtained from this supplementary questionnaire cannot be discussed in relationship to the findings obtained in the original questionnaire because the sample used and the information requested differ and, thus, affect the percentage figures obtained so that the results of one questionnaire cannot be related directly to the other.

The role of the pharmacy in the preparation of sterile bulk intravenous solutions is poor when contrasted with that of central sterile supply. For every pharmacy having responsibility for this function there are 1.75 central supply units responsible (Figure 44). In general, the smaller the hospital the more dominant is the role of central sterile supply in the preparation of bulk intravenous solutions. In fact, only in short-term hospitals with more than 500 beds does the

FIGURE 44. Preparation of Sterile Solutions in Hospitals. Relative Roles of Pharmacy and Central Sterile Supply

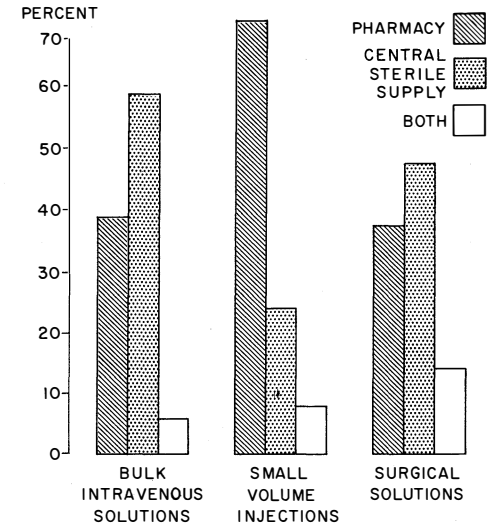


TABLE 68. Relative Roles of Pharmacy and Central Sterile Supply in Manufacturing of Sterile Solutions in Hospitals with Pharmacists

Type of Sterile Solutions	Bed Capacity	Percent of Hospitals with Sterile Manufacturing Program	Manufactured in Hospitals by (Percent)		
			Pharmacy	Central Sterile Supply	Pharmacy-Central Sterile Supply Jointly
Bulk Intravenous Solutions	Short-term				
	Under 50	25	25	75	—
	50–99	16	13	87	—
	100–199	15	6	83	11
	200–299	10	39	61	—
	300–399	15	39	58	3
	400–499	18	38	56	6
	500 and over	24	68	32	—
	Long-term				
	All sizes	5	25	75	—
	All hospitals	12	39	58	3
Small Volume Injections	Short-term				
	Under 50	31	60	20	20
	50–99	16	63	37	—
	100–199	22	61	31	8
	200–299	24	74	23	3
	300–399	27	74	19	7
	400–499	28	74	22	4
	500 and over	45	80	14	6
	Long-term				
	All sizes	27	74	13	13
	All hospitals	27	71	22	7
Surgical Solutions	Short-term				
	Under 50	81	46	54	—
	50–99	82	45	43	12
	100–199	89	31	52	17
	200–299	96	36	50	14
	300–399	96	34	52	14
	400–499	94	39	45	16
	500 and over	88	58	38	4
	Long-term				
	All sizes	86	44	41	15
	All hospitals	93	37	48	15

Less than one percent of other hospital departments, including the blood bank and operating rooms, manufacture some type of sterile solutions.

ratio change more in favor of pharmacy responsibility; even in these larger hospitals the ratio is only 2:1 in favor of the pharmacy. In a very small number of cases, pharmacy and central sterile supply have dual responsibility. In these instances the pharmacy either (1) prepares the solutions to be bottled and sterilized in central sterile supply, or (2) prepares and packages the solutions, although the central sterile supply unit sterilizes them, or (3) prepares a concentrated solution which is then diluted, packaged, and sterilized in central sterile supply. In general, these arrangements between pharmacy and central sterile supply can be assumed, with a high degree of accuracy, to be established to utilize the autoclave located in central sterile supply and thus to economize on equipment. In a very few hospitals bulk intravenous solutions are prepared in the operating room or the blood bank.

Pharmacists play a greater role in the preparation of small volume injections such as procaine hydrochloride solutions, etc. Here the overall ratio is about 3:1 in favor of the pharmacy over central sterile supply; however, the ratio obtained in hospitals with over 500 beds is 6:1. Joint responsibility for the preparation of these solutions exists in some additional hospitals. About 3 out of 4 hospitals purchase their small volume injectable solutions. Again we find that hospitals with less than 50 beds and those with more than 500 beds are more active in the preparation of small volume injections than hospitals of other sizes are.

In the preparation of sterile surgical solutions the role of central sterile supply is dominant; here the ratio is 1 for pharmacy to 1.25 for central sterile supply. Only in hospitals with more than 500 beds does the ratio shift in favor of the pharmacy; here the ratio is about 1.5 for pharmacy and 1 for central sterile supply. In the preparation of surgical solutions, however, dual responsibility plays a greater role and many more additional pharmacies share this function with central sterile supply. In a few hospitals these solutions are prepared in the operating rooms. Only about 1 hospital in 10 purchases surgical solutions.

From these findings it is evident that, in those hospitals in which various types of sterile solutions are prepared, the pharmacist does not exercise his proper role, and the responsibility is assumed by non-pharmacists. This may be due to long standing practices or traditions within the hospital or to a lack of initiative or willingness to assume responsibility on the part of the pharmacist. Even in hospitals where the solutions are sterilized in another department there are, however, strong legal and professional reasons for assigning the responsibility for the quality of these solutions to the pharmacist.

Considering the responsibilities of a professional group to provide service, it is evident that great challenges lie in the preparation of sterile products in the hospital pharmacy. If one considers only sterile solutions for surgical use, sterile eye solutions and possibly a limited number of products for injection, it would appear that all pharmacists should be able to provide this important service. As was pointed out in Chapter VI, about 1 pharmacist in 20 is in charge of the central sterile supply service, in addition to his responsibilities for pharmacy service.

From this discussion, it should not be inferred that hospitals which prepare certain sterile products make all they use and purchase none. On the contrary, it is safe to say that all hospitals, including those preparing solutions, purchase significant amounts of bulk intravenous fluids and of small volume injections. On the other hand, more hospitals produce all the sterile surgical solutions used. This survey did not elicit information on the quantity of these products prepared in hospitals.

6.4 Accomplishments of Manufacturing

The accomplishments of a bulk compounding or manufacturing program in hospital pharmacy are illustrated in Figure 45 (Q 34). These are the objectives the respondents believed their manufacturing program has accomplished. Also shown are the accomplishments pharmacists would like to have

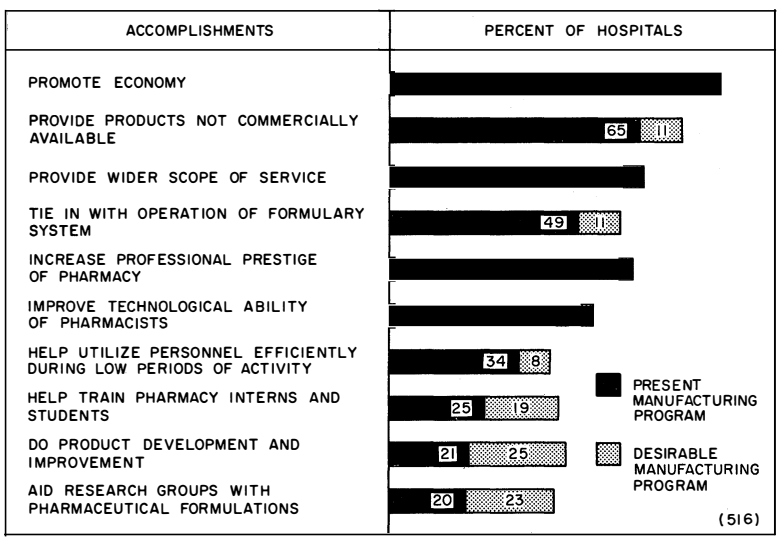


FIGURE 45. Accomplishments of Bulk Manufacturing Program

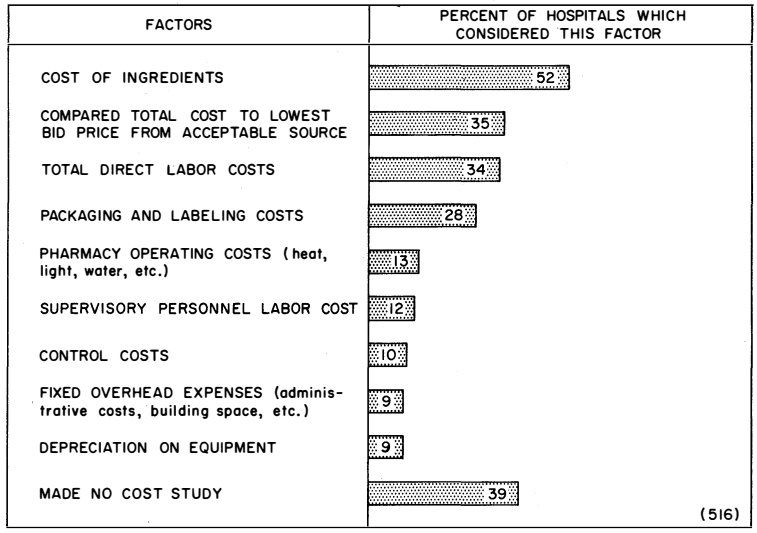


FIGURE 46. Factors Considered in Cost Study on Products Manufactured

their manufacturing programs attain, if they are not now doing so. Thus, a combination of these two values—what the manufacturing program is doing now, and what pharmacists would like to have it do—is significant because it represents an overall attitude of this group of pharmacists toward manufacturing. For example, while 65 percent of respondents stated that their manufacturing program provided products not commercially available, an additional 11 percent said they would like their program to accomplish this objective. Thus, 3 out of 4 (76 percent) respondents believe this is an important objective of a manufacturing program.

Promotion of economy is listed by 78 percent of pharmacists as the leading accomplishment of their manufacturing program. When the additional 8 percent who would like to see their program promote economy is added to 78 percent, the total who have effected economies and who recognize such possibilities is 86 percent.

Traditionally, hospital pharmacists have tended to overemphasize the economic factor in support of a manufacturing program. In the early years of the American Society of Hospital Pharmacists and during several decades prior to its founding, a great many writers attempted to justify the employment of a full-time pharmacist based on the amount that could be saved through a manufacturing program. Economy, it is true, is part of the total picture but its overemphasis has tended to becloud other more important factors. If the factor of economy is ignored completely, there are still many possible combinations of the accomplishments which would justify the establishment of a manufacturing program (Figure 45). For example, one might decide that such a program could be justified to provide a wider scope of pharmaceutical service, to provide products not commercially available, to aid research groups with pharmaceutical formulations, etc.

TABLE 69. Estimated Annual Median Savings Through Manufacturing in Short-Term Hospitals

Bed Capacity	Annual Median Savings	Average Deviation	Range of Savings
100–199	$ 2,490	$ 1,911	<$1000–20,000
200–299	3,256	3,236	<1000–30,000
300–399	4,272	5,147	<1000–50,000
400–499	7,500	6,195	<1000–50,000 and over
500 and over	11,923	12,935	<1000–50,000 and over

516 Hospitals reporting.

Although a large majority of pharmacists believe that their manufacturing program promotes economy, few can prove it. The annual median savings reported by this group of pharmacies varied from $2490 in hospitals with 100–199 beds to about $12,000 in hospitals with more than 500 beds (Table 69, Q 36). The range of savings effected was from less than $1000 to more than $50,000. The average deviation shown in Table 69 also indicates the wide range of savings reported in the survey.

About 33 percent of hospitals of this group with 500 beds or more reported annual savings exceeding $20,000. Only 3 percent of hospitals with 200–299 beds, however, reported savings of over $20,000; savings of this size were reported by 7 percent of hospitals with 300–399 beds and by 14 percent with 400–499 beds.

The wide variation in savings estimated implies great differences in scope of manufacturing in the various hospitals within each size category; in addition, it is probably associated with inadequate records and inadequate cost studies.

The majority of pharmacists do not take into consideration all the factors which should be used in computing a cost study of their manufactured products (Figure 46, Q 37a). In fact, 40 percent do not even make a cost study at all. It may be concluded, therefore, that the majority of pharmacists do not know the value, if any, of their savings. On the other hand, it is reasonable to assume that pharmacists know, in general, whether their entire manufacturing program is costing more money than is saved and whether the added values, such as increased profes-

sional service, warrant the continuation of the program. One may conclude from the findings, however, that cost studies in the manufacturing programs in hospital pharmacy are weak and should be materially strengthened.

In addition to the promotion of economy and the preparation of products not commercially available, which have been discussed, there are several additional accomplishments of a manufacturing program (Figure 45). Two out of 3 pharmacists responding to this portion of the questionnaire indicated that their manufacturing program permitted them to provide a wide scope of pharmaceutical service, or that they would like to have it accomplish this objective. This increased service includes providing products not commercially available, development and improvement of pharmaceutical products, and aiding research groups with pharmaceutical formulations. While only 21 percent of pharmacists listed development and improvement of pharmaceutical products as an accomplishment of their programs, an additional 25 percent want their program to accomplish this objective. This indicates that 1 out of 2 pharmacists in this group appreciates the potentialities in this area. A similar pattern is noted with the objective of aiding research groups with pharmaceutical formulations. Here, 20 percent indicate they are doing this, while an additional 23 percent would like to do it—or more than 4 hospital pharmacists in 10 indicate a need for this type of service.

These increased areas of service, which must be thought of in relationship to the items indicating the scope of activity of manufacturing programs listed in Figure 42, are fundamental to pharmacy as a profession. A profession cannot continue to be a profession unless its practitioners utilize the knowledge and skills which underlie it. Those who are content solely to procure and dispense are slowly but surely creating a new image of pharmacy—an image of a storekeeper, not of a professional man whose training is deeply rooted in the basic sciences.

This matter is closely related to the ability of pharmacists to give increased services to the patient and the medical staff. Those who neglect their professional skills and who have no equipment or facilities to exercise them are seldom in a position to render this increased service. For this reason, it is important that 4 out of 10 pharmacists believe their manufacturing program serves to improve the technological ability of pharmacists because only through constant performance can a profession sustain and improve its technic. Thus, it is significant that more than 1 out of 2 pharmacists wants his program to accomplish this objective (Figure 45).

The training and teaching of pharmacy residents and students is closely related to improvements in the skills of pharmacists. To this portion of the question more than 4 out of 10 pharmacists want their program to accomplish this objective. All of the above factors inevitably lead to increased professional prestige and, while increased professional prestige cannot be used as justification for establishment of a manufacturing program, it is an inevitable result.

Six out of 10 pharmacists believe their manufacturing program does or could tie in with the operation of the formulary system. This relationship is very apparent when one considers that, for example, the dermatology staff of almost every hospital is prone to develop special formulations, all of which may be included in the formulary and manufactured in bulk. A similar, although perhaps not as extensive, relationship exists between the prescribing habits of physicians in other departments and the feasibility of preparing certain products in bulk quantities.

Motivation for increasing or developing the scope of manufacturing within the pharmacy depends greatly upon the size and type of hospital and upon certain attributes of the pharmacist-in-charge. Obviously, greater motivation for manufacturing exists in hospitals where much teaching, training, and research are conducted. In general, less manufacturing will be done in hospitals where these functions are at a minimum. In some cases administrators may oppose the development of a manufacturing program. In many cases the pharmacist may find it easier to purchase everything than to attempt some manufacturing. This decision may sometimes be influenced by the pharmacist's lack of confidence and knowledge or the lack of proper control procedures. But perhaps more important is the tendency of colleges of pharmacy to orient their educational programs toward the needs of community, rather than hospital, practice; the result is that those who enter hospital pharmacy are oriented primarily toward the dispensing function of pharmacy.

It would appear, however, that pharmacists in all types of hospitals could increase their services to patients and medical staffs by having some type of program for the bulk preparation of sterile and/or non-sterile pharmaceuticals. The scope of the individual programs must, of necessity, vary with the size of the hospital, the available staff and facilities and other factors. Much further study should be made of the pros and cons of manufacturing in hospital pharmacies—and especially of the development of a program for the quality control of products produced.

RECOMMENDATIONS

7.8 Manufacturing by Hospital Pharmacists. It is recommended that a study commission be established to evaluate the advantages and disadvantages of increasing the scope of manufacturing or bulk compounding in hospital pharmacies, taking into consideration at least the following factors: (1) opportunities for pharmacists to utilize their professional knowledge and skills in providing better patient service, (2) creating higher motivations for pharmacists to enter hospital practice, (3) facilities required for manufacturing based upon types of products prepared, (4) related control procedures which should accompany manufacturing programs, (5) possible role of other hospital departments in the establishment of a control program, (6) advisability of the national professional organization establishing a central laboratory for

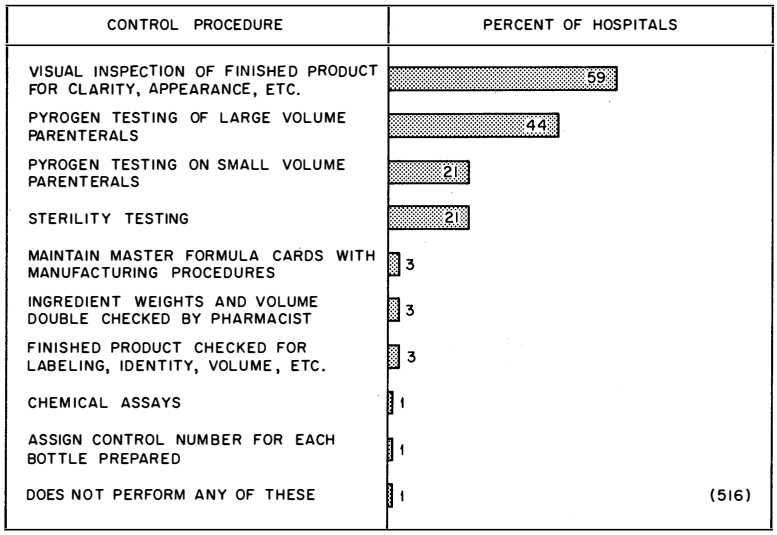


FIGURE 47. Current Practice Regarding Control Procedures on Products Compounded in Bulk

the development and testing of formulations for manufactured products, (7) compilation and publication of recommended tested formulas, (8) special opportunities which exist in hospitals for the pharmacist to assume a greater role in the preparation of sterile products, and (9) relationship between increased or decreased manufacturing and educational and training needs of hospital pharmacists.

7.9 Demonstration Projects in Manufacturing. It is recommended that pharmacies in hospitals of various types and sizes be encouraged to establish demonstration projects in the manufacturing or bulk compounding of pharmaceuticals, together with proper control methods, and that these projects be used as training centers for hospital pharmacists interested in expanding the scope of their service and improving its quality.

7.10 Central Sterile Supply Service. It is recommended that an educational and training program be developed to more fully qualify hospital pharmacists to assume the responsibility for central sterile supply service.

7.11 Responsibility for Sterile Preparations. It is recommended that hospitals be encouraged to assign to pharmacists the responsibility and to provide the necessary facilities for the preparation and quality control of sterile medicinal products produced in hospitals, even when these products are produced in another department.

7.12 Manufacturing Costs. It is recommended that a simplified procedure for determining the cost of products manufactured in hospital pharmacies be developed and that hospital pharmacists be encouraged to maintain such records.

7

CONTROL PROCEDURES

7.1 Current Control Practices

Current practices regarding control procedures on products manufactured or compounded in bulk in hospital pharmacies point to one of the most serious shortcomings of those with manufacturing programs (Figure 47, Q 38). Control procedures are extremely weak. In fact, only 3 percent of hospitals maintain master formula cards, or have ingredients, weights, and measurements checked by another pharmacist, or check the finished product for correctness of labeling, identity, volume, etc. Only about 1 percent performs any chemical assays or even uses a system of control numbers to permit proper checking of the ingredients in the product and the various steps of its preparation.

By comparison, sterile solutions fare moderately well as far as pyrogen and sterility tests are concerned, but evidently control is very poor since in almost all cases the identity and weight of active ingredients are not double checked by a pharmacist nor are chemical assays performed.

Results of this survey indicate the great need for better quality control of pharmaceuticals in hospitals. Obviously, the control program must be tailored to the needs of the individual hospital and the products it produces. In some hospitals it may be necessary to establish a control program step by step, starting with a minimum of equipment and personnel and gradually developing an effective control program. This is worthwhile since it puts into motion the application of the general philosophy of control and leads inevitably to the production of medicines of better quality.

The profession of hospital pharmacy should develop a program to enable pharmacists to more effectively control the quality of drugs produced in hospitals as well as those purchased under certain restricted conditions. One of the major requirements for establishing an effective control program is the availability of well-trained personnel. This, in turn, is related directly to the education and training of hospital pharmacists. This aspect of the control problem is discussed in Chapter IX.

7.2 Records for Manufacturing Control

Good records are an essential part of manufacturing control and few hospital pharmacists maintain them

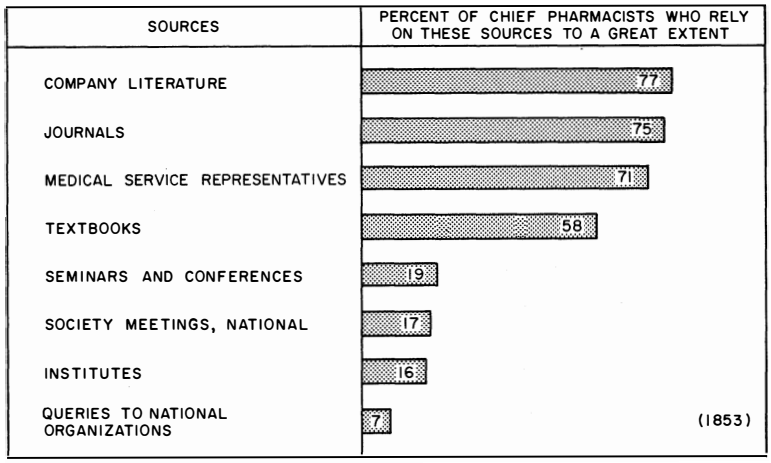


FIGURE 48. Reliance on Various Sources for Current Information Relating to Hospital Pharmacy Practices

(Figure 47). Proper administrative controls in the form of records are the minimum which should be expected of hospital pharmacists. The findings of this survey show that this minimum requirement is seldom fulfilled.

A record of all facts concerning a medicinal preparation provides a basis for determining whether or not the product has been properly made, whether the ingredients of the proper quality are present in the correct amounts, whether the product was properly processed and made in sufficient quantity, and whether it is correctly packaged and labeled. The system of records maintained may differ widely in form. Any system adopted should, however, provide a complete history of the medicinal product; only if the facts regarding a product are available can confidence be placed in a control system.

RECOMMENDATIONS

7.13 Improvement of Control Procedures and Assay Methods. It is recommended that a study commission be established to examine and recommend ways and means of bringing assay methods and control procedures in hospital pharmacies to higher standards, and that this project be given high priority.

7.14 Control Manual. It is recommended that the study commission investigate the need for a manual on recommended control procedures and records for products manufactured and/or prepackaged in hospital pharmacies and that this project be given high priority.

7.15 Demonstration Projects on Control. It is recommended that pharmacies in hospitals of various types and sizes be encouraged to establish demonstration projects in which good control procedures are related directly to products manufactured and dispensed and to a selected number of products purchased.

TABLE 70. Helpfulness of Medical Service Representative in Providing Information Needed by Chief Pharmacists

	Number	Percent
Very helpful to helpful	(1699)	92
Somewhat helpful	(96)	5
Not too helpful to not helpful at all	(24)	1
No answer	(34)	2
	(1853)	100

8

ROLE AS CONSULTANT

8.1 Principal Sources of Information

In this survey an attempt was made to determine the approximate number of times the pharmacist is called upon to provide information on a large number of different categories of information related to drugs. Also determined were the sources of information most frequently used and the number and types of information sources available to the hospital pharmacist. Since much investigational work is carried out on drugs in hospitals, an effort was made to determine both the attitude of the pharmacist and the extent of his participation with physicians in this type of activity. Also considered was the role of the pharmacist in one hospital in providing consulting service on pharmaceutical matters to another hospital lacking the services of a pharmacist.

The principal sources of information upon which hospital pharmacists rely are shown in Figure 48 (Q 39). Approximately 3 out of 4 hospital pharmacists rely *to a great extent* on journals, company literature, and medical service representatives for current information on therapeutics, new procedures and technics, drugs and general background in hospital pharmacy practice. About 6 out of 10 pharmacists rely *to a great extent* on textbooks for this information. Brochures and other literature published by pharmaceutical companies are used *to a very great extent* by hospital pharmacists for supplying information. It may be assumed that this type of information is freely available to hospital pharmacists. In this connection it is noteworthy that more than 9 out of 10 hospital pharmacists find the medical service representative *helpful to very helpful* (Table 70, Q 44).

8.2 Number of Publications Available

The number of publications hospital pharmacists receive or have access to is shown in Table 71 (Q 40).

TABLE 71. Number of Publications Hospital Pharmacists Receive or Have Access to in the Hospital

Publications	Percent of Pharmacists Receiving				
	Less Than 4	4–6	7–10	More Than 10	No Answer
Hospital journals	62	21	4	2	11
Pharmaceutical journals	45	36	9	3	7
Pharmacology and medical journals	54	12	8	10	16
References, texts, and other publications	29	19	15	25	12

TABLE 72. Attitude of Chief Pharmacists Toward Adequacy of Number of Publications Received

Publications	Percent of Pharmacists Who		
	Receive an Adequate Number	Would Like to Receive More	No Answer
Hospital journals	75	14	11
Pharmaceutical journals	80	10	10
Pharmacology and medical journals	61	23	16
References, texts, and other publications	65	21	14

As noted, pharmaceutical and hospital journals are more available than are pharmacology and medical journals, textbooks, and other publications. More than 7 out of 10 hospital pharmacists believe they receive an adequate number of hospital journals, while 8 out of 10 believe they receive an adequate number of pharmaceutical journals (Table 72, Q 42a). More than 20 percent of hospital pharmacists *would like to receive more* pharmacology and medical journals.

It appears that relatively few hospital pharmacists make significant use of references, texts, and other publications (Table 71). More than 6 in 10 believe they have an adequate number, while 2 in 10 would like to have more. It is surprising that more than 3 out of 10 hospital pharmacists have less than four references or texts available, while an equal number have ten or less references or texts.

It is difficult to understand why hospital pharmacists do not have access to more journals and reference texts in the hospital library. Even the smaller hospitals possess a sufficient library to have enabled pharmacists replying to the questionnaire to indicate access to many more journals and texts than is shown by this survey. True, a number of journals and texts should be available in the pharmacy department itself if they are to be utilized to the fullest extent. It is not unreasonable to assume that every professional person would subscribe to some journals, or receive them through his membership in professional organizations, and purchase some textbooks even if they are not supplied by the hospital. One is inclined to conclude that many hospital pharmacists do not appreciate the value of the literature as an aid in enhancing the professional services of pharmacy.

Sixty-one percent of the hospitals reported having drug reference books, in addition to a formulary or drug list, available on nursing units (Q 21).

8.3 Service to Hospitals without a Pharmacist

One aspect of consulting is providing advice on pharmaceutical matters to staffs of hospitals without a pharmacist. While only about 2 pharmacists in 10 provide this service, almost 7 out of 10 would like to provide it (Tables 73 and 74, Q 48 and 48a). These figures do not include pharmacists who are members of a sisterhood. These findings indicate that small hospitals without a pharmacist have a large untapped source of advice on pharmaceutical problems. This subject is discussed in Chapter X.

8.4 Consultant on Drugs

Hospital pharmacists are called upon to provide a wide range of information on drugs. The types of information requested most frequently concern dosage, dosage forms, and pharmacological data (Table 75, Q 45). It will be noted that 74 percent of hospital pharmacists are requested to provide information on dosage at a frequency which ranges from *several times a day* to *several times a week;* 68 percent are requested to provide information on dosage forms, and 54 percent are requested to provide pharmacological data with the same frequency. Several other types of information are requested less frequently; still, more than 1 hospital pharmacist in 4 is asked to provide information related to side reactions and contraindications and comparison of potency of products *several times a day* to *several times a week.* Items of information requested least frequently include chemical data on drugs, comparisons of costs and efficacy of products, and toxicological information.

TABLE 73. Are Chief Pharmacists Called Upon to Provide Consulting Assistance on Pharmaceutical Matters to Hospitals without a Pharmacist?

	Number	Percent
Yes	(378)	22
No	(1277)	75
No answer	(44)	3
	(1699)[1]	100

[1]Excludes Sister Pharmacists.

TABLE 74. Attitude of Chief Pharmacists Toward Rendering Consulting Assistance to Hospitals without a Pharmacist

	Number	Percent
Would like to	(1141)	67
Indifferent	(146)	9
Would not like to	(200)	12
No answer	(212)	12
	(1699)[1]	100

[1]Excludes Sister Pharmacists.

TABLE 75. Approximate Number of Times Pharmacist Is Called Upon to Provide Information on Specific Drugs

Information on	Percent of Pharmacists Indicating That They Are Called Upon				
	Several Times				
	a Day	a Week	a Month	Less Often	No Answer
Dosage	35	39	16	7	3
Dosage forms	32	36	17	8	7
Pharmacological data	18	36	27	13	6
Toxicological information	3	14	32	43	8
Side reactions and contraindications	6	23	36	29	6
Comparison of potency of products	5	21	29	37	8
Comparison of efficacy of products	3	14	26	47	10
Cost comparison of similar products	4	14	25	48	9
Chemical data on drugs	3	12	24	52	9

1853 Hospitals reporting.

While the hospital pharmacist is now being utilized as a consultant to a considerable extent, there are both positive and negative factors which modify the number of requests for information from him. For example, the presence of hospital formularies, supplementary drug monographs, and various types of drug bulletins on all nursing and clinic units reduces the need to call the pharmacist for information. Formularies, drug monographs and drug bulletins represent sources of information prepared by or with the cooperation of the pharmacist and thus, his contribution through these media is significant.

Negative factors include the 1 out of 10 pharmacists who does not want to provide a drug information service. They also include those who would like to give such service but have failed to prepare themselves for it by keeping current with recent developments. This, of course, leads physicians to lack confidence in the pharmacist's ability. Also, one must not overlook the influence of medical service representatives. The tempo of detailing in hospitals has increased enormously during recent years as the percentage of the ethical drug market in hospitals has continued to rise sharply. The large number of detailmen, trained especially for institutional work, calling on hospitals certainly modifies the number of requests for information directed to the hospital pharmacist. On the other hand, their presence places into even sharper focus the need for the hospital pharmacist as a source of unbiased information. Thus, supplying information on drugs is an important responsibility of the hospital pharmacist.

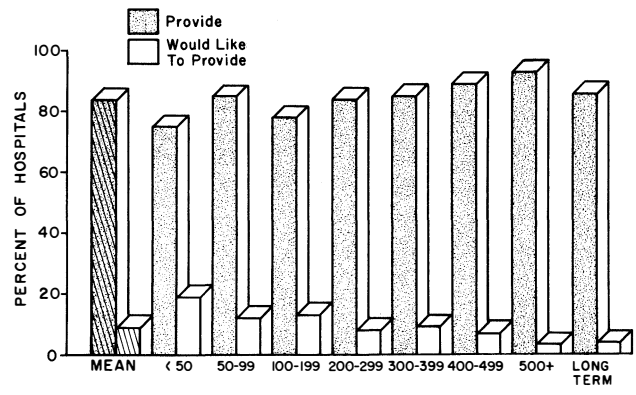
The percent of hospitals in which pharmacists *provide* and *would like to provide* drug information is shown in Figure 49. This service is provided now by a very high percentage of pharmacists. Most pharmacists who do not offer this service would like to do so. It was not possible in this survey to determine the depth of knowledge required by the hospital pharmacist in his role as a consultant. In this connection, however, the findings are interesting since approximately 7 out of 10 chief pharmacists feel that if they had received a well planned sequence of courses in the biological sciences they would be more helpful to medical and nursing staffs in supplying information on drugs (Table 76, Q 45a). The increase in number and complexity of modern drugs indicates a need for hospital pharmacists to receive a more extensive educational background in the biological sciences. In view of the frequency of demands upon hospital pharmacists to furnish a broad range of information on drugs to physicians, nurses and others, it would be well for the profession to review the adequacy of education in pharmacology and other biological sciences for hospital pharmacists. Some of the basic needs in this area are discussed in Chapter IX.

TABLE 76. If Chief Pharmacists Had Received a Well-Planned Sequence of Courses in the Biological Sciences, Could They Be More Helpful to Physicians and Nurses in Supplying Information on Actions, Uses, Side Effects, Etc., of Drugs

	Number	Percent
Yes	(1252)	68
No	(332)	17
No answer	(269)	15
	(1853)	100

One of the factors that undoubtedly makes it difficult for hospital pharmacists to expand their roles as consultants is time. To be well informed takes time, and it requires time to establish a good filing system and keep it current. It requires time to work with physicians on investigative matters and to offer one's services to other hospitals. Nevertheless, one may reasonably expect the busy pharmacist, like the busy physician, to do much reading of professional literature outside of working hours. In the final analysis, a well-trained pharmacist keenly interested in his profession will find a way to keep abreast and will, as a result, prove a valuable consultant to those who seek his counsel. Within the hospital environment the opportunities are great for the pharmacist to assume

FIGURE 49. Hospital Pharmacists Providing Drug Information



an active role in furnishing drug information, assisting in the evaluation of investigational drugs, and evaluating pharmaceutical dosage forms.

One can say with documentary evidence that there is a good opportunity for the pharmacist to serve an important role in the hospital as a source of information on drugs. Also, one may say that the hospital pharmacist of today has made a good start in identifying himself as an expert on drugs and is gaining in stature through these efforts. On the other hand, there is much room for improvement and one of the philosophic goals of hospital pharmacists should be a constant expansion of this service.

RECOMMENDATIONS

7.16 Role as Consultant. It is recommended that hospital pharmacists more fully recognize the importance of their role as consultants on matters pertaining to drugs, that they commit themselves to the task of improving their ability to assume this role, and that they make efforts to assemble and organize the bibliographic resources to enable them to perform this function properly and expeditiously.

7.17 Drug Information Center. It is recommended that drug information centers be established in hospital pharmacies of appropriate size to provide comprehensive pharmaceutical and drug information related to patient care, teaching and research to the medical and allied staffs.

9

TEACHING ACTIVITIES

9.1 Extent of Teaching Activities

Approximately 1 out of 4 chief pharmacists is engaged in teaching activities in addition to other departmental functions (Figure 50, Q 47). A significant number of hospital pharmacists teach student and graduate nurses. This represents the greatest contribution of pharmacists to the hospital's educational program. Thus, 402 pharmacists teach student nurses and, of these, 177 give a complete course, 102 give lectures periodically, while an additional 123 give one or two lectures of a course (Table 77, Q 47). Graduate nurses are given instruction by 368 chief pharmacists, although, undoubtedly, far fewer complete courses are given to this group.

Instruction to medical students is given by 74 chief pharmacists. Of these, only 3 give a complete course while 25 lecture periodically and 46 give one or two lectures in a course.

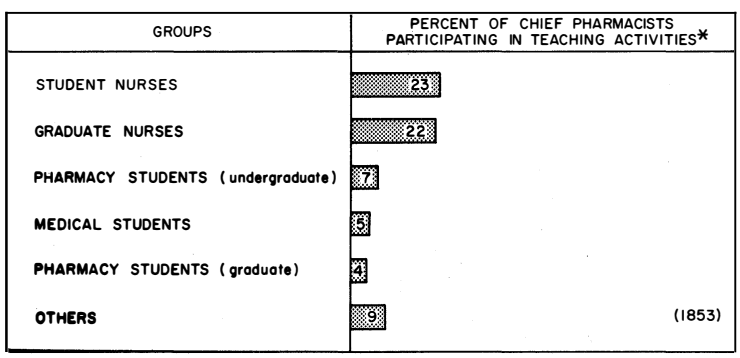
Hospital pharmacists participate to some extent in the education of graduate and undergraduate students of pharmacy. Here 46 chief pharmacists give complete courses to graduate and undergraduate students, or both, while a like number lecture periodically to these students. In addition, 41 chief pharmacists give one or two lectures in a course to graduate and undergraduate pharmacy students.

A total of 136 chief pharmacists lectures to other groups in the hospital. Of these, 18 give complete courses, 68 give lectures periodically, while 50 give one or two lectures in a course. These are, presumably, to resident and other physicians, medical interns, and others.

Not included in the above figures are those respondents who indicated that they participate in teaching activities but did not specify the extent of their teaching. Thus, it is significant that an additional 48 chief pharmacists participate in the teaching of undergraduate students. Addition of this number to those who specified the time engaged in teaching would increase the number who have some teaching responsibility for undergraduate pharmacy students to 128.

The percentage of hospitals in which pharmacists *provide* and *would like to provide* teaching services is shown in Figure 51. More than 50 percent of chief pharmacists either provide this service or would like to do so. Among general hospitals, the percentage of chief pharmacists who teach increases with the size of the hospital. In hospitals with 500 or more beds, more than 4 out of 10 chief pharmacists teach. About 1 out of 3 pharmacists in long-term hospitals teaches.

Hospital pharmacists as a group, however, have made only a beginning in teaching activities. The vast majority of chief pharmacists are not associated in any way with teaching activities. Generally, there is ample opportunity in almost every hospital for pharmacists to participate in teaching activities at least to some extent. The pharmacist does have



* Extent of activity varies from teaching a complete course to presenting one or two lectures periodically.

FIGURE 50. Participation of Chief Pharmacists in Teaching Activities

TABLE 77. Chief Pharmacists' Participation in Teaching Activities

Group	Number of Chief Pharmacists Responsible for: Complete Course	Lectures Periodically	1 or 2 Lectures in a Course	No Answer How Much	Do Not Teach	No Answer
Medical students	3	25	46	8	1580	191
Student nurses	177	102	123	18	1269	164
Pharmacy students (graduate)	22	20	13	18	1568	212
Pharmacy students (undergraduate)	26	26	28	48	1515	210
Graduate nurses	9	213	146	33	1266	186
Others	18	68	50	27	1295	395

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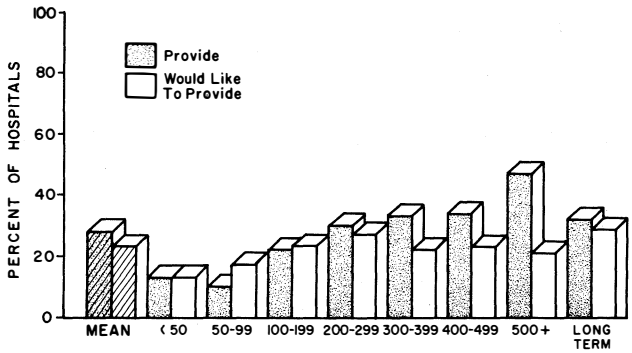
FIGURE 51. Hospital Pharmacists Providing Teaching Programs



specialized knowledge which he can share with nurses, physicians, students of pharmacy and medicine, and others. Teaching activities tend to enhance the role of the hospital pharmacist as a consultant, to strengthen interprofessional relationships, to improve the pharmacist's communicative skills, and, of course, such activities contribute materially to the total educational program of the hospital. Greater effort should be made by the profession to encourage greater participation by hospital pharmacists in teaching activities.

RECOMMENDATIONS

*7.18 **Expand Teaching Role.*** It is recommended that hospital pharmacists expand their teaching role within the hospital and its associated units.

*7.19 **Organized Resource Material for Teaching.*** It is recommended that a study group examine the need for and recommend means of developing organized resource material, such as outlines for lectures or for courses, to enable hospital pharmacists to improve the quality and extent of their participation in the teaching program of the hospital.

10

INVESTIGATIONS AND SPECIAL STUDIES

10.1 Assisting in Investigational Projects

Related to the role of the hospital pharmacist as a consultant is his attitude toward assisting the medical staff in pharmaceutical aspects of investigative work. Almost 8 out of 10 hospital pharmacists enjoy this type of activity and believe it should be a part of their job (Tables 78 and 79, Q 50a and 50b). Both the practice and the attitude are commendable and augur well for the profession.

Although the survey made no study of publications by hospital pharmacists, one would expect that the practice of hospital pharmacists assisting medical personnel in matters involving investigative work might reasonably lead to more joint publications by members of the two professions than is now evident in the literature. One may postulate that hospital pharmacists do not become deeply enough involved in the investigational work to warrant joint authorship of papers.

TABLE 78. Attitude of Chief Pharmacists Toward Liking to Prepare Special Formulations or to Assist Medical Staff in Other Pharmaceutical Problems Involving Investigative Work

	Number	Percent
Very great deal to quite a bit	(1119)	60
Some	(354)	19
A little to none	(202)	11
No answer	(178)	10
	(1853)	100

TABLE 79. Do Chief Pharmacists Think That Preparing Special Formulations or Assisting Medical Staff in Other Problems Involving Their Investigative Work Should Be Part of the Pharmacist's Job?

	Number	Percent
Yes	(1464)	79
No	(167)	9
No answer	(222)	12
	(1853)	100

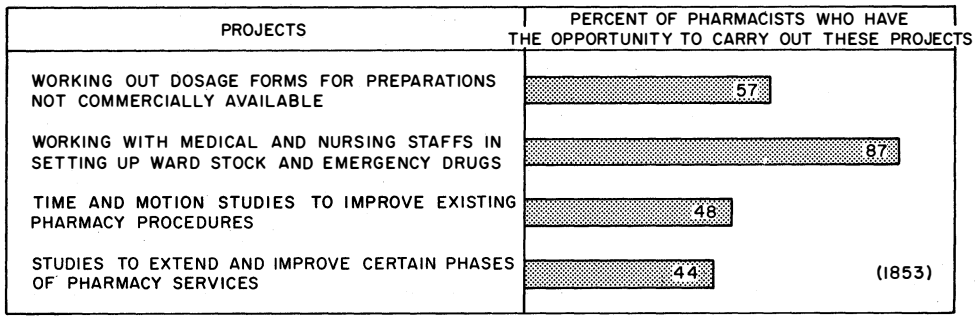


FIGURE 52. Opportunity Chief Pharmacists Have to Carry Out Research or Developmental Projects

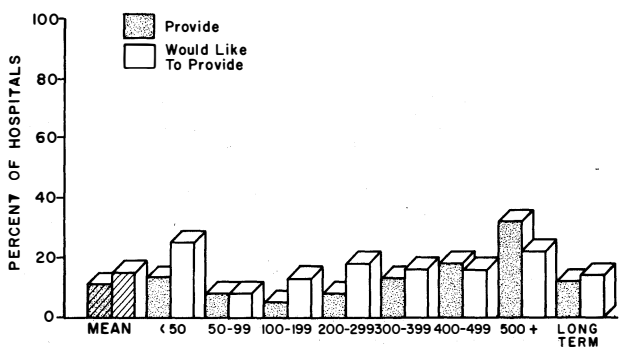
10.2 Opportunities and Attitudes

Investigations and special studies form one part of the professional and administrative activities of the hospital pharmacist. Almost 6 out of 10 chief pharmacists have opportunities to work out dosage forms for pharmaceutical preparations not available, while more than 4 in 10 have opportunities to carry out projects to extend and improve certain phases of pharmacy service (Figure 52, Q 49). About one-half of chief pharmacists receive requests from the medical staff for special formulations and related problems while about half state that they have little or no opportunity for this service (Table 80, Q 50).

TABLE 80. Requests Received by Chief Pharmacists from Medical Staff to Prepare Special Formulations or to Assist in Other Pharmaceutical Problems Involving Their Investigative Work

	Number	Percent
Very often to often	(313)	17
Sometimes	(623)	34
Very seldom to never	(873)	47
No answer	(44)	2
	(1853)	100

FIGURE 53. Hospital Pharmacists Providing Product Development Service and Research Activities



The attitude of chief pharmacists toward this type of activity is revealed by Tables 78 and 79. The majority of chief pharmacists (6 out of 10) like this type of activity a *great deal* or *quite a bit;* almost 80 percent feel that this activity should be a part of the hospital pharmacist's job. Figure 53 shows the percentage of hospitals in which the chief pharmacist either provides or would like to provide this service. Greatest activity in product development and research takes place in hospitals with 500 or more beds. More chief pharmacists want to provide this service than are now doing so.

Product formulation and assistance with other problems of a pharmaceutical nature, including a role in the evaluation of drugs and dosage forms, represent tangible professional contributions by the hospital pharmacist and should be encouraged. To carry out these activities at the highest level, the hospital pharmacist needs better than average pharmaceutical education and training, and requires proper equipment and facilities with which to work. He also needs time to devote to these activities, which are inherently time-consuming. Educational and training needs of the hospital pharmacist for these and other activities are discussed in Chapter IX.

RECOMMENDATIONS

7.20 Investigation and Research. It is recommended that hospital pharmacists, particularly those in teaching hospitals, make professional and administrative investigation and scientific research formal objectives of their departments and take the steps necessary to carry out these objectives.

7.21 Full-Time Research Positions. It is recommended that pharmacists associated with research hospitals develop research programs and find means of employing a full-time research pharmacist to carry them out.

7.22 Collaborative Investigation and Research. It is recommended that hospital pharmacists become more active in collaborative research projects with the medical and allied professional staffs and with administrative personnel of the hospital.

11

RELATIONSHIPS WITH MEDICAL AND NURSING STAFFS

TABLE 81. How Chief Pharmacists Rate the Working Relationship Between Pharmacy and Other Hospital Departments

Department	Rating in Percent			
	Very Good to Good	Fair	Not Too Good to Very Poor	No Answer
Administration	94	4	1	1
Medical staff	85	10	3	2
Nursing department	88	10	1	1
Business office	91	5	1	3
Purchasing agent	81	5	2	12
Other hospital departments	91	4	<1	5

1853 Hospitals reporting.

TABLE 82. Interest of Administrator, Medical and Nursing Staffs in Working with Chief Pharmacist to Improve the Quality of Pharmacy Service

Degree of Interest	Percent		
	Administrator	Medical Staff	Nursing Staff
Interested	92	79	85
Indifferent	5	13	10
Not interested	2	6	4
No answer	1	2	1

1853 Hospitals reporting.

11.1 Status of Relationships

Chief pharmacists rate as highly satisfactory their working relationships with the members of the medical staff and nursing department with more than 8 out of 10 indicating that their working relationships are *good* to *very good* (Table 81, Q 7). Ten percent rate their working relationships as only *fair*, while only a small percentage consider their relationships *not too good to very poor*.

Since pharmacists dispense drugs which are prescribed by physicians and administered by nurses, it is essential to have good working relationships among members of the respective professions. Upon these relationships depend the smooth functioning of the formulary system in hospitals, the fostering of rational drug therapy, the safe and efficient dispensing and administration of drugs, and other patient services involving the use of drugs. One may conclude from these findings that pharmacists, nurses, and physicians work well together as a team and that, as a member of this team, the pharmacist is in a position to stimulate cooperative responses from other members of the team in matters in which he shows a special competence. This is further corroborated by the findings that chief pharmacists believe that 8 out of 10 medical and nursing staffs are interested in helping to improve the quality of pharmaceutical service to patients, and that the pharmacy department is well respected by its professional colleagues (Table 82, Q 7a, 8). Working relationships arise to a great extent from effective communications and this matter was also studied.

11.2 Methods of Communication Employed

Chief pharmacists use several methods of communicating with the medical staff when they wish to present recommendations or to obtain approval of a proposal (Table 83, Q 6). The three methods employed most often are those of (1) discussing the problem first through the pharmacy and therapeutics committee and transmitting the recommendation to the medical staff, (2) asking the administrator to present the problem to the medical staff, or (3) discussing the problem informally with members of the medical staff. Approximately 62 percent of chief pharmacists indicate that use of the committee is their first, second, or third choice (Table 84, Q 6). The indirect method of approaching the medical staff through the administration is used as the first, second, or third choice by about 71 percent of chief pharmacists; about 67 percent use the less formal method of discussing problems informally with certain members of the medical staff. The direct method of sending a general communication to the medical staff is used by 26 percent of chief pharmacists as their first, second, or third method of communication; 19 percent of them personally present problems directly at a medical staff meeting. The "not mentioned" column in-

TABLE 83. Methods of Choice Chief Pharmacists Use to Communicate with Medical Staff

Method of Communication	Percent Frequency of Choice of Method Used				
	First	Second	Third	Not Mentioned	No Answer
Discussing problem first through committee, then passing recommendations to medical staff	37	18	7	35	3
Asking administrator to present problem to medical staff	28	18	15	36	3
Discussing problem informally with members of medical staff	20	29	18	30	3
Presenting problem at medical staff meeting yourself	4	6	9	78	3
General memo to medical staff	3	7	16	71	3
Some other method	3	1	2	93	1

1853 Hospitals reporting.

TABLE 84. Pharmacists' Satisfaction with Methods Used to Communicate with Medical Staff

Method of Communication in Order of Frequency	Percent of Pharmacists Satisfied with Their First Choice		
	Very Satisfied to Satisfied	Somewhat Satisfied	Not Very to Not At All Satisfied
Discussing problem first through a committee, then passing recommendation to medical staff	82	14	4
Asking administrator to present problem to medical staff	66	18	15
Discussing problem informally with members of medical staff	68	24	8
Presenting problem at medical staff meeting yourself	83	11	6
General memo to medical staff	87	11	2
Some other method	74	13	13
Average percent of pharmacists' satisfaction	77	15	8

dicates that the particular method of communication was not among the first, second, or third frequency of choice employed. For example, sending a general memorandum to the medical staff was not employed by 71 percent of the respondents as either first, second, or third choice.

In general, chief pharmacists do not limit themselves to any one method of communication but, rather, use a combination of methods. This is to be expected in a complex organization such as a hospital where many different types of problems must be brought to the attention of the medical staff and where there are differences in the organizational structure of hospitals.

While about 75 percent of hospitals have pharmacy and therapeutics committees, only 37 percent of chief pharmacists use the committee as the method of choice to communicate with the medical staff on professional problems. One of the objectives of the pharmacy and therapeutics committee is to serve as the organizational line of communication or liaison between the medical staff and the pharmacy. To make the committee more effective and to give the pharmacist a major responsibility for its functioning, the pharmacist is usually designated its secretary. The relatively small percentage of pharmacists who use the pharmacy and therapeutics committee as the medium of choice in dealing with the medical staff on professional problems indicates that pharmacists fail to appreciate the true significance of the committee and their role in its deliberations. Since he serves as the committee's secretary, the pharmacist must also share major responsibility for the relatively large percentage of inactive committees (see Chapter VIII).

Too few pharmacists appear to appreciate fully the opportunities afforded by the pharmacy and therapeutics committee for improving and extending their professional services. This and other facets of the pharmacy and therapeutics committee will be discussed more fully in Chapter VIII.

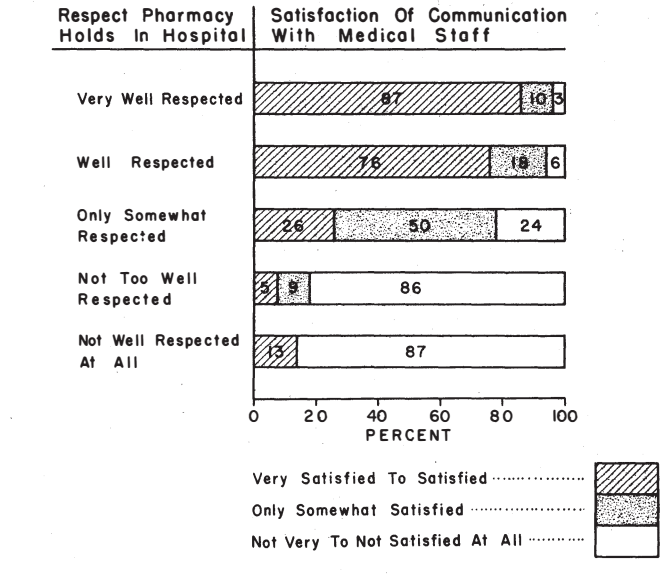
It is essential and wise to discuss matters informally with selected, influential members of the medical staff and this method of communication certainly has an important place. Many individual problems can be resolved by this method but, when the problem involves other members of the medical staff as well, such discussions should be followed by utilizing more formal methods of communication so that the solutions agreed upon will be a matter of official record and policy.

Evidently many pharmacists find it valuable at times to deal with the medical staff through the administrator. Although the types of problems with which this method is used were not determined, one may postulate that those involving overall hospital policies regarding drugs, particularly those with financial aspects, could be handled effectively by this method because of the administrator's interest and responsibilities in these areas.

A relatively small but highly significant number of chief pharmacists prefers direct communication with the medical staff, either at a staff meeting or by memorandum. Use of direct methods implies that the pharmacist has a good image within the organization and that he is well accepted professionally by the medical staff.

The majority of chief pharmacists appear quite well satisfied with their method of choice in communicating with the medical staff regardless of the method used (Table 84). Greatest satisfaction is shown by those dealing directly with the medical staff at one of its meetings, or by memoranda, or working through the pharmacy and therapeutics committee. Somewhat less satisfaction is expressed by those who deal

FIGURE 54. Relationship Between Respect Pharmacy Holds in Hospitals to Pharmacist's Satisfaction with Communications to Medical Staff



through the administrator or who discuss matters informally with members of the medical staff. Understandably, those methods which permit the pharmacist an active, direct approach tend to yield more satisfaction.

Undoubtedly, each of the methods of communication discussed is essential and has its place. However, pharmacists should be encouraged to develop further the great possibilities which exist in their role as secretary of the pharmacy and therapeutics committee, a role which, if well played, leads naturally to appearances at medical staff meetings and written memoranda to the medical staff, the result of which will be more effective professional collaboration.

The relationship between the respect with which pharmacists believe their department is held and their satisfaction with their communication with the medical staff is shown in Figure 54. There is a direct relationship. Those who feel their department is *very well respected* also tend to be *very satisfied* to *satisfied* with their communications. On the other hand, those who feel their department is *not well respected at all* tend to be *not very* to *not satisfied at all* with their communications. This finding has important implications related to the management or administrative capabilities of the pharmacist and his ability to use effective management tools to achieve professional goals.

RECOMMENDATIONS

7.23 Communications with Medical Staff. It is recommended that hospital pharmacists be encouraged to utilize more fully the pharmacy and therapeutics committee in improving formal communications and relationships with the medical staff.

7.24 Communications with Nursing Staff. It is recommended that hospital pharmacists consider the desirability of a joint pharmacy-nursing committee to improve communications and strengthen interprofessional relationships in their hospitals.

VIII

Pharmacy and therapeutics committee and the formulary system

1

INTRODUCTION

1.1 Origins

The formulary system and hospital formularies have existed in this country since the days of the American Revolution when the *Lititz Pharmacopoeia* was published in 1778 for use by the Continental forces. It was not until 1816, however, that a formulary for a private civilian hospital was compiled and it is noteworthy that the *Pharmacopoeia of the New York Hospital* was published "under the authority of the physicians of that institution" four years prior to issuance of the *United States Pharmacopeia.* In fact, much later, it was Dr. W. J. Stainsby, a physician at New York Hospital, who, with the pharmacologist Dr. Robert A. Hatcher, formulated the first guiding principles for the operation of the formulary system. The recommendations of Stainsby and Hatcher were published in both the *Journal of the American Medical Association* (*101*:1802 (Dec. 2) 1933) and the *Journal of the American Pharmaceutical Association* (*22*:1281 (Dec.) 1933), and greatly influenced the development of formularies in American hospitals. The principles set forth by these men have since served as a guide to the operation of the formulary system in American hospitals.

In 1936 a new concept was introduced into the operation of the formulary system—one which recognized the importance of establishing formal liaison between the hospital pharmacist and the medical staff. This came with the adoption of the first *Minimum Standard for Hospital Pharmacies* by the American College of Surgeons. This document was the work of Dean Edward Spease, who at that time was directing the School of Pharmacy at Western Reserve University, and Robert Porter, who was the chief pharmacist at Western Reserve University Hospitals in Cleveland. Spease and Porter sagaciously recognized that there existed nowhere in the hospital a medium through which the chief pharmacist could communicate formally with the medical staff. True, the chief pharmacist was a department head; true, he could discuss problems at medical staff meetings and resolve questions with individual physicians. But there was no organized group within the hospital which contained representatives of both medicine and pharmacy and which assigned to the pharmacist specific responsibilities and privileges. Spease and Porter filled this need by recommending the establishment of a pharmacy committee with the pharmacist as a permanent secretary. This recommendation was adopted by the American College of Surgeons and has been carried forward and strengthened in the revised *Minimum Standard for Pharmacies in Hospitals* of which the section devoted to the pharmacy and therapeutics committee forms an integral part. More recently, the Joint Commission on Accreditation of Hospitals has encouraged establishment of a pharmacy and therapeutics committee and the preparation or use of a formulary or drug list.

During recent years there has been an increased need, however, to spell out more completely the purposes, organization, functions, and scope of the pharmacy and therapeutics committee, and to establish and implement more detailed and clear-cut principles for the operation of the formulary system. This need has arisen partly due to the greatly increased volume of drugs dispensed in hospitals, partly because of the large increase in the number of drugs and their combinations available, and partly due to certain marketing practices of the pharmaceutical industry. To meet this need, the Joint Committee of the American Hospital Association and the American Society of Hospital Pharmacists has drafted a "Statement on the Pharmacy and Therapeutics Committee," a "Statement of Guiding Principles on the Operation of the Hospital Formulary System," and a "Statement of Principles Involved in the Use of Investigational Drugs in Hospitals."

1.2 Definition of Pharmacy and Therapeutics Committee

The pharmacy and therapeutics committee is an advisory committee of the medical staff which represents the official, organizational line of communication and liaison between the medical staff and the pharmacy department. Its purpose, stated broadly, is to consider all matters related to the handling or use of drugs in hospitals. It is composed of the chief pharmacist and physicians selected under the guidance of the medical staff. This committee is one aspect of medical staff self-government. It is responsible to the medical staff as a whole and its recommendations are subject to medical staff approval.

The chief pharmacist is a voting member of the pharmacy and therapeutics committee and usually serves as its secretary. Three to 10 or more physicians, one of whom serves as chairman, make up the balance of the committee. The hospital administrator or his designated representative is an *ex officio* member. Sometimes the director of nursing is included. Other individuals with specialized knowledge or experience may be invited to attend meetings when their assistance is needed. Meetings are held at least twice a year, usually more often. Recommendations of the committee are presented to the medical staff or to its appropriate executive body for adoption or recommendation. Later they are subject to administrative approval.

1.3 Definition of Formulary System

The formulary system is a method whereby the medical staff of a hospital, working through a pharmacy and therapeutics committee which it appoints, evaluates, appraises, and selects from among the numerous medicinal agents available those that are considered most useful in patient care, together with the pharmaceutical preparations in which they may be administered most effectively.

Drugs selected in this manner, then, comprise the hospital's formulary. Thus, the hospital formulary is a compilation of pharmaceuticals which reflects the clinical judgment of the medical staff. Continuous revision is necessary to maintain an up-to-date formulary.

1.4 Principle of Prior Consent in Dispensing

In many hospitals, the members of the medical staff authorize the pharmacist to dispense drugs under their nonproprietary names, regardless of the names used by the physicians to prescribe the drugs. This is prior consent inasmuch as the consent is given prior to the writing of the prescription. Authorization usually arises as the result of a written recommendation from the pharmacy and therapeutics committee to the medical staff of the hospital. The medical staff has the authority to alter, amend, veto, or approve the recommendation. If the recommendation is approved, it then becomes a written policy of the hospital. If it is vetoed and the pharmacist dispenses a brand different from that prescribed without the physician's consent, he is guilty of substitution.

As applied to hospital practice, the consent of the physician is usually prior consent, although in some hospitals consent is obtained in each instance. No pharmacist in any branch of the profession would dispute the statement that every pharmacist has an inalienable right, when one brand of a drug is prescribed, to ask the physician for his authorization to dispense another brand of equal or better quality which he has in stock.

Community practitioners and some others, however, think of the physician's consent as an authorization obtained after an individual prescription is received by the pharmacist. This thinking is based upon the differences in the relationship between physicians and pharmacists in community practice in contrast to the relationship existing in hospital practice. Community pharmacists do maintain a professional relationship with physicians but it lacks the formal, organizational aspects which exist between physicians and pharmacists in hospitals where the pharmacist is a member of the pharmacy and therapeutics committee. This is a committee of the medical staff which represents the official, organizational line of communication and liaison between the medical staff and the pharmacy department. It assists in the formulation of broad professional policies regarding essentially all matters relating to drugs in hospitals. Thus, it is easy to understand why hospital pharmacists view the matter of physicians' consent from a different vantage point. It is natural that they should; they are in an entirely different position than their colleagues in community practice. Certainly all would agree that a pharmacist who can communicate with a few to several hundred physicians as a single group is in a different position than one who must communicate individually with each physician. Or one may express the advantage in a different manner by stating that a group of physicians may more easily communicate with one pharmacist in a hospital, where all are in daily contact, than it can communicate with a number of pharmacists scattered throughout the community.

Hospital pharmacists have, in fact, no difficulty accepting the definition of substitution published by the National Pharmaceutical Council. This definition reads: "Substitution is the dispensing of a different drug or brand of drug in place of the drug or brand of drug ordered or prescribed without the express permission of the prescribing physician."* Hospital pharmacists maintain they have obtained the "express permission of the prescribing physician" within the meaning of this definition and are in no way engaged in a practice of substitution.

* Anon.: *Drug Trade News* 30:45 (Nov. 21) 1955.

Hospital pharmacists believe that the physician's consent is obtained in a most reasonable manner. Authorization must first be recommended by a committee of the medical staff, it must then be approved by the medical staff itself, and it must finally be approved by the director of the hospital. In addition, members of the medical staff are in a position to provide exceptions to any rule adopted and in this way preserve the professional prerogative of those physicians who may believe that in certain instances it is desirable for a patient to have a specific brand of a drug.

The principle of prior consent has, however, recently been questioned by the American Medical Association, and the "Statement of Guiding Principles on the Operation of the Hospital Formulary System" is now being reviewed by representatives of the American Hospital Association, the American Medical Association, the American Pharmaceutical Association, and the American Society of Hospital Pharmacists.

The four organizations have agreed to the following principles upon which the "Statement of Guiding Principles on the Operation of the Hospital Formulary System" will be revised:

To promote the adoption of a formulary system by the hospital medical staff with the understanding that the administration of such a program will:

1. Be initiated and operated within the individual hospital through regulations promulgated by its medical staff;
2. Insure the maintenance of the responsibility and prerogatives of the physician in the exercise of his professional judgment;
3. Provide for final determination by physicians and pharmacists of medications to be included in the formulary;
4. Authorize the physician to prescribe medications not included in the formulary if in his judgment individual patients require special treatment; and
5. Permit the physician, at the time of prescribing medications, to approve or disapprove the dispensing or the administration of medications in accordance with the hospital formulary system.

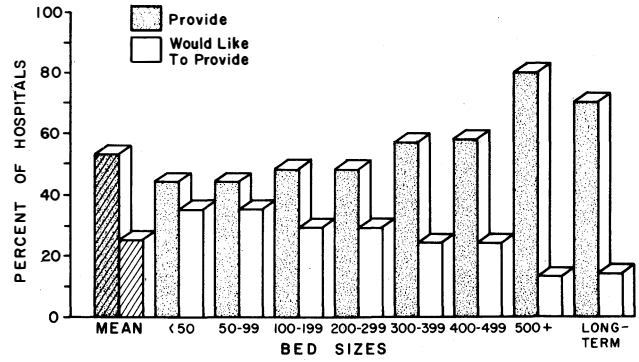
2

STATUS OF PHARMACY AND THERAPEUTICS COMMITTEE

2.1 Hospitals with Committees According to Bed Size

Slightly over 50 percent of the nation's hospitals operate under a formulary system (Figure 55). An additional 25 percent of chief pharmacists would like to operate under such a system. Thus, 3 out of 4 hospitals either now employ the formulary system, or would like to employ it.

FIGURE 55. Hospitals Operating Under the Formulary System



About 3 out of 4 hospitals with pharmacists have a pharmacy and therapeutics committee (Table 85, Q 30a). The percentage of hospitals with a committee increases as the size of the hospital increases. Thus, while only about 4 out of 10 hospitals with under 50 beds have such committees, they are found in more than 9 out of 10 hospitals with 500 or more beds. Sixty-five percent of long-term hospitals have committees; this is below the national average.

One may say, in general, that as the hospital increases in size, so does the number of physicians on the medical staff and the greater is the need to establish and maintain more formal organizational liaison between the pharmacy and the members of the medical staff. On the other hand, small hospitals have a smaller medical staff and it is far easier for the pharmacist to obtain advice and recommendations on problems relating to the professional policies and activities of the pharmacy. Nevertheless, the continuous introduction of a large number of complex drugs and combinations under a multitude of names makes important the formal establishment of a committee representative of the medical staff to deal with this and related problems.

2.2 Active and Inactive Committees

Although 3 out of 4 hospitals with pharmacists have a pharmacy and therapeutics committee, many of these do not meet as often as once a year and thus may be considered inactive. Table 86 shows that about 1 out of 4 committees is, by this definition, inactive. In general, the less active committees are found in hospitals with less than 50 beds.

An inactive committee is not necessarily totally without value but certainly it is not performing the functions which are expected of a group responsible for providing guidance on matters related to drugs (see Table 87). An inactive committee may have some value if it has gone through a period of constructive effort during which policies have been formulated and have received approval of the medical staff and if basic operational principles have been formulated and put into practice. Undoubtedly,

TABLE 85. Percentage of Hospitals with Pharmacy and Therapeutics Committees

Bed Capacity	Number of Hospitals Reporting	Percent with a Pharmacy and Therapeutics Committee	
		Yes	No
Short-term			
Under 50	48	44	56
50–99	156	69	31
100–199	546	72	28
200–299	363	84	16
300–399	198	87	13
400–499	95	86	14
500 and over	144	93	7
Long-term			
All sizes	303	65	35
Average	100	76	24

1853 Hospitals reporting.

TABLE 86. Status of Pharmacy and Therapeutics Committee, Whether "Active" or "Inactive"

Bed Capacity	Number of Hospitals Reporting a Pharmacy and Therapeutics Committee[3]	Status of Pharmacy and Therapeutics Committees in Hospitals Reporting	
		Percent Active[1]	Percent Inactive[2]
Short-term			
Under 50	21	57	43
50–99	108	73	27
100–199	395	69	31
200–299	304	71	29
300–399	172	82	18
400–499	82	79	21
500 and over	134	89	11
Long-term			
All sizes	198	91	9
Average	100	77	23

[1]Meets periodically (one to twelve times) during the year.
[2]Does not meet at all.
[3]1414 Hospitals with a pharmacy and therapeutics committee.

some inactive committees have progressed to this extent and have later delegated the implementation of policies and procedures to the pharmacist. This is an unsatisfactory long-range practice, however, because it tends to destroy the liaison between the pharmacist and the medical staff which the committee was established to provide.

Use of the pharmacy and therapeutics committee as a medium of communication is discussed in Chapter VII. There we note that 62 percent of chief pharmacists select the committee as their first, second, or third choice as a means to communicate with the medical staff. This relates fairly well to the findings in Table 86, which show that 77 percent of the committees are active, when we consider that the term "active" has been rather loosely defined as a committee which meets at least once a year.

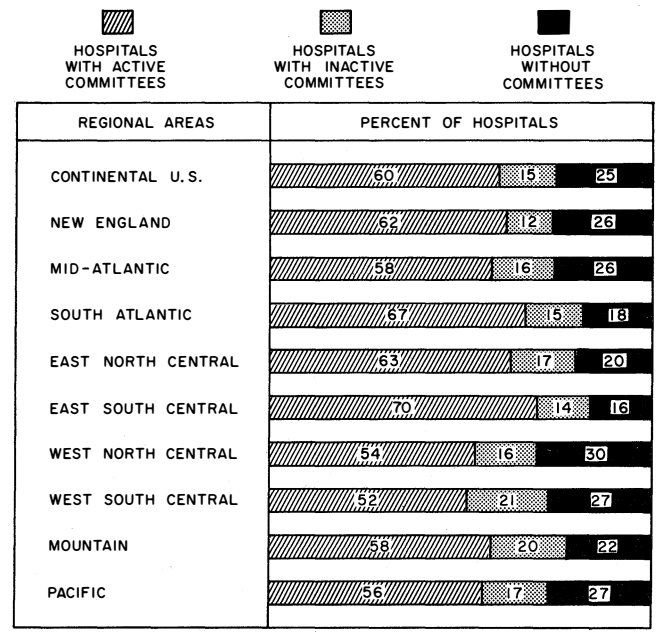
2.3 Regional Distribution of Committees

In four regional areas (South Atlantic, East North Central, East South Central, and Mountain) the percentage of hospitals with pharmacy and therapeutics committees (active or inactive) ranges from 78 to 84 percent, which is above the national average. The number of committees in the remaining five regions falls below the national average (Figure 56). See Figure 1, Chapter IV for listing of states by region.

In four regions, between 60 and 70 percent of hospitals with pharmacists have active pharmacy and therapeutics committees; an additional 12 to 17 percent have inactive committees (Figure 56). In five regional areas the percentage of committees ranges from 52 to 58 percent, which is below the national average of 60 percent; in this group an additional 16 to 21 percent have inactive committees. The two regions with the highest percentage of active committees are the East South Central and the South Atlantic. The West South Central and the West North Central regions have the lowest percentage of active committees; these regions also have a high percentage of hospitals without a pharmacy and therapeutics committee.

If we calculate the ratio of active to inactive committees by region, however, we find that New England and the East South Central regions have the highest ratios of active to inactive committees, 5:1 or more. This indicates that, while the percentage of committees in a given region may be high, the ratio of active to inactive committees may be relatively low. For example, 67 percent of the committees in the South Atlantic region are active while only 62 percent are active in New England. Still, the ratio of active to inactive committees in the two regions are 4.5:1

FIGURE 56. Distribution of Pharmacy and Therapeutics Committees in Hospitals According to Regional Areas



for the South Atlantic region and 5.1:1 for New England. These ratios are dependent upon such factors as bed size of the hospitals in the various regions, the types of hospitals involved, short-term or long-term, teaching, open or closed staff, etc.

2.4 Status According to Ownership

There are more pharmacy and therapeutics committees, by ratio, in federal hospitals (93 percent) than in those controlled by city, county, or state governments (61 percent) or in non-governmental hospitals (77 percent) as shown in Figure 57. All committees in federal hospitals are active, that is, hold one or more meetings a year. The high percentage of committees in federal hospitals may be accounted for by the existence of administrative policies requiring their establishment. The absence of inactive committees may be due not only to the influence of administrative policies but also to the assignment of specific functions which must be handled on a continuing basis such as reviewing requests for new drugs, reporting adverse drug reactions, deleting outmoded drugs, and so forth.

Among the non-federal governmental hospitals, the city and city-county have the highest percentage of active committees. The relatively low percentage of committees in state hospitals is due to the large number of long-term, special hospitals in this group.

About 8 out of 10 community, church, and private non-profit hospitals in the non-governmental group, have pharmacy and therapeutics committees. About 2 out of 10 of these are inactive.

The ratio of active to inactive committees is roughly the same in non-federal governmental and in non-governmental hospitals. The lowest ratio, approximately 2:1, is found in city-county and county hospitals; the highest ratio is in city and state hospitals, about 4:1 and 6:1, respectively.

Perhaps the greatest significance of these findings is the influence the administrative decision taken by federal hospitals to establish committees and to assign functions to them has had both on the number and the activity of these committees. In these cases, an administrative decision resulted in the establishment of committees in entire groups of hospitals. This type of administrative relationship does not exist to any large extent in the non-governmental and the non-federal hospitals and, as a result, the decision to establish a committee is dependent upon the initiative of individuals or groups in many hospitals, each acting independently.

2.5 Number of Meetings per Year

About 50 percent of active pharmacy and therapeutics committees meet 1 to 4 times a year while 28 percent

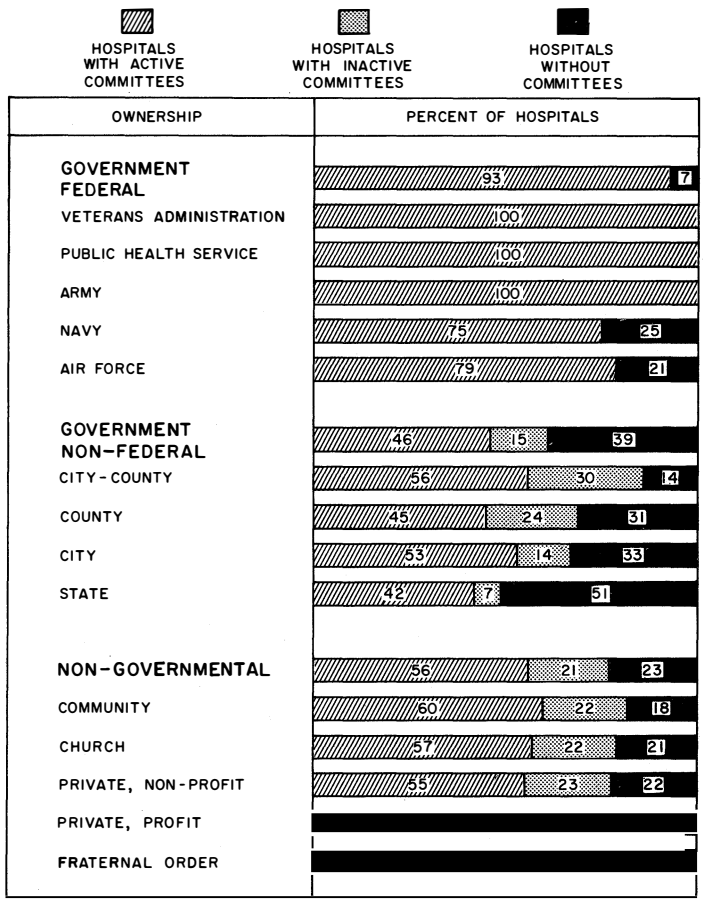


FIGURE 57. Distribution of Pharmacy and Therapeutics Committees in Hospitals According to Ownership

TABLE 87. Extent to Which Typical Activities Are Performed by Pharmacy and Therapeutics Committees in Hospitals with Pharmacists

Activities	Percent of "Active" Committees Which Now Perform or Would Like to Perform Functions			Percent of "Inactive" Committees Which Now Perform or Would Like to Perform Functions			Percent of All Committees Which Now Perform or Would Like to Perform Functions		
	Now Perform	Would Like to Perform	No Answer	Now Perform	Would Like to Perform	No Answer	Now Perform	Would Like to Perform	No Answer
Delegate to chief pharmacists responsibility for preparing specifications and selecting acceptable sources of supply	74	11	15	39	31	30	66	16	18
Recommend list of emergency and other drugs to be stocked on nursing units	60	20	20	34	33	33	54	23	23
Approve drugs by official or nonproprietary names rather than by brand names	58	26	16	25	46	29	50	31	19
Indicate which drugs are to be stocked in the pharmacy	56	18	26	24	33	43	48	22	30
Recommend deletion of outmoded drugs	49	33	18	14	45	41	40	36	24
Assist in actual preparation and revision of formulary	48	29	23	14	43	43	39	32	29
Recommend procedures for writing medication orders by physicians and interns	40	39	21	17	45	38	34	41	25
Help pharmacist evaluate claims by pharmaceutical manufacturers for superiority of certain competitive products	39	31	30	14	42	44	33	34	33
Recommend policies governing investigational drugs	31	38	31	12	41	47	26	39	35
Assist chief pharmacist in preparing drug information bulletins for medical and nursing staffs	17	42	41	8	37	55	15	41	44
Number of hospitals responding in each category		(1085)			(329)			(1414)	

meet 11 or more times annually. The general pattern for most committees is to meet either 1 to 4 or 11 or more times per year (Table 88). In general, committees tend to meet more frequently in the larger, short-term hospitals. Outstandingly, almost 60 percent of active committees in long-term hospitals meet 11 or more times annually.

The number of meetings held is one index of the activity of pharmacy and therapeutics committees. About half of them meet 4 or less times while about half meet 5 or more times a year. It is noteworthy that of those which do meet more than 5 times annually, more than half meet as often as 11 or more times.

RECOMMENDATIONS

*8.1 **Formation of Pharmacy and Therapeutics Committees.*** It is recommended that hospitals lacking a pharmacy and therapeutics committee of the medical staff establish such a committee and that hospital pharmacists take the initiative, through proper administrative channels, in encouraging its formation.

*8.2 **Activation of Established Committees.*** It is recommended (1) that all pharmacy and therapeutics committees establish a policy of meeting several times a year and (2) that chief pharmacists make continuing efforts to stimulate this activity by bringing to the attention of existing committees matters which should be given consideration and by helping to develop current and long-range programs for the committee.

*8.3 **Minutes of Meetings.*** It is recommended that minutes of the activities of the pharmacy and therapeutics committee be maintained and be available to all interested medical staff personnel.

3

FUNCTIONS PERFORMED

3.1 Scope of Activities

In this study an attempt was made to determine the extent to which pharmacy and therapeutics committees carry out certain typical activities as listed in Table 87 (Q 31). These activities are concerned with the formulation of policies for consideration by the medical staff, implementation of the policies approved, and the exercise of advisory functions.

Results of the survey show considerable variation in the scope of activities performed.

The large number of "no answers" to this section of the survey is also significant. This may be due to one or a combination of reasons. For example, the activity listed in the questionnaire may not have been applicable to the hospital. For instance, policies governing investigational drugs might not apply, in particular, to a small hospital in which the physicians do not do research. Again, the pharmacist may not

have answered a question which related to an activity in which he or the committee did not care to become involved. For instance, he may believe that the preparation of a drug information bulletin would require more time and facilities than he or the committee has available. It will be noted that there is proportionately a greater number of "no answers" from inactive committees. This may be due, in part, to lack of familiarity on the part of the respondent with the generally accepted functions of a pharmacy and therapeutics committee and also to the inactivity *per se* of the committee. A fairly large percentage of respondents from inactive committees, however, indicated a desire that the committees perform the functions listed.

3.2 Specifications and Sources of Supply

Over 7 out of 10 active pharmacy and therapeutics committees have delegated to the chief pharmacist responsibility for preparing specifications for drugs and for selecting acceptable sources of supply. In contrast, only about 4 out of 10 inactive committees have delegated this responsibility. An additional 11 and 31 percent of pharmacists, representing active and inactive committees respectively, would like to have their committees delegate this responsibility. No answer to this part of the question was received from 30 percent of pharmacists with inactive committees.

Delegation of this responsibility is in conformity with accepted practice. Since the pharmacist has the responsibility for compounding, prepackaging, dispensing, and manufacturing drugs used in the hospital, he should also have authority to specify the quality and source of drugs to be purchased. This is true even in those institutions where the actual procurement is done by a purchasing agent through a centralized office. Inherent in this responsibility is the authority to reject any article found below standard, or not meeting specifications. The fact that responsibility for specifications and sources of supply has been delegated to the pharmacist by almost twice as many active committees, in contrast to inactive committees, is strong argument for regular meetings of the committee.

3.3 Approval of Drugs by Nonproprietary Names

About 6 out of 10 active committees approve drugs by their nonproprietary or generic names; in contrast, this is done by less than 3 out of 10 inactive committees. When we combine the percentages of committees which now perform this function with those which would like to perform it, we find that 84 percent of the active and 71 percent of the inactive committees either now perform this function or would like to. Almost twice as many respondents from inactive committees gave no answer to this question.

The policy of approving drugs under their nonproprietary names has common acceptance among scientific groups. The *Pharmacopeia of the United States* and the *National Formulary* follow this practice, as does *New and Nonofficial Drugs*, although in the latter trade names are included as synonyms as an aid to prescribing and identifying drugs.

Once the pharmacy and therapeutics committee delegates to the chief pharmacist the responsibility for preparing specifications and selecting acceptable sources of supply, the committee has placed upon him in a formal manner the professional and moral obligation to the patient, to the medical staff, and to his profession to specify and select sources of quality drugs. He is somewhat blocked in his degree of freedom, however, in selecting acceptable sources when the committee does not also approve drugs under their nonproprietary names and if the committee does not also help to evaluate manufacturers' claims for superiority of their products, etc.

Both nonproprietary and trade names for drugs have a definite place in the hospital. To those who advocate the use of nonproprietary names exclusively, and there are many, one must bow to reality and

TABLE 88. Number of Meetings per Year Held by "Active" Pharmacy and Therapeutics Committees

Bed Capacity	Number of Hospitals with "Active" Committee[3]	Percent of Hospitals Reporting the Following Number of Meetings Per Year[1]				
		1–2	3–4	5–6	7–10	11 and Over[2]
Short-term						
Under 50	12	25	50	—	25	—
50–99	81	41	19	15	3	22
100–199	271	31	35	11	6	17
200–299	216	30	34	11	6	19
300–399	141	26	35	11	9	19
400–499	65	14	34	14	9	29
500 and over	119	9	32	15	8	36
Long-term						
All sizes	180	2	17	15	7	59
Average	100	22	30	13	7	28

[1]Percent of hospitals with active pharmacy and therapeutics committee reporting.
[2]About 2 percent out of 1085 active pharmacy and therapeutics committees meet more than 12 times per year.
[3]1085 Hospitals with "active" pharmacy and therapeutics committees.

recognize that too few pharmacists, physicians, and nurses are sufficiently acquainted with nonproprietary nomenclature to make this general policy workable. This is particularly true of those drugs patented and manufactured by only one pharmaceutical company and distributed under one trade name.

This picture changes, however, when a drug is distributed by several firms under different trade names. In this group of drugs, the use of nonproprietary names is important and feasible, especially as far as the policies of the pharmacy and therapeutics committee are concerned. By accepting a policy such as "Drugs will be admitted into the hospital formulary under their public or nonproprietary names," the pharmacy and therapeutics committee provides a mechanism to avoid the stocking of numerous brands of the same basic drug in the hospital.

Many persons have misinterpreted this rule to indicate that hospitals do not carry or dispense trade name drugs. This is not true. They merely do not accept them into their official formulary solely under their trade name. The acceptance of a drug is under its nonproprietary name, and this official name may be followed by one or more trade names.

In most hospitals that operate under the formulary system, the policy is to adopt the basic drug and to authorize the pharmacist to dispense a reliable brand of the drug. The effect of this policy is to eliminate duplication of numerous brands of the same basic drug and to produce an appreciable reduction in drug inventories.

The operation of this policy is not as simple as it may appear. Its success depends upon close cooperation between the pharmacist and the medical staff. The staff must have confidence in the judgment of the pharmacist to select drugs manufactured by pharmaceutical firms that specialize in quality products. Nothing will so quickly foster rebellion among the medical staff as attempts to supply pharmaceutical products obtained from nondescript sources at a low price, and quite properly so. It is often a misguided administrator or overzealous purchasing agent who unwittingly disrupts the smooth working arrangement and understanding between the medical staff and the pharmacist by directing purchases to sources which are acceptable to neither. As mentioned in Chapter V, however, hospital pharmacists have a great deal of freedom in the operation of their departments and maintain good relationships with administration.

3.4 Drug Evaluation and Inventory

Pharmacy and therapeutics committees reported performance of several policy-making activities related to drug evaluation. Included are such activities as helping the pharmacist evaluate claims made by pharmaceutical manufacturers of competitive drugs, indicating drugs to be carried in the pharmacy's inventory, and recommending deletion of outmoded drugs (Table 87).

Only about 4 out of 10 pharmacy and therapeutics committees help the chief pharmacist evaluate claims made by pharmaceutical manufacturers for superiority of certain competitive products. We do not know from the findings the extent to which this function is carried out; that is, whether this is a regular procedure employed with every competitive drug or whether it is done only in exceptional cases. We believe, however, the latter is the general practice. In the vast majority of cases, competitive items such as cortisone, penicillin, tetracycline, or meprobamate marketed by firms with a reputation for quality products are accepted as equivalents. Some cases may arise where a claim is made that absorption is enhanced because of the use of a buffer, a different vehicle, the composition of an enteric coating, etc., and in these circumstances the committee may make its evaluation of such claims. Most pharmacists would like their committees to be more active in this area—7 out of 10 from active committees and 5 out of 10 from inactive committees so indicating.

The selection of drugs to be stocked in the pharmacy flows automatically from one of the basic functions of the committee, namely, to evaluate drugs. Here again we note the contrast between active and inactive committees and find that 56 percent of the former and only 24 percent of the latter perform this function.

Closely related to this function is another, recommending deletion of outmoded drugs. For example, it is stated that approximately 5 percent of drugs in the *United States Pharmacopeia* become obsolete yearly. About half of the active committees perform this function while it is done by only 14 percent of inactive committees. A large percentage of respondents in both the active (33 percent) and inactive (45 percent) groups would like their committees to recommend deletion of outmoded drugs.

Undoubtedly, deletion of outmoded drugs is often accomplished in an informal manner simply by letting them fall into disuse. This has the disadvantages of increasing the inventory, of not allowing the drugs to be returned for credit within a reasonable time, and of using storage space for unused items.

3.5 Drugs for Emergency Use

About 6 out of 10 active and about half as many inactive committees recommend a list of emergency and other drugs to be stocked on nursing units (Table 87). It is essential that certain drugs be always available for instant use and it is apparent that a large majority of committees devote attention to their selection.

Availability of selected drugs on nursing units does not mean, of course, that the patient may not be charged for some or all of them. The matter of charging for drugs on nursing units is an administrative decision. The usual practice is to supply certain emergency and other drugs at no charge to the patient. Others, particularly the more expensive, are

charged to the patient even though they may be stocked on the nursing units. Practices in handling ward stock drugs vary greatly. In this matter, the principal function of the pharmacy and therapeutics committee is to ensure that certain life-saving drugs will be available instantly, as for example an emergency tray, without regard for methods of charging or accounting for their use.

3.6 Investigational Drugs

Policies or procedures for the handling of investigational drugs are recommended by about 3 out of 10 active and about 1 out of 10 inactive committees. Roughly, an additional 40 percent of pharmacists want their committee to undertake this responsibility (Table 87).

Here again, a matter of patient safety is involved. This responsibility is an important one which merits more consideration by pharmacy and therapeutics committees. Of course, not shown by this survey is the percentage of hospitals using investigational drugs and it may be that many do not. If such be the case, this deficiency is not as great as might be inferred from the findings.

3.7 Preparation of Formulary and Drug Bulletins

Almost 50 percent of active pharmacy and therapeutics committees, but only 14 percent of inactive ones, assist in the actual preparation and revision of the hospital's formulary. A large percentage of pharmacists from both types of committees want more help in this task (Table 87).

In the preparation of a formulary it is often the practice for the committee to make the policy decision on the drugs or preparations to be used and to delegate to the chief pharmacist responsibility for preparing the monograph or other descriptive material.

When drug information bulletins are prepared, the pharmacist performs this function unaided in more than 8 out of 10 cases regardless of whether the committee is active or inactive.

3.8 Drug Order Writing Procedures

Procedures for order writing by physicians and interns are recommended by only 4 out of 10 active committees and less than 2 out of 10 inactive committees. An additional 40 percent or more of pharmacists would like their committee to carry out this function (Table 87).

This function has an important bearing on patient safety and it is unfortunate that more committees do not interest themselves in it. The purpose of developing such procedures or rules for order writing, including medication orders, is to bring order and system into a hospital procedure with which numerous, sometimes inexperienced, people are concerned. These procedures are formulated to safeguard the patients by establishing practices which tend to avoid misunderstanding, confusion, and mistakes in the administration of medication. They concern themselves with such matters as automatic stop orders, PRN orders, telephone and verbal orders, and means of designating routes of administration, and so forth.

RECOMMENDATIONS

8.4 Scope of Activities. It is recommended that pharmacy and therapeutics committees increase their scope of activities to include essentially all matters related to drugs and that particular attention be given to (1) the promotion of rational drug therapy through the clinical appraisal of drugs, the evaluation of drug literature, the dissemination of drug information, periodic audits of medical records relating diagnosis to drugs prescribed, and by other means, and (2) a consideration of matters affecting patient safety such as the importance of careful order writing to avoid medication errors, the handling of investigational drugs, the preparation of parenteral admixtures by nurses and so forth.

8.5 Role of the Pharmacist. It is recommended that the American Society of Hospital Pharmacists carry out a study of pharmacy and therapeutics committee activities with special reference to (1) the scope of functions which should be performed, (2) the role of the pharmacist on this committee, particularly his role in encouraging rational drug therapy, in the evaluation of pharmaceutical dosage forms, and in promoting safety practices relative to the handling and use of drugs in hospitals, and (3) compile a manual of policies and procedures and other aids which the pharmacist may use as reference to help him better fulfill his role.

4

STATUS OF HOSPITAL FORMULARIES

4.1 Formularies According to Bed Capacity and Types

The distribution and types of formularies according to bed capacity are shown in Table 89. About 6 out of 10 hospitals with pharmacists have either a formulary or drug list which presents information on the medications available. The percentage of hospitals which have adopted a formulary increases, in general, with bed size, from a low of 44 percent in hospitals with from 50–99 beds to a high of 81 percent in hospitals with 500 beds or more. Some hospitals have both a formulary and a drug list; the latter for convenience.

Of the hospitals with formularies, 63 percent have developed their own, 8 percent have adopted another hospital's formulary, while 22 percent use a drug list.

TABLE 89. Distribution and Types of Formularies in Hospitals

Bed Capacity	Number of Hospitals Reporting	Percent of Hospitals with a Formulary or Drug List	Types of Formulary (Percent of Hospitals with a Formulary)			
			Developed Own Formulary	Another Hospital's Formulary	Drug List	Did Not Specify Type
Short-term						
Under 50	48	50	50	—	50	—
50–99	156	44	43	9	48	—
100–199	546	52	58	8	26	8
200–299	363	52	62	15	18	5
300–399	198	64	71	10	14	5
400–499	95	60	75	4	17	4
500 and over	144	81	83	4	9	4
Long-term						
All sizes	303	75	59	5	24	12
Average	100	59	63	8	22	7

1853 Hospitals reporting.

In general, the percentage of short-term hospitals developing their own formularies tends to be greater as the size of the hospital increases, with over 8 out of 10 hospitals with 500 beds or more developing their own formulary. Relatively few hospitals have adopted another hospital's formulary. The largest percentage of those which have are in the size range of 200–399 beds.

Almost 1 out of 4 hospitals utilizes a drug list. The percentage of short-term hospitals using a drug list tends to vary inversely with the bed size of the hospital. Among the short-term hospitals under 100 beds, about half of them have a formulary and half use a drug list.

This study was made prior to the availability of the *American Hospital Formulary Service* in 1958. Since about 20,000 copies of this service had been sold by the end of 1962, it is certain that many hospitals have adopted this service as the basis for their formulary. In fact, in response to question 20b—Do you believe that the *American Hospital Formulary* now being compiled by the American Society of Hospital Pharmacists as a part of a formulary service would be helpful to you in your hospital?—79 percent replied yes; 13 percent replied no; while 8 percent gave no reply.

One could anticipate the existence of a higher percentage of formularies in hospitals with 500 or more beds. Drug therapy is, of course, taught in medical schools and these are closely associated with teaching hospitals in which a significant amount of clinical research is done in evaluating drugs. It is quite natural, therefore, that the results of such research should be incorporated in the teaching program for interns and students, that new and better agents should be pointed out as they are developed, that they should be compared and contrasted with existing remedies, and that the student should be taught to selectively evaluate the therapeutic agents he employs. It is also quite natural that the results of this research and teaching be formalized, and that the evaluated and selected agents be compiled in the

TABLE 90. Status of Formularies and Drug Lists in Hospitals According to Ownership

Ownership	Number of Hospitals Reporting	Percent of Hospitals with a Formulary or Drug List	Types of Formulary (Percent of Hospitals with a Formulary)			
			Developed Own Formulary	Another Hospital's Formulary	Drug List	Did Not Specify Type
Governmental, non-federal	391	61	66	6	24	4
State	182	70	68	3	26	3
County	101	62	66	5	24	5
City	64	57	71	7	19	3
City-county	44	55	58	13	29	—
Governmental, federal	294	92	84	5	8	3
Public Health Service	40	100	92	8	—	—
Veterans Administration	162	98	77	9	11	3
Air Force	34	86	95	—	—	5
Navy	20	85	94	—	6	—
Army	38	83	79	4	13	4
Other federal	—	—	—	—	—	—
Non-governmental	1153	53	63	11	19	7
Private, non-profit	462	59	68	8	19	5
Community	162	54	69	10	16	5
Fraternal order	4	50	—	—	50	50
Church	476	48	54	15	20	11
Private, profit	49	40	67	17	16	—

1853 Hospitals reporting.

TABLE 91. Status of Formularies and Drug Lists in Hospitals According to Regional Areas

Regional Area	Number of Hospitals Reporting	Percent of Hospitals with a Formulary or Drug List	Types of Formulary (Percent of Hospitals with a Formulary)			
			Developed Own Formulary	Another Hospital's Formulary	Drug List	Did Not Specify Type
Continental U. S.	1853	59	63	8	22	7
New England	141	76	54	15	16	15
South Atlantic	196	67	67	7	22	4
Mid Atlantic	342	61	72	8	17	3
West North Central	201	56	69	6	17	8
Pacific	203	56	69	9	18	4
East North Central	396	55	53	13	21	13
West South Central	167	53	64	16	15	5
East South Central	102	51	71	5	24	—
Mountain	105	52	63	13	19	5

form of a written formulary. This process of formalizing took place early in the teaching hospitals of the New England states and its effects spread to other hospitals of the region with the result that a large number of them followed the pattern of developing formularies.

4.2 Status According to Ownership

The status of formularies and drug lists in short-term and long-term hospitals according to ownership is shown in Table 90. Governmental hospitals employ a formulary to a greater extent than do non-governmental hospitals. More than 9 out of 10 hospitals operated by the federal government have a formulary or drug list. Relatively few drug lists, in comparison with formularies, are used in federal hospitals; 8 percent use drug lists while 89 percent use formularies. All Public Health Service hospitals have a formulary while about 86 percent of Veterans Administration hospitals have a formulary and 11 percent use a drug list.

Over 60 percent of non-federal governmental hospitals have a formulary or drug list. Of these, 72 percent use a formulary while 24 percent use a drug list. A higher percentage of state and county hospitals use a formulary or drug list than do city or city-county hospitals. In the state and county hospitals the ratio of formularies to drug lists used is about 4:1.

Slightly more than 50 percent of non-governmental hospitals have a formulary or drug list. Of these, 74 percent use a formulary while 19 percent employ a drug list. Among the non-governmental hospitals, community and private non-profit hospitals closely parallel the city and city-county hospitals in the percentage which have a formulary or drug list.

In general, one may infer that the large percentage of formularies in hospitals of the federal government is due to the establishment of long-range policies and practices which have been formalized and coordinated so that the development and use of a formulary are a part of an operational policy. In contrast, non-federal hospitals and non-governmental hospitals tend to act independently of each other with the result that more variation exists in their operational policies.

4.3 Variation According to Region

Regional areas of the country show variation in the percentage of hospitals with a formulary or drug list (Table 91). In the continental United States 59 percent of hospitals have either a formulary or a drug list. Of these, 71 percent have a formulary while 22 percent have a drug list and 7 percent did not specify. More than 3 out of 4 hospitals in New England have a formulary or drug list while in several regions this is true of only somewhat more than half of the hospitals. In all regions, the formulary is preferred over the drug list in the ratio of about 4:1.

4.4 Relationship Between Formulary and Committee

The relationship between the existence of a pharmacy and therapeutics committee and the presence or absence of a formulary or drug list is shown in Table 92. Again, we note the contrast between active and inactive committees.

While 30 percent of hospitals with an active committee do not have a formulary or drug list, this percentage rises to 52 for hospitals with inactive committees. Almost 70 percent of hospitals without a committee have neither a formulary nor a drug list. Thus, hospitals with an active committee are more likely to have a formulary or drug list than are hospitals with an inactive committee or those lacking a committee.

This survey was made when no national hospital formulary service was available. Thus, one good measure of the activity of a committee at that time is the development of an individual formulary for use in the hospital since a formulary is many steps beyond a drug list and involves more effort to develop. As shown by Table 92, more than 5 out of 10 active committees developed their own formulary in contrast to a little more than 2 out of 10 among the group of inactive committees. Almost 2 out of 10 hospitals without a pharmacy and therapeutics committee, however, have also developed a formulary. In general, we may say that inactive committees have a greater tendency

TABLE 92. Status of Pharmacy and Therapeutics Committees and Formularies or Drug Lists in Hospitals

Status of Pharmacy and Therapeutics Committee	Number of Hospitals Reporting	Percent of Hospitals Reporting Formulary or Drug List				Percent of Hospitals with No Formulary or Drug List
		Developed Own Formulary	Another Hospital's Formulary	Drug List	Did Not Specify Type	
Have committee						
Active	1085	51	6	11	2	30
Inactive	329	22	6	11	9	52
All P & TC	1414	44	6	11	4	35
No committee	398	19	2	7	3	69
Average	100	39	5	11	4	41

1853 Hospitals reporting.
41 Hospitals did not respond.

than active committees to use a drug list or another hospital's formulary. This tendency toward a passive role is further corroborated by the findings in Table 87 where we note that few inactive committees take responsibility in helping the pharmacist evaluate claims by pharmaceutical manufacturers, aid in the preparation of a formulary, or commit themselves to advise or act in other areas.

About 23 percent of hospitals with pharmacists do not have a pharmacy and therapeutics committee (Table 85). Still 31 percent of these, according to Table 92, have either a formulary or a drug list. Here we note that 21 percent have developed their own formulary or used that of another hospital, while 7 percent use a drug list. From these findings we may infer that in hospitals without a pharmacy and therapeutics committee the pharmacist assumes essentially total responsibility in issuing a formulary or drug list. We do not know the extent to which he consults with the medical staff. The formulary or drug list may represent a compilation of drugs actually prescribed, with no attempt at evaluation. Or it is possible that in some instances arbitrary limitations may be placed on drugs which can be prescribed. Neither practice is desirable. The formulary or drug list should be prepared under the aegis of the medical staff represented by the pharmacy and therapeutics committee. Furthermore, the lack of such a committee impedes severely consideration of numerous other questions and problems which arise constantly on matters related to drugs outside the area of the formulary system.

These findings show that the existence of a pharmacy and therapeutics committee does not automatically lead to the development or use of a formulary or drug list in a hospital; in fact, 35 percent of hospitals have neither a formulary nor a drug list. Nor does the absence of a committee necessarily mean the hospital does not have a formulary or drug list; in fact, 31 percent of them do have one or the other. Although a hospital may have a pharmacy and therapeutics committee, it may not operate under the formulary system. In this case the committee may serve principally as a means of formal communication and liaison between the medical staff and the pharmacy. On the other hand, the pharmacist in a hospital without a pharmacy and therapeutics committee may compile a formulary or drug list to serve as a guide to the drugs and preparations carried in the pharmacy.

If we consider all hospitals that have a formulary or drug list, however, we find that there is a pharmacy and therapeutics committee in 92 percent of them. This indicates that the presence of a committee strongly supports the development of a formulary or drug list.

A properly operated formulary system is made possible through the cooperation of the pharmacy and the medical staff operating through an organized, active pharmacy and therapeutics committee. The findings of this survey show that, almost invariably, when a hospital has a formulary or drug list it also has a pharmacy and therapeutics committee. In addition, the results emphasize a great contrast in the range and depth of functions carried out by active committees in contrast to inactive committees.

RECOMMENDATIONS

8.6 ***Responsibility for Formularies.*** It is recommended that hospital formularies or drug lists be prepared or adopted only under the auspices of the medical staff working through the pharmacy and therapeutics committee and should not be established solely as a principal responsibility of pharmacy or administration.

8.7 ***Formulary Service.*** It is recommended that pharmacy and therapeutics committees of medical staffs be encouraged to use the *American Hospital Formulary Service* as a time-saving tool in compiling individual hospital formularies.

5

DISPENSING UNDER THE FORMULARY SYSTEM

5.1 Authority for Use of Nonproprietary Names

Various methods are used by medical staffs of hospitals to authorize pharmacists to dispense drugs under their nonproprietary or generic names when trade names are used in prescribing. These methods vary somewhat with the size and type of hospitals (Table 93, Q 19).

TABLE 93. Authority of Pharmacists to Dispense Drugs Under Nonproprietary Names When Brand Names Are Used in Prescribing

How Authority Is Granted	Percent of Hospitals Reporting				
	Short-Term Hospitals			Long-Term Hospitals (All Bed Sizes)	All Short- and Long-Term Hospitals
	Under 100 Beds	100 Beds and Over	All Short-Term Hospitals		
Verbal agreement	33	32	33	40	33
Written policy by the hospital	15	27	26	29	26
Permission granted in each individual case	26	22	23	21	22
Physician signs agreement, giving individual permission	3	3	3	3	3
Other methods	12	11	11	17	12
Permission granted; no answer how	3	<1	<1	—	<1
No permission given	24	20	21	4	18
Total number of hospitals reporting in each group	(204)	(1346)	(1550)	(303)	(1853)

Authority is granted by verbal agreement in about a third of all short-term hospitals and in 40 percent of long-term hospitals. This is not a desirable method from an organizational point of view and, particularly, from the legal viewpoint. Use of this method may place the pharmacist in an awkward and legally untenable position if consent should be denied at a later date.

In over 50 percent of hospitals authority is granted by methods accepted as legally sound. These include written policy by the hospital, permission granted in each individual case, and signature of physician granting such authority. An additional 12 percent of hospitals use other methods which presumably vary in detail from those described and upon which we do not have enough information to comment.

Written policy to dispense drugs under their nonproprietary names is used by about 1 hospital in 4. This method is employed to a far greater extent in long-term hospitals, in contrast to short-term hospitals under 100 beds. This is undoubtedly due to the large number of federal hospitals in this group which have established written policies in each of their hospitals.

Permission is granted in each individual case in, roughly, 1 hospital in 5. This method is used slightly more often in short-term hospitals with less than 100 beds. In only about 3 percent of hospitals do physicians sign an agreement authorizing the pharmacist to dispense drugs under their nonproprietary names.

In 18 percent of hospitals reporting, pharmacists are not authorized to dispense drugs under their nonproprietary names when trade name drugs are prescribed. We interpret this to mean that no formal or informal prior consent is given the pharmacist. This interpretation is supported by the fact that the percentages in each column in Table 93 total more than 100 percent. This also implies that authority may in some cases be granted by more than one method. Furthermore, the pharmacist always has the prerogative of consulting the physician to obtain his individual consent.

We note that in long-term hospitals only 4 percent do not have authority to dispense drugs under their nonproprietary names. As noted in Table 3, about 83 percent of long-term hospitals are operated by a governmental agency, state or federal. In addition, these hospitals have a high percentage of active pharmacy and therapeutics committees (Figure 57), which perform many functions (Table 87). Also, a greater percentage of these hospitals have a formulary or drug list (Table 90). The discussion of Table 92 pointing out the correlation between the pharmacy and therapeutics committee and the formulary also bears upon this finding.

Authorization for dispensing drugs under their nonproprietary names should be obtained in writing in a manner prescribed by the pharmacy and therapeutics committee and approved by the medical staff and by the hospital's attorneys. In each case, however, some provision should always be made to assure the physician the prerogative of obtaining a trade name product when he believes it is important for his patient. This usually calls for the physician to go a step beyond writing the proprietary name. He may be asked to underline or encircle the name or take some other further step as decided by the medical staff.

In interpreting the results of the findings in Table 93, however, we must conclude that there is an apparent hesitancy on the part of the medical staff to give authority in a formal manner to hospital pharmacists to dispense drugs under their nonproprietary names when brand name drugs are prescribed. Still, the fact that in a third of all hospitals this permission is given by verbal agreement implies that many physicians do not object to such a policy. These, and other, responses strongly imply that many physicians, and pharmacists as well, do not understand the concept of accepting drugs under their nonproprietary names and are somewhat at a loss as to the methods which may be used to assure procurement of quality drugs under this policy. In general, we believe this misunderstanding is more prevalent in open staff than in closed staff hospitals and in non-teaching than in teaching hospitals.

5.2 Product Duplication

The extent of duplication of brands of the same basic drug in hospitals according to formulary status is

TABLE 94. Extent of Duplication of Brands of the Same Basic Drugs in Hospitals According to Formulary Status

Extent of Duplication[1]	Status of Formulary System in Percent	
	Formulary[2]	Non-Formulary
Routinely stock any brand of drug prescribed	21	54
Need for keeping duplicate brands		
a. Very great to quite an extent	19	51
b. Somewhat	18	20
c. Little	33	24
d. None at all	30	5

[1]32 Percent of all hospitals with pharmacist, whether they have a formulary or not, routinely stock any brand of any drug called for.
[2]Includes formulary and drug list.

shown in Table 94 (Q 22, 25). Here we note that 32 percent of all hospitals with pharmacists, whether they have a formulary system or not, routinely stock any brand of drug called for. In other words, about 2 out of 3 hospitals limit, in some manner, the number of brands of the same basic drug. (See footnote to Table 94.)

We note, however, a significant difference in the extent of this practice in hospitals with the formulary system and those without it. Only about 2 out of 10 hospitals with the formulary system routinely stock any brand of drug called for; in contrast, in hospitals without a formulary system this ratio rises to more than 5 out of 10.

Perhaps the operating phase of this question is better shown by the need for actually stocking duplicate brands, also shown in Table 94. We note that most hospitals find it necessary to keep duplicate brands to some extent. No duplicate brands, however, are carried by 30 percent of hospitals under the formulary system, in contrast to 5 percent in hospitals not operating under this system. We also note that the sum of those hospitals with the formulary system which need to keep duplicate brands a *little to none at all* is 63 percent while in hospitals without the formulary system it is 29 percent. The fact that 29 percent of hospitals without a formulary system find it unnecessary to maintain stocks of duplicate brands, except to a very limited extent, emphasizes that some factor other than the formulary system is at work.

About 50 percent of hospitals without the formulary system find it necessary to keep duplicate brands a *very great to quite an extent;* this need exists in only about 20 percent of hospitals operating under the formulary system.

The effect of the formulary system on the number of brands of certain drugs routinely stocked in short-term hospitals is shown in Table 95. We note that from about 50 to 70 percent of hospitals with a formulary system carry only one brand of reserpine, tetracycline, hydrocortisone, and procaine penicillin. In contrast, in hospitals without the formulary system about 20 to less than 50 percent stock only one brand.

If we consider hospitals which carry 3 to 4 or more brands of the drugs mentioned we see that 25 to 70 percent of hospitals without a formulary system and 10 to 40 percent of those with the formulary system find it necessary to carry 3 or more brands.

These findings show that there is a direct relationship between the existence of the formulary system and the extent of product duplication and that the existence of the formulary system tends to decrease duplication of products under different brand names in hospitals.

The findings also show that while the formulary system plays an important role in reducing the number of duplicate brands it is not the sole factor. It is apparent that some other factor is operating here and that a formulary system *per se* is not the only tool for overcoming product duplication. For example, almost half the hospitals without a formulary system stock only 1 brand of procaine penicillin while about 30 percent have only 1 brand (over 70 percent have only 2 brands) of hydrocortisone. Further, we have noted that 29 percent of hospitals without the formulary system carry duplicate brands to only a very limited extent. This may be explained by the fact that some hospitals without a formulary system have a pharmacy and therapeutics committee which may effect this standardization. But this does not account for all hospitals in this group and we can only postulate that standardization is effected by the pharmacist

TABLE 95. Effect of Formulary System on the Number of Certain Drugs Routinely Stocked in Hospitals

Drug	Formulary Status	Percent of Hospitals That Stock the Following Number of Brands				
		1	2	3	4 or More	No Answer
Reserpine	Yes	55	21	13	9	2
	No	22	26	22	28	2
Tetracycline	Yes	52	20	15	12	1
	No	19	20	27	33	1
Hydrocortisone	Yes	61	27	7	3	2
	No	30	41	19	7	3
Procaine penicillin	Yes	71	15	6	5	3
	No	47	22	15	14	2
Therapeutic multivitamin	Yes	42	17	12	25	4
	No	14	13	15	55	3

[1]346 Hospitals reporting.

TABLE 96. Principal Reasons for Brand Duplication in Hospitals with and without a Formulary

Principal Reasons for Brand Duplication	Hospitals with a Formulary	Hospitals without a Formulary
	Percent	
To treat special patient cases	3	1
Brand names requested by physician	42	40
Lack of cooperation with medical staff	8	10
Budgetary limitation	>1	>1
Influence of detailmen	4	6
Good relationship with medical staff	3	2
Authority given by medical staff	2	1
Other miscellaneous reasons	10	6
No formulary system	3	10
Total number of hospitals responding[1]	(543)	(514)

[1]Source of data is taken from 1346 short-term hospitals over 100 beds that stock duplicate brands routinely or to some extent. It includes 230 hospitals with a formulary and 46 hospitals without a formulary that do not stock any duplicate brands, and 23 hospitals that did not respond at all.

acting alone or with the cooperation of the medical staff and/or the administrative officials.

Analysis of the principal reasons given for brand duplication in hospitals with and without a formulary is shown in Table 96 (Q 25a). This table was compiled from responses to the open-end question "What would you say is the main reason for this?" *i.e.*, necessity to keep duplicate brands of the same basic drug. The table excludes the 30 percent of hospitals with a formulary and the 5 percent without a formulary in which no duplicate brands are carried.

In examining this table we note that there is little actual difference in the percentages of the reasons given for brand duplication in each type of hospital—those with and without a formulary. This is true in the first seven reasons listed in the table. We also note that the "no answers" to this question are high, about 25 percent in each type of hospital.

Thus, analysis of this table has to be done in reference to the findings in Table 94. We can say that the reasons for brand duplication, when it occurs, are essentially the same in hospitals with a formulary system and those without it. However, as noted in Table 94, the extent of brand duplication in hospitals with the formulary system is significantly less than in those without a formulary system. Of course, the reasons for brand duplication may be a combination of several of those listed.

5.3 Flexibility of the Formulary System

Methods of handling physicians' requests for drugs not stocked routinely in the pharmacy are shown in Table 97 (Q 24 and 27). Here we note that 7 out of 10 pharmacists operating under the formulary system order without delay the non-formulary drug requested and do this without prior consultation with the pharmacy and therapeutics committee. In contrast, 9 out of 10 pharmacists not operating under the formulary system order the drug at once. Thus, one may infer that the majority of pharmacists operating under the formulary system obtain the drug for the patient without delay and later have the request considered by the committee. This method of handling such requests provides the patient with the prescribed drug immediately, permits time for the pharmacist or physicians to assemble information with which to critically evaluate the drug, and obviates the need to call the committee together at frequent but irregular intervals.

There is evidence that question 26 was interpreted in two ways. Some evidently interpreted the question to refer to another brand of drug other than the one(s) carried in the pharmacy. Others inferred that the question, as it was originally intended, related to a basic drug different from any carried in the pharmacy, regardless of brand name. This is indirectly shown in both Tables 97 and 98 which refer to actions taken by the pharmacy and therapeutics com-

TABLE 97. Flexibility of Formulary System to Provide for Request of Non-Formulary Drugs

Methods of Handling Physicians' Requests for Non-Stocked Drugs		Status of Formulary System (Percent of Hospitals Reporting)	
		Formulary System	Non-Formulary System
Action taken by the pharmacy	Drug requests ordered at once	70	90
	When drug request is not ordered at once, the physician is informed that the drug is not official in the formulary	92	—
Action taken by the pharmacy and therapeutics committee	Non-formulary drug requests:		
	1. Does not have to be considered by pharmacy and therapeutics committee; drug is ordered at once	68	—
	2. Must be approved for temporary stock before drug is ordered	17	—
	3. Must be approved for inclusion into the formulary before drug is ordered	54	—

TABLE 98. Flexibility of Formulary System in Hospitals Where Requests for Non-Formulary Drugs Must Have Committee Approval Before Being Ordered

Action Taken by Pharmacy and Therapeutics Committee for Requests of Non-Formulary Drug	Percent Response
Length of time for review of drug requests not ordered at once	
a. One day	33
b. 2–3 days	15
c. 4–7 days	12
d. 8–14 days	8
e. Over 14 days	32
Up to the time of consideration by the pharmacy and therapeutics committee, the patient receives:	
a. No drug	6
b. Another drug	40
c. Temporary supply of the drug requested	54

mittee upon requests for non-formulary drugs and in Table 94 which refers to the extent of brand duplication. Because of insufficient information we could not differentiate between the two interpretations.

More than 9 out of 10 pharmacists operating under the formulary system notify the physician that the requested drug, whether it be a brand of drug not stocked or another chemical entity, is not official in the formulary (Table 97). Therefore, it can be stated that the pharmacist invariably notifies the physician and it may be inferred that he may pursue four alternatives: (1) obtain the physician's decision as to whether or not he may dispense another brand of the drug, (2) inform the physician of drugs similar in action which are available in the pharmacy, *e.g.*, phthalylsulfathiazole instead of succinylsulfathiazole, and obtain the physician's decision regarding this, (3) tell the physician that his request must be approved by the committee or his department head before the drug can be ordered, or (4) decide that the physician's request cannot wait for committee approval and obtain the drug immediately.

In Table 97 we have seen that 70 percent of pharmacists immediately obtain the drug without consulting the committee. Thus, 30 percent of pharmacists imply that they must consult the committee before ordering the drug for the patient. However, as noted in Table 98, 54 percent of those who must refer such requests to the committee first procure a temporary supply of the drug for the patient (Q 27b). This means that about 86 percent of pharmacists operating under the formulary system first obtain the drug for the patient regardless of whether or not they are supposed to consult the committee prior to taking this action.

Almost 2 in 10 pharmacy and therapeutics committees must approve the drug before a temporary stock is ordered. This procedure is employed particularly in governmental, especially some federal, hospitals where the physician requesting the non-stocked item (brand or public named) must also obtain consent from his department head before the drug can be referred to the committee. This policy places a great responsibility on the committee to handle requests expeditiously so as not to delay treatment of the patient. We note, however, in Table 98 that 33 percent of committees review requests for new drugs in one day.

About 50 percent of the committees must officially approve the drug before it is included in the formulary (Table 97). This reply is difficult to interpret because one would expect that all committees would take action before a drug is officially approved—although it may be used on a temporary basis for a considerable period of time. This reply may reflect an informal method of operation of many committees, those which approve drugs officially being those which have established formal procedures while those lacking these procedures tend to let the drug be accepted without any specific action.

The length of time taken by pharmacy and therapeutics committees to review requests for those new drugs not ordered at once varies considerably. About one-third of the committees require only 1 day; 27 percent require from 2 to 7 days while the balance require from 8 to more than 14 days. Thus, we find that two-thirds of the committees require more than one day to handle requests and that, in more than two-thirds of the cases, the drug is ordered for the patient before the request is considered by the committee.

As shown in Table 98, in 40 percent of the pharmacies under the formulary system in which the request for the drug must be approved by the committee before it is ordered (this approval is not needed in 70 percent of hospitals), the patient is given another drug. Here again, we suspect, this may refer to either another basic drug of the same therapeutic group or to another brand of the same drug. Our information, however, is not sufficient to confirm this. Six percent of those patients for whom requested medication is not ordered at once receive no drug until the request is considered by the committee. We do not know the extent of delay involved. One-third of the committees act within one day, however, and we believe it is reasonable to conclude that, almost without exception, the patient receives a drug the same day a physician prescribes it.

RECOMMENDATIONS

8.8 ***Use of Nonproprietary Names.*** It is recommended that pharmacy and therapeutics committees adopt the policy of accepting drugs officially into the hospital's formulary under their nonproprietary names, even though trade names may be used as synonyms and as aids to prescribing and identifying drugs.

8.9 ***Authority for Nonproprietary Names.*** It is recommended that when medical staffs authorize the pharmacist to dispense drugs under their nonproprietary names when trade name drugs are prescribed, (1) this authorization be given in writing in a form approved by hospital attorneys, and (2) provision be made within this policy for a physician to obtain a particular manufacturer's product when he deems it important to the care of his patient.

8.10 Simplified Nonproprietary Names. It is recommended that the American Society of Hospital Pharmacists work with the Drug Nomenclature Committee of the American Medical Association, United States Pharmacopeia, and the National Formulary to develop simplified nonproprietary nomenclature.

8.11 Product Duplication. It is recommended that pharmacy and therapeutics committees review periodically the extent of product duplication in their hospitals with the objective of eliminating unnecessary duplications and retaining purposeful duplication of products, and that the initiative for this review be taken by the chief pharmacist.

8.12 Flexibility of Formulary System. It is recommended that pharmacy and therapeutics committees and chief pharmacists review their procedures of handling requests for drugs not stocked in the pharmacy, and that procedures be developed so that prescribed medication may be obtained for patients without undue delay, still retaining an orderly procedure for the selection and appraisal of therapeutic agents.

8.13 Nursing Representative on Pharmacy and Therapeutics Committee. It is recommended that the pharmacy and therapeutics committee include a representative of the nursing service on its membership.

IX

Professional education and training

1

INTRODUCTION

Two characteristics, among others, distinguish a profession. First, its practitioners possess a body of specialized knowledge embracing principles mastered by a planned system of education. This, of course, is above and beyond the liberal education society expects of all professional men. Second, but closely allied to the first, its practitioners assume responsibility for the training of newcomers entering the profession and for the continual retraining of all those in the profession.

1.1 Education

Pharmaceutical education has steadily improved over the years and the adoption of the basic five-year program in pharmacy is bound to result in better preparation of pharmacy graduates for professional practice. Hospital pharmacy is, however, a specialty within the profession and it is the consensus that the career hospital pharmacist will perform more effectively if he has an additional year of formal education beyond the five-year program. To meet this need, many colleges of pharmacy offer a Master of Science degree which in some cases is a terminal professional degree and in others a research degree requiring a thesis and a language. More recently, a few colleges of pharmacy offer the professional degree of Doctor of Pharmacy based on a six-year program. In addition, the research degree of Doctor of Philosophy is available to those planning a career in hospital pharmacy. Although relatively few in hospital practice hold this degree, it has many advantages for those pharmacists in the larger teaching institutions where research is an important function.

Pharmaceutical education has undergone many changes over the past few decades. The educational background of hospital pharmacists now in practice mirror these changes and reflect the gradual development of pharmaceutical education. As a result hospital pharmacists, depending on their age and school, differ greatly in their educational background and this could be expected to influence, at least to some extent, their professional practice.

1.2 Training

Work was begun by the American Society of Hospital Pharmacists in 1943 on a *Minimum Standard for Pharmacy Internship in Hospitals* and the standard was approved in 1951. This standard has undergone several revisions, the latest in 1963 when the title was changed to *Accreditation Standard for Residency in Hospital Pharmacy*. Providing standards for training that go far beyond state board requirements for licensure, this standard is now backed up by an accreditation program carried out by the American Society of Hospital Pharmacists.

Hospital pharmacists have thus recognized their professional responsibility for the training of future practitioners and are to be commended for the quality of the standard adopted. Still, much remains to be done to improve existing programs, to cull those found lacking in value, to discourage the establishment of training programs in hospitals with a narrow scope of service, and to encourage establishment of new programs in pharmacies offering a broad range of professional and scientific pharmacy service. Nor must the relationship between the preceptor and his staff to the success of a valuable residency program be neglected. In fact, the preceptor and his educational and professional background, his motivations and attitudes are fundamental to the success of a good residency program. Developmental work in these areas is one of the pressing needs of hospital pharmacy if the competence of future practitioners is to be improved markedly.

2

PROFESSIONAL EDUCATION

2.1 Degrees of Chief Pharmacists

Chief pharmacists differ considerably in their educational backgrounds as shown by Table 99. In studying this table one must bear in mind that there is considerable overlapping in the number of degrees held; for example, all those with a Master of Science degree also have a Bachelor's degree. About 62 percent hold the Bachelor of Science degree in pharmacy which, since 1932, has been the basic professional degree. A Master of Science degree is held by 4.3 percent of chief pharmacists; however, 6.9 percent of those with a Bachelor of Science degree also have a Master of Science degree. Only two chief pharmacists hold a Doctor of Philosophy degree; two others have an honorary Doctor of Science degree.

The professional degree of Doctor of Pharmacy is held by 1.2 percent of chief pharmacists. Of these, however, all except one were awarded prior to 1925 and thus represent from one to four years of academic work, in contrast to the current degree which represents a six-year program.

About 35 percent of chief pharmacists hold a degree of Graduate in Pharmacy (Ph.G.) or Pharmaceutical Chemistry (Ph.C.). Some of these also hold a Bachelor of Science or other degree. Some are also registered nurses.

The Master of Science is the principal graduate degree held by hospital pharmacists. Of the 58 who held this degree when this survey was taken, 36, or more than 60 percent, received it in 1947 or later. It was in 1947 that a number of colleges of pharmacy and hospitals began to offer combined programs in hospital pharmacy consisting of a formal internship in the hospital and graduate study in in the college. Of those chief pharmacists who have a Master of Science degree, 18, or 50 percent of those who received their degree in 1947 or thereafter, also served a formal internship based on the *Minimum Standard for Pharmacy Internship in Hospitals.*

Over 4 percent of hospital pharmacists hold a Bachelor of Arts degree while 1 percent have either a Master of Arts degree or a Master's degree other than in science. Sixty-seven chief pharmacists do not hold any degree, by reason of their becoming pharmacists prior to the requirement of college graduation as a prerequisite to licensure.

Although not reported in Table 99, it is interesting to note that 14 respondents hold degrees in nursing (R.N.); of these, 9 possess also a Bachelor of Science degree while 5 have either a Ph.C. or Ph.G. degree.

When interpreting Table 99 one must also bear in mind that there are still many in hospital pharmacy who received their degrees a number of years ago, before the efforts of the American Association of Colleges of Pharmacy and the American Council on Pharmaceutial Education toward standardizing the requirements for the various undergraduate programs in pharmacy. The great difference in the time required to obtain various degrees in pharmacy is shown by a quotation from a report delivered by A. Koch before the American Conference of Pharmaceutical Faculties in 1918:*

> The Ph.G. degree is conferred by 39 institutions for a two-years' course; the Ph.C. degree by 32 schools for a three-years' course, and by one school after 4 years; the degree of Bachelor of Science in Pharmacy by 20 schools for a four-years' course, by one for three years and by one for two years; the Doctor of Pharmacy degree by three schools for three years, by one for four years, by three schools for six years and by one for a seven-years' course. The Master of Pharmacy degree is conferred by one school for three years, and the Master of Science in Pharmacy by three schools for a five-years' course.

One may safely predict a significant rise in the number of hospital pharmacists with educational degrees beyond the basic Bachelor of Science degree. For example, the American Association of Colleges of Pharmacy in 1962 reported 85 candidates for the Master of Science degree, specializing in hospital pharmacy. Since most of these programs are combined with a formal internship and thus require two years to complete, about 42 candidates receive their degree each year. In addition, three or more colleges of pharmacy offer a Doctor of Pharmacy degree, with specialization in hospital pharmacy. We also know that a few pharmacists who obtain their Master of Science degree continue their graduate work and obtain a Doctor of Philosophy degree; however, we cannot document the number who follow this course.

If one assumes that education beyond the Bachelor of Science degree is essential, or a least highly desirable, for those planning a career in hospital phar-

TABLE 99. Educational Degrees Received by Chief Pharmacists Employed in Short-Term Hospitals of 100 Beds and Over

Educational Degrees	Chief Pharmacists Reporting Educational Degrees Received[1]	
	Number	Percent
Graduate in Pharmacy (Ph.G.) or Pharmaceutical Chemist (Ph.C.)	480	35.7
Bachelor of Science	844	62.7
Doctor of Pharmacy	16[2]	1.2
Master of Science	58	4.3
Doctor of Philosophy	2	—
Doctor of Science	2	—
Bachelor of Arts	57	4.2
Master of Arts, etc.	13	1.0
Total number of chief pharmacists reporting	1346	

[1]67 Chief pharmacists did not receive any degree.
[2]All but one received degree prior to 1925.

* Cited by Kremers, E. and Urdang, G.: *History of Pharmacy,* Lippincott Co., 2nd Ed., Philadelphia 1951, p. 308.

macy, there is still the question of the character of the program and the choice of a degree beyond the basic professional degree. The Doctor of Pharmacy degree offers advantages to those in hospital practice, advantages which are inherent in neither the Bachelor of Science nor the Master of Science degree. The degree itself has a level of professional standing which is commensurate with the professional degrees of medicine and dentistry. This is important in hospital pharmacy practice, carried on as it is in an environment where recognized professional doctorate degrees are essential for influence and prestige. This need has been well expressed in the *General Report of the Pharmaceutical Survey* (page 103):

> The Bachelor's degree does not, however, confer the status that is desired by pharmacists, particularly those who work in rather intimate professional association with physicians, dentists, and members of other health professions who hold professional doctor's degrees.

We believe there are good arguments for both the Master of Science and the Doctor of Pharmacy degree programs in hospital pharmacy. There are too few schools offering the latter and too much variation among the programs in the schools offering the former to generalize that one program *per se* is better than the other. We have come to a belief, however, that the Doctor of Pharmacy program probably has advantages in creating superior practitioners that will make it preferred for that purpose to the Master of Science program. We also believe that the Doctor of Pharmacy degree program lends itself to preparation for research at a level equal to that of the Master of Science programs. We appreciate the difficulties of making this degree the basic degree for pharmacy generally. The role of the vast majority of community pharmacists scarcely makes demands high enough and consistent enough to support a professional doctorate. This is not true in hospital practice.

Regardless of the degree, the practice of hospital pharmacy should be consistently improved as more practitioners with training beyond the Bachelor's degree enter the field. A hospital pharmacist has at least five major areas of responsibility, each of which calls for special skills and requires specialized education and training. Within the modern hospital, the pharmacist functions as the manager of a department whose efficient operation is of great importance to the hospital; he is a consultant to the medical and allied staffs on matters related to drugs as well as a coordinator who implements decisions regarding them; in the area of pharmacy *per se* he is the authority on procurement, storage, manufacturing, control, dispensing, and related activities including the handling of investigational drugs; he is a teacher, instructing, formally and informally, students and practitioners of the allied health professions; and he is an investigator in the field of management methods and of professional and scientific problems.

No one pharmacist, however, will perform with equal capability within each of these areas. A pharmacist is an individual; pharmacy is a personal professional practice within which one has opportunities to develop his special interests and skills. Some will obtain their greatest satisfaction from their consulting role while having little motivation, as an example, for teaching. Thus, they will minimize teaching and emphasize consulting. Others will direct their best efforts toward the areas of manufacturing, product development, control and investigation while tending to minimize management or teaching activities. Nevertheless, each pharmacist has a responsibility to himself, his profession, and his hospital to work to some extent within each of the five areas mentioned. There exists the need for minimum contributions in each of these areas, though the pharmacist may go far beyond the expected minimum in certain ones. The problem of defining these minimums is important.

Hospital pharmacy will improve as pharmacists become well-trained in mathematics, the physical and biological sciences, and in professional areas. Mathematics, including calculus and statistics, is an essential tool with which the quantitative approach to pharmaceutical science and technology provides a common point at which the pharmacist, physician and investigator meet in closer understanding and common endeavors. Quality courses in the physical and biological sciences form the foundation for the pharmacist's professional courses. The professional courses supply the body of knowledge which is pharmacy's alone and upon which its existence as a profession rests. With these tools, then, the pharmacist can readily fulfill four out of the five responsibilities mentioned and be able to select one or more areas in which his contributions may be especially rewarding.

Hospital pharmacists will make their greatest professional contributions in direct proportion to the soundness of their scientific and professional training. In addition, however, they need to understand the principles of management and the use of management tools. These tools are important for achieving professional objectives. It is well to remember, however, that hospitals have numerous qualified resource people trained in business and management; they have a shortage of those trained in pharmacy.

Many and varied opportunities for research exist in hospitals. This is true particularly in hospitals associated with universities, but also in others. Hospital pharmacists have, however, made relatively few contributions to the research literature. Thus far, education at the Master's level has not wrought any significant change. The correction of this deficiency is, we believe, one of the major problems of hospital pharmacy. And in this connection, it is obvious that training of additional hospital pharmacists at the Doctor of Philosophy level may be the most effective answer to this problem, but not the sole answer. When contrasted with the contributions of their European counterparts, research activities of American hospital pharmacists are of minor significance. As noted in

TABLE 100. Attitudes Toward Desirability of a Professional Degree of Doctor of Pharmacy According to Age of Chief Pharmacists

Attitude Toward Professional Degree of Doctor of Pharmacy	Age of Chief Pharmacists (Percent of Chief Pharmacists Reporting)					
	20–29	30–39	40–49	50–59	60 or Over	All Ages
Yes	56	54	46	41	35	47
No	44	46	54	59	65	53
Total number of chief pharmacists reporting	(210)	(360)	(306)	(284)	(151)	(1311)

Data is based on responses from 1346 chief pharmacists from short-term hospitals, 100 beds and over; 35 chief pharmacists did not respond.

TABLE 101. Attitude of Chief Pharmacists Toward Desirability of Professional Degree of Doctor of Pharmacy with Years of Undergraduate Pharmaceutical Education

Attitude Toward Professional Degree of Doctor of Pharmacy	Years of Undergraduate Pharmaceutical Education (Percent of Chief Pharmacists Reporting)					
	None	1–3 Years	4 Years	5 Years	6 Years	Total
Yes	43	40	50	57	43	47
No	57	60	50	43	57	53
Total number of chief pharmacists reporting	(67)	(301)	(753)	(98)	(51)	(1270)

Data is based on 1346 chief pharmacists from short-term hospitals, 100 beds and over; 76 chief pharmacists did not respond.

Chapter VII, however, almost 8 out of 10 hospital pharmacists enjoy product formulation and investigational work and believe these functions should be a part of their job. Better education and training to prepare them for these tasks, coupled with high motivation, will necessarily lead on to greater accomplishments in the future.

2.2 Attitude Toward Doctor of Pharmacy Degree

More than half of the chief pharmacists under 40 years of age and less than half of those over 40 believe that the professional degree of Doctor of Pharmacy, awarded after a six-year academic program, is desirable. Results are tabulated in Table 100 (Q 60) and shown in Figure 58. It is evident that the attitude of the respondent varies in correlation with age; about two-thirds of those over 60 years of age do not believe this degree is desirable.

When the attitude toward the Doctor of Pharmacy degree is related to the number of years of undergraduate education of the respondent, we find that about 4 in 10 of those with less than four years of undergraduate education favor the degree. On the other hand, about 5 in 10 of those with four years or more of undergraduate education favor it (Table 101).

These attitudes toward the Doctor of Pharmacy degree are interesting. There is no question that early in the century the Doctor of Pharmacy was a "cheap" degree, as was the M.D. degree. In the quotation cited by Urdang and Kremers, we have noted the lack of uniformity in requirements for this degree. Unlike medicine, however, pharmacy chose to drop the degree rather than to strength it. And thus it remained until Elliott, in the *General Report of the Pharmaceutical Survey*, recommended "the establishment of a six-year program of education and training leading to the professional degree of Doctor of Pharmacy (Phar.D.), this program to include two or more years of general education and basic science training."* It was not intended that all schools offer this degree nor that all pharmacists receive it. In fact, the continuation of the basic course, then four years in pharmacy, was recommended as the minimum mandatory education for the practice of pharmacy.

The first six-year program in pharmacy was adopted at the University of Southern California in

* Elliott, E. C.: *The General Report of the Pharmaceutical Survey*, 1946–9, American Council on Education, p. 230, Washington, D. C., 1950.

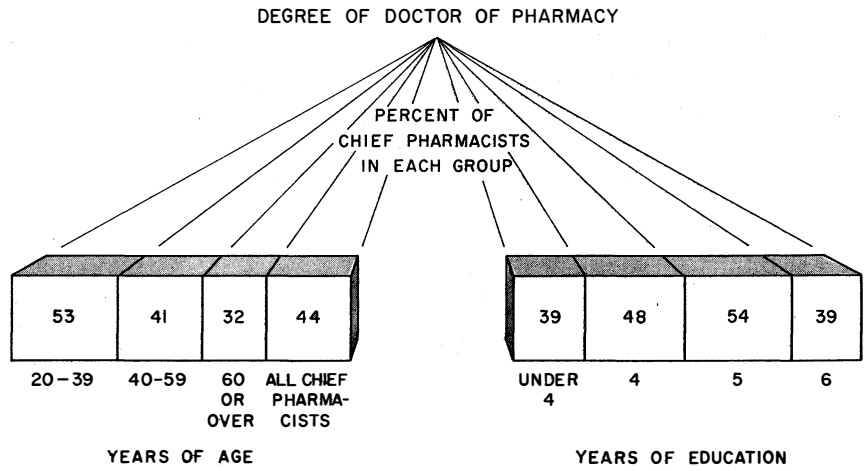


FIGURE 58. Positive Attitude Toward Desirability of Professional Degree of Doctor of Pharmacy

1949; the University of California began its program in 1956. These are the only two schools where the six-year program is mandatory; in a few other schools it is optional. The University of Michigan adopted the six-year program leading to the Doctor of Pharmacy degree, replacing its former Master of Science program for hospital pharmacy, in 1962.

The fundamental question appears to be whether there is a body of knowledge in pharmacy which can and should be used by its *practitioners* that merits the awarding of a professional doctorate. This question should not be confused with the merits of the Doctor of Philosophy degree which is well recognized on its own merits as an essential degree for fundamental research and teaching. We believe that, in hospital practice, pharmacists do have the opportunity to apply a body of pharmaceutical knowledge to a depth that merits education to the level of a professional doctorate; and that that body of knowledge will stand favorable comparison with those of other professional degrees, including the M.D. and D.D.S.

2.3 Years of Undergraduate Education

The number of years of undergraduate education received by hospital pharmacists holding various positions within the pharmacy department is shown in Table 102. As noted in the totals, 74 percent of all hospital pharmacists have received at least four years of undergraduate education; 22 percent have received from one to three years, while 4 percent have had no undergraduate education in pharmacy.

A higher percentage of pharmacists below the level of the chief pharmacist have received four or more years of undergraduate education. The percentage of those with four or more years of undergraduate education is higher for both supervisory and staff pharmacists (both 79 percent) than it is for chief pharmacists (71 percent) or assistant chief pharmacists (76 percent). At the same time, a greater percentage of assistant chief pharmacists than chief pharmacists have received at least four years of undergraduate education. This may be explained by the probability that chief pharmacists are, in general, older than the other staff members. In fact, 25 percent of chief pharmacists have but 1 to 3 years of undergraduate education and most of these received their degree before 1932, when the four-year course was made mandatory by accredited colleges of pharmacy. Of course, the first graduates of the four-year program did not appear in any significant numbers until 1936. Prior to 1932, few schools offered a mandatory four-year program, although the University of Wisconsin offered a voluntary four-year program as early as 1892.

It is interesting to note that 4 percent of chief pharmacists and 4 percent of all hospital pharmacists have no undergraduate pharmaceutical education. These represent for the most part, we believe, older pharmacists who served an apprenticeship and became licensed by examination in their states prior to the establishment of formal educational standards.

Seven percent of chief pharmacists and 5 percent of all pharmacists reported 5 years of undergraduate pharmaceutical education. Undoubtedly some of these are graduates of a five-year program in pharmacy. Others may have had one or two years of prepharmacy education prior to enrolling in a college of pharmacy. Many of those responding to the questionnaire, however, included all of the years spent in college, and recorded time devoted to non-pharmaceutical areas of instruction. For example, a pharmacist who had received a Bachelor of Science and a Bachelor of Arts included the total number of years spent for both degrees. Thus, the percentage of pharmacists reported as having five and six years of undergraduate *pharmaceutical* education is exaggerated.

Normal processes will produce a rather rapid rise in the number of hospital pharmacists having at least four years of undergraduate pharmaceutical education, and a much slower rise in the number of those with a professional degree received following a five- or six-year program.

TABLE 102. Years of Undergraduate Pharmaceutical Education Received by Hospital Pharmacists

Position	Percent of Pharmacists Who Received Undergraduate Pharmaceutical Education					Total Number of Pharmacists
	None	1–3 Years	4 Years	5 Years	6 Years	
Chief Pharmacist	4	25	60	7	4	1853
Assistant Chief Pharmacist	5	19	70	4	2	693
Supervisor Pharmacist	8	13	75	2	2	125
Part-time or relief Pharmacist	7	27	62	2	2	289
Staff Pharmacist	4	18	74	2	2	1064
Average	4	22	66	5	3	100

4024 Total number of pharmacists.

2.4 Degree of Satisfaction with Educational Background

The degree of satisfaction chief pharmacists feel with their educational preparation for hospital pharmacy practice is shown in Table 103 (Q 59 and 59a). In general, chief pharmacists tend to feel that the education they have, regardless of its level, has prepared them *well or very well* for hospital pharmacy practice. Only 5 percent more of those with a Master of Science degree, than of those with a Ph.G. or Ph.C. degree, feel *very well to well* prepared—and these degrees represent significantly different levels of education. Of course, a contributing factor is one of age, maturity, and experience. Holders of the Ph.G. and

TABLE 103. Degree of Satisfaction Chief Pharmacists Feel with Their Educational Preparation for Hospital Pharmacy Practice

Degree of Satisfaction	Percent of Chief Pharmacists Reporting, According to Level of Education Received				
	Ph.G. or Ph.C.	B.S.	Pharm. D.	M.S.	Ph.D. or D.Sc.
Very well to well	63	60	56	68	75
Fair	29	29	38	30	0
Not too well to very poor	8	11	6	2	25
Total number	(480)	(844)	(16)	(58)	(4)

1346 Chief pharmacists reporting, but data excludes 67 chief pharmacists who received no degree of any type.

Ph.C. degrees are older, more mature, more experienced pharmacists who have been in practice for many more years than have those with the Master's degree. Other considerations are also involved. In general, the group with the Master's degree tends to be young and relatively inexperienced. Many have recently taken new jobs which represent their first experience in dealing with problems, and planning and organizing a department. Many of these jobs are with larger teaching hospitals where great demands for a wide variety of improved pharmaceutical services exist. Many of these younger pharmacists have high motivations and see more things to do and want to do more of these things than do some of their older colleagues who have been in practice for many years. Faced with many challenges and opportunities it is not surprising that this younger, less experienced group does not record a higher degree of satisfaction with their educational background.

2.5 Years of Education and Adequacy of Preparation

A comparison of how well chief pharmacists feel prepared for hospital pharmacy practice, with the number of years of undergraduate pharmaceutical experience they have had is shown in Table 104. Whether they have had as little as one or as much as five years of undergraduate pharmaceutical education, about 60 percent of chief pharmacists tend to feel *well to very well* prepared. About 80 percent of those with six years' education feel *well to very well* prepared. In responding to the questionnaire most pharmacists did not differentiate between general undergraduate education and pharmaceutical education. Thus, only a small percentage of respondents in the six-year column, for example, represent graduates of a six-year pharmacy program.

TABLE 104. Comparison of How Well Chief Pharmacists Feel Prepared for Hospital Pharmacy Practice with Number of Years of Undergraduate Pharmaceutical Education Received

Degree of Satisfaction with Undergraduate Pharmacy Education	Years of Undergraduate Education (Percent of Chief Pharmacists Reporting)				
	1–3 Years	4 Years	5 Years	6 Years	All Chief Pharmacists
Very well to well	60	61	57	81	61
Fair	28	29	31	15	28
Not too well to very poor	12	10	12	4	11
Total number	(301)	(753)	(98)	(51)	(1203)

Excluding 67 chief pharmacists who did not receive any undergraduate pharmacy education; 76 chief pharmacists did not respond.

2.6 Areas of Educational Need

Areas of knowledge in which chief pharmacists feel they should have received additional education are shown in Table 105 (Q 54). More than half of all chief pharmacists feel the need for more education in the biological sciences, including biochemistry and pharmacology. More than half also feel the need for more education in subjects related to business administration, including management and accounting. Paradoxically, those without any undergraduate pharmaceutical education feel this need less.

In answer to a related question (45e), 79 percent of those responding felt they could be more helpful to physicians and nurses in supplying information on actions, uses, side effects, etc., of drugs if they had received a well planned sequence of courses in the biological sciences.

Less than 1 chief pharmacist in 6 feels the need for additional education in the physical sciences represented by such courses as mathematics, physics, and physical pharmacy. Considerably more need for those subjects is felt among the two groups with the least undergraduate education.

Somewhat less than 1 chief pharmacist in 4 feels the need for additional courses in general education including literature, social sciences, and the arts. About 1 chief pharmacist in 10 does not feel the need for additional education in any area.

We have noted, in general, that chief pharmacists tend to feel satisfied with the educational background they have regardless of the number of years of education involved or the degree received. Part of the answer to this paradox may be related to the scope of service offered in hospital pharmacies or the type of work that hospital pharmacists perform. In Chapter VII we mentioned the considerable variation in the scope of service offered by hospital pharmacists. In general, hospital pharmacists are strong in the dispensing and consulting functions but weak in most others. Many of them do not and do not want to operate a bulk compounding program, to do product development or research, to operate a control program, to teach, or to prepare sterile products. In fact, almost twice as many central supply departments as pharmacies are responsible for the preparation of intravenous fluids when they are made in the hospital. The lack of control procedures, analytical and otherwise, is a serious shortcoming. Many hospital

TABLE 105. Areas in Which Chief Pharmacists Feel They Should Have Received Additional Education

Areas	Years of Undergraduate Pharmacy Education (Percent of Chief Pharmacists Reporting)					
	None	1–3 Years	4 Years	5 Years	6 Years	All Chief Pharmacists
Biological sciences (biochemistry, pharmacology, physiology, anatomy, etc.)	58	68	67	58	51	65
Physical sciences (physics, physical pharmacy, mathematics, etc.)	25	19	14	13	13	16
Business administration (economics, management, administration, accounting, etc.)	40	48	59	55	60	55
Pharmacy and chemistry (dispensing, pharmaceutical and organic chemistry, product formulation, etc.)	54	36	29	32	24	32
General education and the arts	26	22	24	19	27	22
Doesn't feel need for additional education	5	9	6	8	20	8
Total number	(67)	(301)	(753)	(98)	(51)	(1270)

76 Chief pharmacists did not respond.

pharmacists do not maintain sufficient records to allow them to gauge workload and other needs of their department.

It appears, therefore, that many hospital pharmacists do not feel the need for additional education because they confine their activities primarily to a distributive function. If one removes all manufacturing, all product development, all teaching, all assay and control, all research, all preparation and sterilization of sterile products from the practice of pharmacy—wherein does the pharmacist use the body of knowledge that is uniquely his? He uses it only to the extent and to the depth required by the dispensing function, and by the consulting function on a relatively general level. This is one condition which must be changed if hospital pharmacy is to improve.

Several factors probably contribute to the relatively narrow scope of pharmaceutical service in hospitals and the lack of interest among hospital pharmacists in expanding the range of their activities. Among these are: the general pattern of the practice of American pharmacy, which is primarily a dispensing function; the fact that most hospital pharmacists today have received most of their training in community pharmacies where the distributive function predominates; and the fact that hospital pharmacists are the products of colleges of pharmacy which train students primarily for practice in community pharmacies.

With these thoughts in mind, the advisability of establishing a specialized school of pharmacy for the education of career hospital practitioners has been discussed.* Until the results that might be achieved by such a special school can be assessed, we recommend active experimentation with course patterns within the Master of Science and Doctor of Pharmacy degree programs that may best prepare and motivate those students preparing for hospital pharmacy so they may practice at a scope and level well beyond present average objectives. One prerequisite for adequate progress in this direction may well be the establishment of a full chair in hospital pharmacy as a regular faculty position in a number of the stronger schools of pharmacy. Also, attention must be given to providing undergraduate courses in hospital pharmacy since more and more students are going into hospitals to practice. More hospital pharmacists should be encouraged to enter the Doctor of Philosophy program.

* Francke, D. E.: An American School of Hospital Pharmacy, *Am. J. Hosp. Pharm. 16*:53 (February) 1959.

RECOMMENDATIONS

9.1 Six-Year Professional Curriculum. It is recommended that colleges of pharmacy, in which the Master of Science degree requires neither a language nor a thesis and is not a research degree, be encouraged to offer a unified six-year program for hospital pharmacy, for which the professional degree of Doctor of Pharmacy would be appropriate.

9.2 Doctor of Philosophy Degree. It is recommended that selected hospital pharmacists be encouraged to obtain a Doctor of Philosophy degree.

9.3 Undergraduate Courses. It is recommended that the colleges of pharmacy be encouraged to establish undergraduate courses in hospital pharmacy which will provide an orientation in hospital pharmacy for those who enter the field without further training, and for future community practitioners who may be called upon to provide service to a small hospital or nursing home.

9.4 New Concepts in Hospital Pharmacy Instruction. It is recommended that the American Society of Hospital Pharmacists study (1) the feasibility of fostering the establishment of a specialized school of hospital pharmacy as an integral part of a major university with a strong medical center, and (2) the means for testing the outer limits of serviceability to the needs of hospital pharmacy of the six-year professional curriculum and the Master of Science degree program in present schools of pharmacy, on the basis of a specialization expressed through special facilities, a separate hospital pharmacy curriculum, and the establishment of full chairs of hospital pharmacy, and

It is further recommended that the American Association of Colleges of Pharmacy and the American Council on Pharmaceutical Education be invited to name representatives to participate as members of this study group.

9.5 Broadening the Pharmacology Education of Future Pharmacists. It is recommended that colleges of pharmacy be encouraged to utilize the facilities and the opportunities which exist in today's hospitals in the teaching of pharmacology so that students may gain first-hand experience in the action of drugs on patients and develop their skills as drug consultants.

9.6 Clinical Professional Practice. It is recommended that colleges of pharmacy be encouraged to utilize the facilities of the hospital pharmacy to expand their "dispensing" courses to a broader course encompassing clinical professional practice.

3

PROFESSIONAL TRAINING

3.1 Types of Internships Served

The types of internships or apprenticeships served by chief pharmacists and staff pharmacists are shown in Table 106 (Q 55, 55a, 56, 56a, 57, 57a).

In this discussion the words intern and internship and resident and residency will be used interchangeably. The former *Minimum Standard for Pharmacy Internship in Hospitals* is now known as the *Accreditation Standard for Residency in Hospital Pharmacy.*

An internship or residency based on the *Accreditation Standard for Residency in Hospital Pharmacy** (Q 55) requires 2000 hours of supervised instruction in the areas of hospital pharmacy administration, inpatient and outpatient dispensing, formulation, preparation and control of sterile and non-sterile products, together with other special collateral duties. Qualifications are also set forth for the training hospital, the preceptor, the pharmacy department, and the intern. An apprenticeship in a hospital (Q 56) may also be called an internship, but it is an informal type of supervised experience in which the preceptor does not commit himself to the scope of training set forth in the Standard. Thus, an intern may not spend any appreciable time in preparing sterile medicaments, general manufacturing, or with problems related to the management of the pharmacy. He may do little more than meet the state's requirement of practical experience for licensure. The scope of professional activity required of those who obtain their practical experience or apprenticeship in a community pharmacy varies considerably among the 50 states but, in general, a pharmacy filling 5 or 100 prescriptions a day is authorized to accept an apprentice.

The *Accreditation Standard for Residency in Hospital Pharmacy* is a standard for the *training* of hospital pharmacists; it is applicable to all pharmacy residencies meeting its requirements, whether or not the residents take additional academic work beyond the Bachelor of Science degree. It is the considered

TABLE 106. Distribution of Hospital Pharmacists According to Type of Internship or Apprenticeship Served

Position	Number of Pharmacists	Percent of Pharmacists Who Have Completed: Internship Based on Minimum Standard	Apprenticeship in Hospital	Apprenticeship in Community Pharmacy
Chief pharmacists	1853	9	27	77
All other pharmacists	2171	9	24	84
Average	100	9	25	81

4024 Total number pharmacists

opinion of the American Society of Hospital Pharmacists that there is a need for both types of programs—those in which the resident is enrolled for an advanced degree and those in which he gains the experience of the residency training without further formal academic work.

The Standard provides that the pharmacist in charge of the hospital pharmacy shall direct the residency program, even though the program may be combined with academic work leading to an advanced degree. This implies that he has the authority to say "yes" and "no" although, of course, he may be advised by someone from the college faculty.

The hospital, itself, must be one accredited by the Joint Commission on Accreditation of Hospitals. The pharmacy must comply with the *Minimum Standard for Pharmacies in Hospitals.*

In his training program, the resident should be given supervised instruction in the following areas: (1) outpatient dispensing, 250 hours, (2) inpatient and general dispensing, 320 hours, (3) formulation, preparation, and control of sterile products, 320 hours, (4) formulation, preparation, and control of non-sterile products, 320 hours, (5) pharmacy administration, 480 hours, (6) collateral and interdepartmental special activities, 185 hours, and (7) lectures and conferences, 125 hours, for a total of 2000 hours. Collateral duties of the resident involve teaching, attending clinical and therapeutic conferences, investigation, and observation at nearby hospital pharmacies.

This outline of activities, assuming both the preceptor and resident are highly motivated and have good scientific and professional backgrounds, should provide reasonable training for the neophyte hospital pharmacist. Those programs in which additional academic course work is offered should provide the resident with even greater benefits. There are two basic requirements for a good residency program: one is a highly motivated director of the program, one who strives to provide educational challenges and opportunities for the residents; the other is a pharmacy department offering a wide scope of service.

According to the findings of this survey, the great majority, over 8 out of 10, of all hospital pharmacists have gained their experience in a community phar-

* *Am. J. Hosp. Pharm. 20*:378 (August) 1963.

macy. Only about 1 in 4 has served an apprenticeship in a hospital pharmacy. Less than 1 in 10 hospital pharmacists has served a formal internship based on the *Minimum Standard for Pharmacy Internship in Hospitals.*

Combining the totals for the internship based on the Minimum Standard with those who served an apprenticeship in a hospital, we note that about 1 in 3 chief pharmacists and staff pharmacists has had all or a portion of his training in hospitals. There is a certain amount of duplication in the types of internships served. For example, the percentages of chief pharmacists total 113 and thus 13 percent of them have served more than one type of internship, usually in a community pharmacy, in addition to their formal internship or informal apprenticeship in a hospital. This may be due to some state board requirements which permit only six months credit for hospital experience. Or, again, it may be due to the fact that a pharmacy student obtains a portion of his apprenticeship by summer work in a community pharmacy and completes it later in a hospital pharmacy.

The most striking finding relative to the type of internships served is that very few hospital pharmacists have been exposed to a formal internship based on the *Minimum Standard for Pharmacy Internship in Hospitals.*

TABLE 107. Areas in Which Chief Pharmacists Feel They Should Have Received Additional Training During Internship or Apprenticeship

Areas	All Chief Pharmacists (Percent)	Percent of Chief Pharmacists Who Completed Internship Based on Minimum Standard	Served an Apprenticeship in Hospital Pharmacy	Served an Apprenticeship in Community Pharmacy
Dispensing	9	10	8	9
Compounding	10	13	11	10
Manufacturing	28	21	31	29
Product development	24	21	26	26
Administrative skills	50	55	57	49
Personnel management	34	33	37	34
Skills in communication	24	27	28	22
Ability to organize	25	29	29	24
Does not feel need for additional training	14	12	13	15
No answer	10	9	5	10
Total number	(1346)	(121)	(373)	(1015)

3.2 Areas of Needed Internship Training

The areas in which chief pharmacists feel they should have received additional training during their internship (residency) or apprenticeship are shown in Table 107 (Q 58). It is interesting to note that 4 out of 6 of the areas of greatest need lie in the management field, that is, in the areas of administrative skills, personnel management, ability to organize, and skills in communication. The next two needs, in order of frequency, are in manufacturing and product development. Relatively few chief pharmacists feel a need for additional training in compounding or dispensing, while 14 percent do not feel a need for additional training in any of the areas mentioned. Of course, in interpreting this material one must bear in mind that many respondents have served more than one type of internship, and thus many of the responses do not relate solely to one type of training experience to the exclusion of others.

The area of greatest felt need is that of administrative skills. Here about one-half of all chief pharmacists feel the need for additional training. It is somewhat surprising that those who have completed a formal internship or an apprenticeship in a hospital pharmacy feel this need to a greater extent than those who served an apprenticeship in a community pharmacy. This same relationship exists relative to the ability to organize, and skills in communication. In the area of personnel management there is less difference in need felt by those who have served the various types of internships.

Only in the professional areas of manufacturing and product development does the hospital internship more fully satisfy the felt needs of chief pharmacists. And here it is only those who have completed a hospital internship based on the Standard who feel less need than those who have completed their training in a community pharmacy; those who have served an apprenticeship in a hospital pharmacy feel a need for additional training in compounding and manufacturing to a greater extent than those who received their training in a community pharmacy. The differences here are not, however, significant.

One may conclude from these findings that, in general, those who have received their training in hospital pharmacies feel somewhat less prepared for hospital practice than those who received their training in community pharmacies. Of course, we must recognize that those pharmacists who have completed their internship based on the Standard are, in general, much younger, less experienced, and less mature than those who have received their apprenticeship in a community pharmacy. When this is considered, the relatively small differences between the two groups lose much of their significance. Furthermore, the greatest differences between these two groups lie in the area of working with people—administrative skills, personnel management, skills in communication, and ability to organize. To a great extent, even after the principles are taught, these skills are developed by practice and thus are influenced greatly by the years of experience and maturity of the pharmacist.

Perhaps the greatest significance of these findings is the need they show to review and improve internship or residency training in hospital pharmacy in all its aspects.

3.3 Influence of Internship

In order to obtain a more precise evaluation of the effect educational background and the type of internship served have on the degree of satisfaction chief pharmacists feel, an analysis was made of those who have both the Bachelor's and Master's degrees and who have served different types of internships. Results are shown in Table 108.

Almost 70 percent of chief pharmacists with both a Bachelor's and Master's degree, together with a formal internship in hospital pharmacy, feel *well to very well* satisfied with their educational background. Only about 30 percent of these same chief pharmacists felt the same degree of satisfaction with their Bachelor's degree alone and without their formal internship.

On the other hand, chief pharmacists with both degrees but lacking a formal internship in hospital pharmacy based on the Standard reported no difference, at the level of *very well to well*, in feelings of satisfaction with their educational background as between the Bachelor's and Master's degrees. Thus, it seems that the formal internship based on the Standard fosters a much greater feeling of satisfaction among recipients than do the less formal types of internships or apprenticeships.

Nevertheless, when this same subsample is used to compare the areas in which chief pharmacists believe they should have received additional training during their internship, those with a formal internship based on the Standard expressed greater need than those who served an informal internship! This is shown in the middle section of Table 109. To conserve space, we have omitted the percentages for personnel management, skills in communication, and ability to organize. A significantly higher percentage of those with a formal internship, however, felt more need for training in these areas than did those with the informal internship. One also notes that these same pharmacists felt they should have had more courses in business administration in their formal educational program offered by the college of pharmacy. In fact the same percentage felt they should have received both additional education and training in this area.

We also note differences in the areas of educational need felt by these two groups (Table 109). More of those with the formal internship felt a need for additional courses in the biological sciences and business administration, when compared with the pharmacists who served an informal internship. On the other hand, those with the informal internship felt a greater need for educational courses in the physical sciences and pharmacy and chemistry. Also, 14 percent of those with an informal internship felt no need for any additional education.

We cannot explain the reason why those with the formal internship felt a greater need for additional training than did those with an informal internship. We can only postulate that it may be similar to the reason for the findings in Table 105 where those with four or more years of undergraduate education felt a greater need for additional education than did those with less than four years.

We attempted to relate the needs felt for additional education and training to the scope of service offered by this subsample. We note that, in general, those with a formal internship tend to *provide or want to provide* a wider scope of service than do those with an informal internship. This is true of those providing a bulk manufacturing program, sterile solutions manufacturing program, drug information service, formulary system, product development and research, and training responsibilities. It is interesting to note, however, that only 13 percent of those with a formal internship felt a need for more education in the physical sciences and pharmacy and chemistry, despite the fact that about 80 percent of them want to

TABLE 108. Comparison of How Well Chief Pharmacists Holding Both a Bachelor's and Master's Degree Feel These Degrees Prepare Them for Hospital Pharmacy, in Relationship to the Type of Internship

Educational Degree	Degree of Satisfaction with Level of Education Received (Percent of Total)			Percent, No Response	Total Number of Chief Pharmacists
	Very Well to Well	Fair	Not Too Well to Very Poor		
Bachelor of Science	31	50	19	0	16
Master of Science with formal internship in hospital pharmacy	69	19	0	12	
Bachelor of Science	50	29	17	4	42
Master of Science with informal internship or apprenticeship in community pharmacy	50	12	2	36	
Bachelor of Science, All	45	35	17	3	58
Master of Science, All	55	14	2	29	

TABLE 109. Educational Needs Felt by Chief Pharmacists with a Master's Degree, with and without Formal Internship in Hospital Pharmacy

Areas in Education Felt Needed	Master's Degree with Formal Internship in Hospital Pharmacy (Percent)	Master's Degree with Informal Internship or Apprenticeship in Community Pharmacy (Percent)
General need felt for additional education in		
Biological sciences	81	60
Physical sciences	13	33
Business administration	94	50
Pharmacy and chemistry	13	24
No need	—	14
Need felt for additional training during apprenticeship or internship in		
Manufacturing	25	21
Product development	44	40
Administrative skills	94	48
No need	6	19

Scope of pharmacy service	Now Provide	Would Like to Provide	Now Provide	Would Like to Provide
Bulk manufacturing	56	25	52	7
Sterile solutions manufacturing	31	38	19	24
Drug information service	87	13	81	10
Formulary system	63	31	67	19
Product development and research	31	50	17	36
Teaching	63	31	43	17
Number of chief pharmacists reporting	(16)		(42)	

provide more manufacturing and product development in their pharmacy, each of which is based upon the principles taught in the physical sciences and pharmacy and chemistry. In fact, about 8 out of 10 of this group felt their greatest educational need was in the biological sciences. One is led to the conclusion that hospital pharmacists tend to overlook or underestimate the significance of sound educational courses in the physical sciences and pharmacy and chemistry and the relationship this background has to sterile and non-sterile manufacturing, product development and assay. One may also infer that pharmacists look to their internship to provide them with training in manufacturing and product development, rather than to their formal educational program in the college of pharmacy.

RECOMMENDATIONS

9.7 Residency Accreditation. It is recommended that the accreditation program of the American Society of Hospital Pharmacists be used to stimulate improvement in hospital pharmacy residency programs, and that selected programs be encouraged to offer training in central sterile supply, radiopharmaceuticals and other special areas of practice.

9.8 Seminars for Directors of Residency Programs. It is recommended that the American Society of Hospital Pharmacists sponsor seminars for directors of hospital pharmacy residency programs at least every two years for the next ten years, and as often thereafter as required.

9.9 Independent Residencies. It is recommended that hospital pharmacists not associated with colleges of pharmacy be made more aware of their professional responsibility to train future practitioners through well-organized residency programs and be encouraged to offer such training.

4

NON-ACADEMIC REFRESHER PROGRAMS—INSTITUTES

4.1 Number of Institutes Attended

The education of an individual is only well begun when he receives his professional degree. Hospital pharmacists early recognized this truth and took the initiative to establish short-term programs of instruction to provide practitioners with knowledge of new developments in their field of specialization. These post-graduate, or in-service training programs in hospital pharmacy are called "institutes."

The number of chief pharmacists who have attended one or more of the institutes on hospital pharmacy sponsored either by the American Hospital Association or the Catholic Hospital Association, in cooperation with the American Society of Hospital Pharmacists and the American Pharmaceutical Association, is shown in Table 110 (Q 51). Twenty-five of these institutes were conducted from 1946 through 1957, inclusively. These programs were attended by approximately 3000 hospital pharmacists.

About 50 percent of all chief pharmacists have attended one or more of these refresher programs; 23 percent have attended one; 12 percent have attended two, while 16 percent have attended three or more.

The institutes are essentially five-day refresher programs in hospital pharmacy. Both administrative and professional subjects are reviewed and discussed. These programs give hospital pharmacists an opportunity to evaluate their own methods and to contrast them with the methods others are using. But perhaps the most significant benefit of the institutes is their effect upon the hospital pharmacist as an individual.

TABLE 110. Attendance of Chief Pharmacists at Pharmacy Institutes[1]

Number of Times Attended	Percent of Chief Pharmacists Reporting According to Type of Hospitals: Short-Term, Less Than 100 Beds	Short-Term, 100 Beds and Over	Long-Term, All Sizes	All Hospitals
None	59	48	48	49
One	11	24	32	23
Two	10	12	13	12
Three	8	7	2	6
Four	7	3	3	4
Five	2	2	1	2
Six or more	3	4	1	4
Number of hospitals	(204)	(1346)	(303)	(1853)

[1]Institutes on Hospital Pharmacy sponsored by the American Hospital Association or the Catholic Hospital Association in cooperation with the American Society of Hospital Pharmacists and the American Pharmaceutical Association.

Participation in institutes creates within the individual a self-awakening and a keen desire to reevaluate and to improve pharmacy service in his own hospital.

4.2 Value of Institutes

The value chief pharmacists place on institutes as aids in helping them provide better pharmaceutical service is shown in Table 111 (Q 51a). As a group, about 3 out of 4 chief pharmacists find these refresher programs *very valuable or quite valuable.* Only 4 percent find them of *little or no value* and most of these are those who have attended but one institute. The value of institutes increases as the individual participates in more of them. For example, about 88 percent of those participating in four or more find them *very or quite valuable.* Thus, it appears that these refresher programs are well received by hospital pharmacists. They undoubtedly help to overcome the deficiencies which many hospital pharmacists feel existed in their educational and internship or residency programs.

Much of the material presented at institutes is repeated year after year, although an attempt is made to change the approach, the emphasis, and the speakers. Despite this repetition, those who have participated more than once rate the value of the institutes significantly higher than those who have attended only one refresher course. Perhaps the pharmacist who attends his first institute is presented with too many unfamiliar concepts and practices to digest easily. He tends to feel that many of the ideas and procedures offered and discussed do not pertain to his hospital. Then, too, the newcomer is not well acquainted with the rest of the group and tends to feel

TABLE 111. Value of Institutes to Chief Pharmacists in Helping Them to Provide Better Pharmacy Service

Number of Institutes Attended	Value of Institutes (Percent of Chief Pharmacists): Very Valuable	Quite Valuable	Somewhat Valuable	Little or No Value	Number of Chief Pharmacists Reporting
One	41	28	22	9	417
Two	48	31	18	3	217
Three	46	32	19	3	113
Four	68	20	12	—	72
Five	63	25	12	—	33
Six or more	71	18	10	1	70
Average	49	28	19	4	100

922 Chief pharmacists reporting.

isolated. But as he attends more and more refresher programs he builds personal friendships and gradually learns how other pharmacists in hospitals of a size and type similar to his have been able to adapt the ideas presented to improve their pharmacy service. He soon learns that much more of the material than he originally had thought can be applied to the improvement of pharmacy service in his own hospital. As a result of this, his reaction toward the value of the institutes becomes more favorable.

In response to a related question, 22 percent of chief pharmacists feel they are able to keep up *very well* with advances being made in their specialty; 55 percent said they could keep up *fairly well,* while the remainder either did not answer the question or replied that they could not keep up well with the advances (8 percent) (Q 52). While we cannot relate these findings directly to participation in the institutes on hospital pharmacy, it is apparent that these programs and a study of the literature are the principal means by which a practitioner can keep up with advances in the field of hospital pharmacy. The value chief pharmacists who have attended more than one refresher program place on them implies strongly that these programs play a significant role in helping them keep up to date.

More than 9 out of 10 chief pharmacists rated the professional competence of their staff pharmacists as *very good to good* and their ability to carry out their functions as *very well to well* (Q 66 and 66a).

RECOMMENDATIONS

9.10 Institutes on Hospital Pharmacy. It is recommended that the American Society of Hospital Pharmacists increase the scope and depth of the institutes on hospital pharmacy and consider holding (1) two scientific and professional institutes, (2) two professional and administrative institutes, and (3) two specialized institutes annually.

X

Drug service in hospitals without full-time pharmacists

1

INTRODUCTION

Almost 4700 of the approximately 7000 hospitals in the United States lack the services of a full-time pharmacist. In about half of these there is no pharmacist involved in any way with the drug service. In only about 1 in 10 of these hospitals does a pharmacist come to the institution to provide service; others obtain part of their pharmacy service from local community pharmacists but rely heavily on non-pharmacist personnel in the hospital to handle drugs.

It is sometimes overlooked that small hospitals share with large hospitals the role of being the health center of the community, and often its only medical center. Drugs are as important and numerous, as complex and as potentially dangerous regardless of the size of the hospital in which they are used. Thus, in all hospitals, patients are entitled to quality pharmacy service rendered under the direction of a competent, legally qualified pharmacist. This principle has been accepted by the American Hospital Association and the American Society of Hospital Pharmacists. In only a very few hospitals, however, is this principle carried out.

Ideally the pharmacist, whether on a full-time or part-time basis, should be in charge of the total pharmacy service of the hospital, and administratively responsible to an officer of the hospital. Within this framework he should be responsible for the policies and procedures for the requisition, storage, labeling, distribution, compounding, and dispensing of drugs. His responsibilities should also encompass the inspection and control of drugs throughout the hospital, serving as a consultant to the medical and allied staffs on matters pertaining to drugs, and performing his role as a member of the hospital's pharmacy and therapeutics committee. Providing for the safe distribution of drugs 24 hours a day is also part of this responsibility.

In this portion of the study we have tried to determine how drugs are handled in hospitals, what type of personnel perform these functions, what facilities are available, how much money is spent for drugs, and what the administrator's attitude is toward the adequacy of the present service and what changes, if any, he would like to make. The questionnaire upon which this study is based is to be found in Appendix B.

The summary of the sampling data of hospitals without full-time pharmacists is shown in Table 112. This supplements the sampling information presented in Chapter IV and applies specifically to the portion of the study concerning hospitals without full-time pharmacists. These are predominantly hospitals with less than 100 beds. Here the sampling was done at a one-third rate, that is, a questionnaire sent to every third hospital stratified by bed size and geographical region as listed in the 1957 Directory of the American Hospital Association. The sampling error resulting from this procedure is less than 2 percent. The number of returned questionnaires was multipled by 3 to represent the total universe. The response rate for hospitals under 50 beds was 57.42 percent while the rate for hospitals with 50–99 beds was 60.28 percent. In a few tables we have projected the findings to include all hospitals without full-time pharmacists.

TABLE 112. Sampling Data of Hospitals without Full-Time Pharmacists, and Projection Factors

Bed Capacity	Total Hospitals without Full-Time Pharmacists	Number of Hospitals Responding to Questionaire	Percent Response	Projection Factor for Total Hospitals without Full-Time Pharmacist
Short-term				
Under 50	2325	1335[1]	57.42	1.742
50–99	1065	642[1]	60.28	1.659
100–199	270	214	79.26	1.262
200–299	17	17	100.00	1.000
300–399	1	1	100.00	1.000
All short-term	3678	2209	60.06	1.665
Long-term				
All sizes	987	540[1]	54.71	1.828
Total	4665	2749	58.93	1.697

[1]Weighted by factor of 3.

For example, this was done in Table 118 so we could get a better idea of the number of non-pharmacist personnel providing drug service. The factors for projecting the findings are listed in Table 112.

In projecting the figures we assumed that the characteristics of the hospitals not responding to the questionnaire are essentially similar to those which did respond. This is a matter of judgment and is subject to error. There is no exact method to calculate the reliability of this judgment. However, we believe that the assumption is reasonably valid and that the percentage error is not unreasonably great, probably within 10 percent. The purpose of the projections is not to obtain an exact figure but merely to obtain an estimate of how the findings might relate to all hospitals without a full-time pharmacist.

Hospitals with 100 or more beds were sampled at 100 percent and thus there is no sampling error. The response rate from this group of hospitals ranges between about 80 to 100 percent.

The findings indicate that many administrators do wish to make changes to improve their pharmacy service. Others are satisfied with present arrangements. It is evident, however, that a need exists for improved pharmacy service to patients in thousands of American hospitals. We believe that the recommendations made in this report will help to achieve this goal not only in these hospitals but also in nursing homes and other health care institutions not classified as hospitals but where the use of drugs is an important component of patient care.

2

STATUS OF DRUG SERVICE IN HOSPITALS WITHOUT A FULL-TIME PHARMACIST

2.1 Methods of Handling Drugs

Hospitals without a full-time pharmacist use three principal methods of handling drugs. First, a community pharmacist assumes professional responsibility for pharmacy service in the hospital and personally comes to the hospital to actively participate in performing this service. Second, a community pharmacist acts as a supplier of drugs but does not himself come to the hospital to give service; rather, other personnel, principally nurses, function in the hospital to control and distribute drugs. Third, a pharmacist is not involved in the hospital's drug service, which is carried on entirely by other personnel.

The number of hospitals, without the services of a full-time pharmacist, using each of the three principal methods for handling drugs is shown in Table 113 (Q 25S). Here we note that non-pharmacist personnel are responsible for carrying out the various functions of the pharmacy or drug room with no supervision from a registered pharmacist in 9 out of 10 of these hospitals. In 45 percent of the hospitals the drug service is handled entirely by non-pharmacists. In another 45 percent of hospitals the drug service is also handled entirely by non-pharmacist personnel but the hospital maintains an arrangement with a community pharmacy for the compounding of prescriptions and as a source of supply. Only in 9 percent of these hospitals does a community pharmacist come to the hospital to personally supervise the distribution of drugs and to render the personal professional services of a pharmacist. Even in this latter case, however, it is safe to assume that non-pharmacist personnel are involved in drug services because of the relatively small amount of time the community pharmacist is present in the hospital.

Combining the two types of arrangements hospitals have with community pharmacists, however, we find that 54 percent of these short-term and long-term hospitals have a pharmacist involved to some extent in their drug service. Admittedly, the arrangement whereby the community pharmacist never comes to the hospital to supervise or to give personal professonal service within the institution leaves the supervision of the handling of drugs entirely in the hands of non-pharmacists. Nevertheless, one may assume with reason that such an arrangement fosters at least some degree of communication between those in charge of the drug room and the community pharmacist and is beneficial to this extent.

Both short-term and long-term hospitals use the same general methods of handling drugs, and at the same general rate. It is noteworthy, however, that in the smallest hospitals, those with less than 25 beds, one finds the greatest utilization of the personal service of the pharmacist, one in which he personally comes to the hospital to perform this service. This is in particularly sharp contrast to methods used by the 231 short-term hospitals with 100–299 beds found within this group. None of these has an arrangement whereby a pharmacist enters the hospital to give service. This is true also in the larger long-term hospitals, those with 300 beds and over. All of the 200–299 bed short-term hospitals do, however, have some arrangement with a community pharmacy, one not involving responsibility for drug service within the hospital.

It is a well accepted principle that the pharmacy service of a hospital should be under the direction of a professionally competent, legally qualified pharmacist.* In addition, this principle is in agreement with the intent and substance of the laws and regulations embodied in the various state pharmacy practice acts. The pharmacist may serve on a full-time or part-time basis. The findings of this study show that in only about 1 hospital in 10 of this group is this principle

* Suggested Principles of Relationship Between Smaller Hospitals and Part-Time Pharmacists Who Provide Pharmaceutical Services, Approved by the Board of Trustees of the American Hospital Association and the Executive Committee of the American Society of Hospital Pharmacists, February 1959, *Am. J. Hosp. Pharm. 16*:124 (Mar.) 1959.

TABLE 113. Methods Used for Handling Drugs in Hospitals without a Full-Time Pharmacist

Bed Capacity	Number of Hospitals Reporting	Percent of Hospitals Using This Method: Personnel Other Than a Pharmacist	Personnel Other Than a Pharmacist Plus Arrangement with a Community Pharmacy	Local Community Pharmacist Personally Supervises Pharmacy Service at Hospital	Other methods
Short-term					
1–24	483	34	44	18	4
25–49	852	48	42	9	1
50–99	642	50	43	6	1
100–199	214	41	57	0	2
200–29	17	0	100	0	0
All short-term	2208	45	45	9	1
Long-term					
1–24	21	43	29	28	0
25–49	87	21	52	17	10
50–99	189	44	49	7	0
100–199	114	46	54	0	0
200–299	39	54	38	8	0
300–399	21	14	57	0	29
400–499	9	33	67	0	0
500 and over	60	69	26	0	5
All long-term	540	43	47	7	3
Average	100	44	45	9	2

2748 Hospitals reporting.

TABLE 114. Pharmacy Activities Now Provided in Hospitals without a Full-Time Pharmacist and Percent of Administrators Desiring to Have Activities Provided by a Pharmacist

Pharmacy Activities Provided and If Not, Administrator Would Like to Have Service Provided by a Pharmacist	Methods of Handling Drugs and Percent Hospitals Providing Designated Activities: Personnel Other Than Pharmacists — Activity Provided	Personnel Other Than Pharmacists — Want Activity Provided by a Pharmacist	Personnel Other Than Pharmacists Plus Arrangement with Community Pharmacy — Activity Provided	Personnel Other Than Pharmacists Plus Arrangement with Community Pharmacy — Want Activity Provided by a Pharmacist	Arrangement with Community Pharmacist Who Supervises Pharmacy Service — Activity Provided	Arrangement with Community Pharmacist Who Supervises Pharmacy Service — Want Activity Provided by a Pharmacist	All Methods of Handling Drugs — Activity Provided	All Methods of Handling Drugs — Want Activity Provided by a Pharmacist
Control and handling of narcotics	84	3	86	3	65	6	83	3
Purchasing and maintaining drug inventory	81	5	82	4	63	5	80	5
Providing drugs in ready to use form to nursing, operating, and clinic units, etc.	79	4	76	4	55	8	76	4
Inspecting drugs on nursing units for proper storage, deterioration, etc.	67	10	75	6	62	5	71	7
Developing safe procedures for handling drugs	70	8	72	7	59	8	70	8
Working with nursing department in setting up drug stock on nursing units	68	7	69	6	50	6	68	6
Conferring with medical staff on selection of drugs to be stocked in pharmacy	64	11	64	9	59	4	64	9
Maintaining business control procedures and records	55	12	60	9	47	9	57	10
Providing drug information service to medical, nursing, and allied staffs	45	13	50	14	46	10	47	13
Filling prescriptions for inpatients	35	13	25	18	28	10	30	15
Filling prescriptions for discharge and clinic patients	19	14	15	17	13	10	17	15
Compounding or preparing special prescriptions, solutions, and other preparations	10	20	8	24	19	10	10	21
Number of hospitals reporting	(1248)		(1230)		(234)		(2712[1])	

[1]36 Hospitals did not respond to this question.

carried out in practice. This study did not determine the organizational relationship of pharmacists serving hospitals on a part-time basis, that is, whether they are appointed as department heads and are considered a member of the hospital staff reporting to an administrative authority.

2.2 Scope of Service

The scope of drug service available in hospitals which do not have a pharmacist full-time is shown in Table 114. Administrators were asked to indicate whether or not the services listed in the table were now being carried out by the person responsible for drug service in the hospital. In the large majority of cases this person is a non-pharmacist. If these services were not being provided, the administrator was asked whether he would like to have them furnished by a pharmacist. In other words, if the services were being provided, the administrator presumably would not indicate that he would like to have them furnished by a pharmacist. (See question 12 of small hospital questionnaire, Appendix B.)

Narcotics are controlled and handled by non-pharmacists in about 85 percent of hospitals where there is no full-time pharmacist. In only 3 percent of the cases would the administrator want a pharmacist to provide this service. In hospitals where the community pharmacist supervises the pharmacy service, this activity is performed by only 65 percent of the pharmacists. Administrators in 6 percent of these hospitals would like to have the pharmacist assume this responsibility.

Almost the same pattern is evident in answers regarding purchasing and drug inventory. A similar pattern is noted relative to providing drugs in ready to use form to nursing and other patient care units. In hospitals where the pharmacist actually comes to the hospital, 8 percent of administrators would like the pharmacist to perform this service. In hospitals where this activity is carried out by non-pharmacists, 4 percent of administrators would like pharmacists to do it.

Inspection of drugs on nursing units, developing safe procedures for the handling of drugs, and working with the nursing department to establish drug stock on patient units are performed by non-pharmacists in somewhat over two-thirds of the hospitals. In hospitals where these services are not now provided, between 6 and 10 percent of administrators would like pharmacists to provide them. Again, we note that in hospitals to which the pharmacist personally comes, the percentage of pharmacists performing these three services is appreciably lower. Administrators in from 5 to 8 percent of these hospitals want their pharmacist to provide these services.

In about two-thirds of hospitals in which non-pharmacists are in charge of drugs they also confer with the medical staff on the selection of drugs to be stocked in the pharmacy or drug room. Administrators would like pharmacists to provide this service in about 10 percent of the hospitals where this service is not now available. Pharmacists who come to the hospital are less active in this area since only 59 percent perform this function, while 4 percent of administrators wish they would.

Business records and control procedures are maintained by non-pharmacists respectively in 55 and 60 percent of hospitals which do not have a pharmacist coming to the hospital. About 10 percent of administrators would like to have pharmacists assume this responsibility. Again, a smaller percentage of pharmacists coming to the hospital are recorded as providing this service, although 9 percent of administrators want them to.

TABLE 115. Utilization of Nurses to Carry Out Pharmacy Activities in Hospitals without Pharmacists

Bed Capacity	Number of Hospitals Reporting	Full-Time Nurses					Part-Time Nurses				
		Number of Nurses	Number of Hospitals with				Number of Nurses	Number of Hospitals with			
			1	2	3 or More	None		1	2	3 or More	None
Short-term											
1–24	483	24	12	0	3	468	588	201	27	87	168
25–49	852	63	51	0	3	798	1080	402	72	141	237
50–99	642	99	75	3	6	558	774	294	96	78	174
100–199	214	72	66	3	0	135	318	63	42	42	57
200–299	17	15	15	0	0	2	30	11	3	3	0
All short-term	2208	273	219	6	12	1961	2790	971	240	351	646
Long-term											
1–24	21	0	0	0	0	21	27	6	6	3	6
25–49	87	12	3	0	3	81	78	36	12	6	3
50–99	189	15	9	3	0	177	213	108	15	21	45
100–199	114	12	12	0	0	102	132	69	12	12	21
200–299	39	12	6	3	0	30	27	15	0	3	21
300–399	21	3	3	0	0	18	9	3	3	0	15
400–499	9	3	3	0	0	6	15	0	0	3	6
500 and over	60	12	6	3	0	51	33	9	3	3	45
All long-term	540	69	42	9	3	486	534	245	51	51	192
Totals	2748	342	261	15	15	2447	3324	1217	291	402	828

Drug information service is provided by non-pharmacists in between 45 to 50 percent of hospitals in this group. Between 13 and 14 percent of administrators would like to have pharmacists perform this service. Forty-six percent of pharmacists coming to the hospital perform this function; 10 percent of administrators want these pharmacists to supply this service.

In a large majority of these hospitals prescriptions are not filled for discharge or clinic patients, nor are prescriptions compounded nor special solutions or other preparations made for inpatients. In hospitals with the drug service under non-pharmacists, respectively 14 and 20 percent of administrators would like to have pharmacists provide this service. It is surprising to note, in hospitals where a community pharmacist supervises the pharmacy service that these services are provided in a smaller percentage of hospitals than when non-pharmacists are in charge of the drug service. Not only did administrators answer that the services are not provided, but fewer wanted these services provided by a pharmacist than in those hospitals where the drug service is under a non-pharmacist.

In some hospitals where certain pharmacy activities are not now being provided many administrators would like to have them provided by a pharmacist. As shown in Table 114, about 10 to 20 percent of administrators would like to have pharmacists confer with the medical staff on selection of drugs, maintain business records, provide drug information, fill prescriptions for in- and outpatients, and do compounding. These and related responses indicate the awareness some administrators have of the services pharmacists could and should provide for hospitals. These are important considerations in predicting future manpower needs in hospital pharmacy.

The responses in Table 114 indicate that the widest scope of drug service, as measured by the activities enumerated, is provided in hospitals where a non-pharmacist provides the service. A slightly narrower scope of service is given in hospitals where non-pharmacists are in charge of the drug service but have some type of an arrangement with the local community pharmacist. The narrowest scope of service is provided in those hospitals to which the local community pharmacist comes to supervise the drug service. The scope of service in these latter hospitals is significantly more narrow than in the hospitals with the other two methods of providing drug service. Only in the activity of compounding or preparing special prescriptions or other preparations does service by the community pharmacist show up well in contrast to the other two methods.

These findings are surprising, and difficult to interpret. The scope of service provided by the community pharmacist may, in fact, be as limited as the administrator believes it is. Factors not brought out in this study may cause it. Or the administrator may not be aware of the scope of service offered by the community pharmacist. It appears unlikely, however, that responses relating to services offered by the community pharmacist would be significantly different if there were not a basic reason for it. These reasons may be related to the limited time community pharmacists spend in the hospital, their concept of the role of the pharmacist in the hospital, and other factors. Also important is the fact that many of the hospitals personally served by community pharmacists are very small, with less than 25 beds. While it is not important that the community pharmacist always personally perform each of the services mentioned, he should see that they are provided properly by someone. And evidently he has not done this to the extent that non-pharmacist personnel in hospitals of similar size have.

There is an evident need for a better understanding by community pharmacists of their duties and responsibilities when they provide pharmaceutical service on a part-time basis to hospitals. The profession should take steps to further this understanding. This may be done through lectures or orientation courses in hospital pharmacy at the undergraduate level in the colleges of pharmacy, through lectures and seminars at meetings of local, state, regional and national pharmaceutical associations, and by wider dissemination of the *Suggested Principles of Relationship Between Smaller Hospitals and Part-Time Pharmacists Who Provide Pharmaceutical Services*, the latter approved by the American Hospital Association and the American Society of Hospital Pharmacists. The resource handbook* for community pharmacists and administrators of smaller hospitals prepared by Berman and Zugich is an excellent source of information on this subject and should be studied by all community pharmacists serving hospitals.

3

PERSONNEL

3.1 Number and Type of Personnel Assigned to Drug Service

A total of 4758 personnel other than pharmacists are performing pharmaceutical duties in 2748 hospitals which do not employ registered pharmacists. This total is made up of 543 full-time and 4215 part-time personnel assigned to the pharmacy or drug room. The extent of utilization of nurses in hospital drug rooms is shown in Table 115; utilization of technicians, aides and other personnel is included in Table 116; the total number of personnel is shown in Table 117; the percentage utilization of nurses and nonprofessional personnel in supplying drug services and the numbers of these personnel projected to all hospitals without full-time pharmacists are shown in Table 118.

* Berman, A. and Zugich, J. J.: *Pharmacy Service in Smaller Hospitals*, published by the College of Pharmacy of the University of Michigan, Ann Arbor, Mich., 1958.

TABLE 116. Utilization of Technicians, Aides, Helpers, and Other Personnel in Hospitals without Pharmacists

Bed Capacity	Number of Hospitals Reporting	Full-Time Technicians, Aides, and Helpers					Part-Time Technicians, Aides, and Helpers				
		Number of Personnel	Number of Hospitals with				Number of Personnel	Number of Hospitals with			
			1	2	3 or More	None		1	2	3 or More	None
Short-term											
1–24	483	6	6	0	0	477	123	114	0	3	366
25–49	852	18	18	0	0	834	294	240	18	6	588
50–99	642	48	24	3	6	609	186	156	9	3	474
100–199	214	60	36	6	3	159	84	48	9	6	141
200–299	17	21	9	6	0	2	9	3	3	0	11
All short-term	2208	153	93	15	9	2091	696	561	39	18	1590
Long-term											
1–24	21	0	0	0	0	21	3	3	0	0	18
25–49	87	3	3	0	0	84	15	15	0	0	72
50–99	189	0	0	0	0	189	54	45	0	3	141
100–199	114	6	0	3	0	111	51	45	3	0	66
200–299	39	0	0	0	0	39	15	9	3	0	27
300–399	21	9	3	3	0	15	18	18	0	0	3
400–499	9	3	3	0	0	6	0	0	0	0	9
500 and over	60	15	15	0	0	45	51	45	3	0	12
All long-term	540	36	24	6	0	510	207	180	9	3	348
Totals	2748	189	117	21	9	2601	903	741	48	21	1938

Nurses comprise the largest group of hospital personnel assigned to the drug room. There are 342 nurses assigned full-time and 3324 assigned part-time to this activity (Table 115). Two hundred nineteen hospitals assign a full-time nurse; a few hospitals assign more than one nurse; however, about 700 hospitals assign two or more nurses on a part-time basis. In general, hospitals tend to utilize one or more nurses on a part-time basis for their drug service. In many cases a nonprofessional worker assists the nurse in this area.

The extent of utilization of full-time and part-time technicians, aides, helpers, and other personnel in the drug room of hospitals without pharmacists is shown in Table 116. Somewhat over half as many nonprofessional personnel as nurses are employed full-time in hospital drug rooms; about one-fourth as many are employed on a part-time basis. A large percentage of these hospitals do not have any nonprofessional personnel assigned to the drug room.

The general staffing pattern of personnel assigned to carry out pharmacy activities in hospitals which do

TABLE 117. Total Number of Personnel Assigned to Carry Out Pharmacy Activities in Hospitals Which Do Not Have a Registered Pharmacist

Bed Capacity	Full-Time Personnel				Part-Time Personnel				Number of Hospitals
	Nurses	Helpers, Technicians or Aides	Other	Total	Nurses	Helpers, Technicians or Aides	Other	Total	
Short-term									
1–24	24	6	0	30	588	48	75	711	483
25–49	63	18	12	93	1080	147	135	1362	852
50–99	99	48	0	147	774	123	63	960	642
100–199	72	60	0	132	318	81	3	402	214
200–299	15	21	0	36	30	9	0	39	17
All short-term	273	153	12	438	2790	408	276	3474	2208
Long-term									
1–24	0	0	0	0	27	0	3	30	21
25–49	12	3	0	15	78	3	12	93	87
50–99	15	0	0	15	213	30	24	267	189
100–199	12	6	0	18	132	33	18	183	114
200–299	12	0	0	12	27	15	0	42	39
300–399	3	9	0	12	9	9	9	27	21
400–499	3	3	0	6	15	0	0	15	9
500 and over	12	15	0	27	33	21	30	84	60
All long-term	69	36	0	105	534	111	96	741	540
Total	342	189	12	543	3324	519	372	4215	2748

TABLE 118. Utilization of Nurses and Nonprofessional Personnel in Supplying Drug Services, Projected for All Hospitals without Full-Time Pharmacists

Type of Employees	Long-Term Hospitals		Short-Term Hospitals		All Hospitals	
	Number of Employees	Percent	Number of Employees	Percent	Number of Employees	Percent
Full-time nurses	126	8.2	455	7.0	581	7.2
Part-time nurses	976	63.1	4648	71.3	5624	69.9
Full-time helpers	66	4.2	255	3.9	321	3.9
Part-time helpers	378	24.5	1160	17.8	1538	19.0
Total	1546	100.	6518	100.	8064	100.

not have a registered pharmacist is shown in Table 117. In short-term hospitals with 25–49 beds, about 1 in 10 has a full-time person assigned to the drug room; in addition, an average of about 1.6 part-time workers is utilized. About 1 in 5 hospitals with 50–99 beds has a full-time person; in addition these hospitals have about 1.5 individuals assigned on a part-time basis. Over 6 out of 10 hospitals with 100–199 beds use individuals full-time; in addition, about 2 part-time personnel per hospital are assigned to the drug room. The 200–299 bed hospitals use more than 2 full-time and more than 2 part-time personnel in their drug room.

In long-term hospitals with less than 25 beds, an average of about 1.3 personnel are assigned part-time. In the 25–49 bed category about 1 in 6 employs a full-time person while an average of more than one part-time personnel is assigned to the drug room. Less than 1 in 10 long-term hospitals with 50–99 beds has a full-time person, while employing an average of 1.4 part-time personnel. Over 1 in 6 long-term hospitals with 100–199 beds utilizes a full-time and about 1.6 part-time personnel. Between 1 in 2 and 1 in 3 long-term hospitals with more than 200 beds employ a full-time person in their drug room; in addition they utilize one or more part-time personnel.

The relative utilization of nurses and nonprofessional personnel in supplying drug services is shown in Table 118. About 77 percent of the personnel carrying out pharmacy activities in these hospitals are nurses. Almost 9 out of 10 nurses who work in the drug room are assigned on a part-time basis. About twice as many nurses as helpers are utilized full-time. In general, long-term hopsitals tend to utilize full-time nurses and full-time helpers slightly more than do short-term hospitals.

The estimated number of personnel supplying drug services to hospitals without full-time pharmacists is shown also in Table 118. Here we note that about 8000 people are engaged in supplying drug services in the 4665 hospitals without full-time pharmacists. Over 6000 nurses are thus engaged, 581 on a full-time basis and 5624 part-time. Thus, 3 out of 4 personnel engaged in providing drug services in these hospitals are nurses (Figure 59).

One may conclude from these findings that there is a need for additional pharmacists, both full-time and part-time, to replace some of the more than 8000 personnel now assigned pharmacy functions. We believe that a more detailed study of the staffing pattern related to professional needs and services would indicate that many of the hospitals with full-time personnel assigned to pharmacy duties could justify the employment of a pharmacist full-time. It is interesting to note that in these hospitals there are approximately as many full-time and part-time personnel assigned to pharmacy as in comparable size hospitals which employ pharmacists (Table 18). We are also of the opinion that a study of all costs, when related to savings and additional services, would indicate that hospitals would not spend appreciably more, if as much, on their total pharmacy service than they are now spending.

Further, those hospitals in which the quantitative demands for pharmacy service are too low to justify the employment of a pharmacist full-time should engage a pharmacist on a part-time basis. In seeking a part-time pharmacist administrators should consider the possibilities of working out an arrangement with another hospital or with a local community pharmacy for the part-time services of a pharmacist. Nor should the possibilities of employing a woman pharmacist on a part-time basis be overlooked. Hospital pharmacy has a high percentage of women practitioners who marry and leave full-time practice. Undoubtedly many of these well-trained, experienced hospital pharmacists would be able and willing to accept a part-time appointment in a hospital. During recent years the percentage of women enrolling

FIGURE 59. Proportion of Nurses and Nonprofessional Personnel Supplying Drug Service to Small Hospitals without Pharmacists

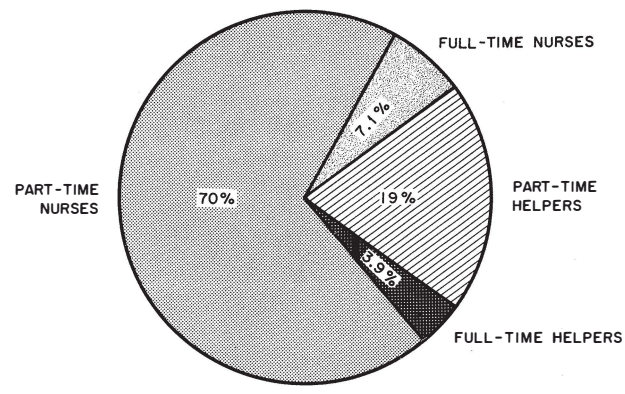


TABLE 119. Distribution of Hours Worked per Week by Part-Time Non-Pharmacist Personnel and Community Pharmacists in Hospitals without a Full-Time Pharmacist

Number of Hours Worked per Week	Distribution of Hours Worked per Week (Percent of Hospitals Reporting)	
	Part-Time Non-Pharmacist Personnel	Community Pharmacist Supervising Pharmacy Activities
Less than 5	32	72
5–9	29	20
10–14	19	3
15–19	8	4
20–29	8	1
30 or more	4	—
Total number of hospitals reporting	(2121[1])	(234)

[1] Excludes 393 hospitals that have only full-time non-pharmacist employees.

in colleges of pharmacy has been increasing steadily. Thus, it is highly probable that married women pharmacists will soon become an important manpower resource which could be utilized effectively in small hospitals.

The continuing shortage of nurses makes it highly desirable that as many as possible of this group be freed from pharmacy functions to devote their abilities to activities concerned with direct patient care in the area of their specialized training. Our study shows that close to 6000 nurses are assigned part-time or full-time to pharmacy activities, including those assigned to the pharmacy in hospitals with full-time pharmacists. This represents a significant number of nurses, most of whom could be better utilized in other areas of the hospital.

3.2 Number of Hours Part-Time Personnel Spend in Drug Room

The number of hours per week spent by part-time non-pharmacist personnel and by community pharmacists in the drug room or pharmacy is shown in Table 119. About one-third of non-pharmacist personnel spend less than 5 hours a week; about 60 percent spend less than 10 hours per week. About 1 in 4 spends 10 to 20 hours weekly, while 12 percent spend 20 or more hours a week. In interpreting this data, one must consider that some hospitals employ both full-time and part-time personnel in their drug room and some employ more than one full-time and more than one part-time person.

Almost 3 out of 4 community pharmacists spend less than 5 hours a week in supervising the pharmacy activity in hospitals they serve; 1 in 5 spends 5 to 9 hours a week, while 7 percent spend 10 or more hours a week at the hospital. We do not know the amount of time spent by non-pharmacists in supplying supplementary drug service in these hospitals. Nor do we know the amount of time the administrator spends in the procurement of drugs, interviewing medical service representatives, and in other pharmacy activities, such as financial and inventory control, narcotic control, etc., which he does not always delegate to the non-pharmacist personnel responsible for the drug room.

4

FACILITIES

4.1 Total Floor Space

The total floor space in square feet devoted to pharmacy activities in hospitals without a full-time phar-

TABLE 120. Total Floor Space of Pharmacy or Drug Room in Hospitals without a Pharmacist

Bed Capacity	Percent of Hospitals Reporting the Amount of Pharmacy or Drug Room Floor Space									
	Area in Square Feet								No Response	Total
	1–24	25–49	50–99	100–199	200–299	300–499	500 or Over	None		
Short-term										
1–24	16	13	12	12	7	2	2	14	22	100
25–49	7	9	21	25	8	4	4	4	18	100
50–99	5	4	14	34	18	6	6	3	10	100
100–199	1	3	3	28	21	16	18	0	10	100
200–299	0	11	0	34	11	11	22	0	11	100
All short-term	8	8	15	25	12	6	5	6	15	100
Long-term										
1–24	29	0	29	14	0	0	14	14	0	100
25–49	17	21	10	18	0	0	3	10	21	100
50–99	13	14	25	21	5	3	0	3	16	100
100–199	3	5	8	53	8	10	5	0	8	100
200–299	8	8	15	23	15	15	0	8	8	100
300–399	0	14	14	14	14	44	0	0	0	100
400–499	0	34	0	0	0	33	0	0	33	100
500 and over	0	0	0	20	15	40	25	0	0	100
All long-term	9	11	15	26	7	11	5	4	12	100
Average	8	9	15	25	11	7	5	5	15	100

macist is shown in Table 120 (Q 7aS). Thus, 8 percent of short-term hospitals have less than 25 square feet and an equal number allot less than 50 square feet of space to drug service. This space is equivalent to a room measuring 4 feet by 6 feet; or one measuring 7 feet by 7 feet.

Among the short-term hospitals with less than 25 beds, the most prevalent amount of floor space devoted to drugs is less than 25 square feet. As shown by Table 120, the mode of all other short-term hospitals up to 300 beds is 100–199 square feet for their drug room. A similar, but less exact, pattern is noted in the long-term hospitals, indicating that 100–199 square feet is a common size for a drug service area. Approximately 5 percent of hospitals without a full-time pharmacist reported no designated space or area called a pharmacy or drug room. These hospitals were primarily those with less than 50 beds. There was also a high percentage of no response to this question, particularly from those hospitals with less than 50 beds.

4.2 Comparison with Hospitals with Full-Time Pharmacists

The amount of floor space devoted to pharmacy activities in hospitals without a pharmacist is less than half of that found in hospitals of similar size with pharmacists, according to Table 121. The median area devoted to pharmacy service in the 200–299 bed hospitals where no full-time pharmacist is utilized is only about one-fourth as large as in those hospitals with a full-time pharmacist—200 in contrast to about 800 square feet. There are relatively small differences in the median area for drug service existing in the three groups of hospitals without pharmacists, ranging from 50–299 beds in size.

The median area devoted to a drug room in long-term hospitals is roughly 25 to 50 percent smaller than in short-term hospitals without a pharmacist. There is relatively little difference in the median area in long-term hospitals below 100 beds. Long-term hospitals with from 100–199 beds to 400–499 beds differ but little in their median area of space allotted to drugs.

A comparison of square feet of floor space per bed allotted to drug rooms in these hospitals is also shown in Table 121. This is contrasted to the findings in hospitals with full-time pharmacists, taken from Table 12, and is found to be considerably smaller. From these findings it is evident that many drug rooms in hospitals without pharmacists are little more than closets, small ones at that. The size of the drug room probably bears a relationship to the scope of drug service offered in these hospitals. As shown in Figure 28 and Table 53 (Chapter VII), for example, the scope of service in hospitals with full-time pharmacists is much more extensive than that shown in Table 114, which is concerned primarily with management functions plus the dispensing of prefabricated drugs with few hospitals providing compounding or preparation of special medications for patients.

On the other hand, as shown in Table 120, some hospitals in this group do have a reasonable amount of space for drug room activities, space which compares favorably with that allotted to the pharmacy in hospitals with a full-time pharmacist. Thus, about 30 percent of the 50–99 bed hospitals have at least as much floor space—205 square feet—as recommended by the Public Health Service for 50 bed hospitals.* About a third of hospitals with 100–199 beds, however, have less than the 205 square feet of floor space recommended by the Public Health Service for a 50 bed hospital. In over half of the 2748 hospitals there is some arrangement with a community pharmacist who supplies certain medications directly to the patient. This may be a significant contributing factor in the amount of space devoted to the drug room.

Because of their generally more restricted use of drugs, long-term hospitals tend to allot comparatively less total space to drugs than do short-term hospitals without full-time pharmacists.

There is an apparent need for more adequate facilities for drug service in hospitals without full-time pharmacists. It would be worthwhile to examine the facilities for handling drugs in a number of small hospitals and to determine these needs more precisely.

* Milne, A. M. and Taylor, W. R.: *Suggested Plans for Hospital Pharmacies, 50, 100 and 200 Bed General Hospitals, Bull. Am. Soc. Hosp. Pharm.* 7:122 (May–June) 1950.

TABLE 121. Comparison of Floor Space of Pharmacy in Hospitals with and without Pharmacists

Bed Capacity	Median Area in Square Feet		Square Feet per Bed	
	Hospitals without Pharmacists	Hospitals with Pharmacists	Hospitals without Pharmacists	Hospitals with Pharmacists
Short-term				
1–24	63	350	5.25	13.0
25–49	107		2.90	
50–99	159	338	2.12	6.5
100–199	205	449	1.37	4.0
200–299	200	797	0.80	3.9
Long-term				
1–24	75	—	6.25	—
25–49	46	—	1.22	—
50–99	77	—	1.03	—
100–199	158	—	1.05	—
200–299	155	—	0.62	—
300–399	250	—	0.71	—
400–499	175	—	0.39	—
500 and over	337	—	0.67	—

TABLE 122. Expenditure for Drugs in Hospitals without Full-Time Pharmacists 1957

Bed Capacity	Number of Hospitals Reporting Expenditure[1]	Annual Expenditure			Number of Hospitals Reporting No Expenditure
		Median	Average Deviation	Range	
Short-term					
1–24	468	$ 6,810	$ 5,005	$ 1,500–45,000	15
25–49	849	11,605	7,005	1,500–50,000 or more	3
50–99	639	18,971	7,813	1,500–50,000 or more	3
100–199	20	35,333	10,043	7,500–50,000 or more	0
200–299	17	Over 50,000	835	45,000–50,000 or more	0
Long-term					
1–24	21	$ 3,000	$ 2,125	$ 1,500–7,500	6
25–49	87	3,859	1,875	1,500–15,000	0
50–99	189	5,385	3,888	1,500–15,000	0
100–199	114	11,764	5,235	1,500–25,000	0
200–299	33	8,750	8,278	1,500–35,000	6
300–399	21	20,000	6,250	7,500–25,000	0
400–499	9	25,000	6,667	15,000–35,000	0
500 and over	60	32,500	12,794	15,000–50,000 or more	0

[1]25 Percent of total sample did not answer this question.

5

DRUG EXPENDITURE AND INVENTORY

5.1 Expenditure for Drugs

Annual expenditures for drugs in hospitals without a full-time pharmacist are shown in Table 122 (Q 9S). Here we see the median annual expenditure, the average deviation from the median, and the range of expenditures. For example, the median annual expenditure for 849 short-term hospitals with 25–49 beds is $11,605; the average deviation from the median is $7005; and the range is from $1500 to $50,000 or more. Three of these hospitals reported no expenditure for drugs.

Expenditures for drugs among hospitals of different size cover a wide range. For example, the three groups of short-term hospitals with less than 100 beds show a range of from $1500 to $50,000 in two groups, and up to $45,000 in the smallest size. A similar broad range of expenditures for drugs is noted in Table 42 (Chapter VI) relative to expenditures in hospitals employing a full-time pharmacist.

These hospitals without a full-time pharmacist report a lower median expenditure for drugs than do hospitals with a full-time pharmacist, as shown in Table 41 (Chapter VI). We believe the main reason for this is related to the fact that in over half of these 2748 hospitals there is some arrangement with a community pharmacist who supplies certain medications directly to the patient in such a manner that the cost of the medication is not recorded in the hospital's accounting system as a drug expenditure. Other factors that may have a significant influence on expenditures for drugs are the absence of an outpatient pharmacy in these hospitals, in addition to their not providing pharmacy service to hospital employees. In addition, intravenous solutions are normally handled in the pharmacy in hospitals with a full-time pharmacist, while in hospitals without a pharmacist they are normally handled in the hospital storeroom or in central supply.

Long-term hospitals in this group have a significantly lower expenditure for drugs than do long-term hospitals employing a pharmacist full-time. In the latter hospitals the median annual expenditure for all sizes of long-term hospitals is almost $54,000 as noted in Table 41 (Chapter VI). Here again we believe that the type of arrangement which over half of these hospitals have with a community pharmacist, Table 113, plus the types of patients treated in this group of long-term hospitals result in lower expenditure for drugs.

5.2 Annual Drug Inventory

The annual inventory of drugs in hospitals without a full-time pharmacist is shown in Table 123. This figure is broken down to yield the median dollar value of the drug inventory, the average deviation from this median, and the range. The median inventory and average deviation from the median are both lower in this group of short-term and long-term hospitals than are the corresponding findings in hospitals employing a full-time pharmacist. The median inventory increases in a linear fashion with the size of the short-term hospitals, although the increase is somewhat irregular in long-term hospitals.

The range of dollar inventory values for the short-term hospitals in this group with less than 200 beds is expressed as $1500 to $15,000 or more. Only about 1 percent of hospitals reported an inventory of more than $15,000 and most of these are found among the

TABLE 123. Inventory for Drugs in Hospitals without Full-Time Pharmacists 1957

Bed Capacity	Number of Hospitals Reporting Inventory	Annual Inventory			Number of Hospitals Reporting No Inventory[1]
		Median	Average Deviation	Range	
Short-term					
1–24	468	$ 2,531	$2255	$1,500–15,000 or more	15
25–49	846	4,052	2332	1,500–15,000 or more	6
50–99	636	6,039	3024	1,500–15,000 or more	6
100–199	204	9,250	3508	1,500–15,000 or more	0
200–299	17	Over 15,000	1500	8,500–15,000 or more	0
Long-term					
1–24	15	$ 1,500	—	$1,500	6
25–49	75	2,400	$1844	1,500–6,000	12
50–99	165	2,312	1635	1,500–12,500	24
100–199	108	4,200	2625	1,500–15,000 or more	6
200–299	33	5,000	1750	1,500–8,500	3
300–399	21	4,500	3200	1,500–12,500	0
400–499	9	12,500	3250	8,500–15,000 or more	0
500 and over	60	11,562	2706	4,000–15,000 or more	0

[1]20 Percent of total sample did not answer this question.

few hospitals with 200–299 beds whose median inventory is over $15,000.

We believe that the lower inventory values in hospitals without a full-time pharmacist are due in great part to the arrangement over half of these hospitals have with community pharmacies to obtain drugs. Under such an arrangement, the community pharmacy keeps part of the drug inventory for the hospital. For example, if special medications are ordered from the community pharmacy for the patient, the hospital does not purchase a bulk quantity and have any remaining in inventory. We interpret the 20 percent no response rate to this question as related more to difficulties in estimating the value of the drug inventory by a lay administrator than to any other reason.

5.3 Expenditure and Inventory per Bed, Admission, and Patient Day

The relationship of drug expenditure and inventory per hospital bed, admission and patient day is shown in Tables 124 and 125. These tables are approximations based on data found in Tables 122 and 123 and Figure 60. To approximate the expenditure and inventory per bed, the midpoint of the bed capacity range, that is 50 to 99 beds became 75 beds, was divided into the median annual expenditure. The number of inpatient admissions was obtained in this survey. By an indirect method, the median annual expenditure and its deviation were correlated with admissions in each bed category (Table 122).

TABLE 124. Relationship of Median Drug Expenditure per Hospital Bed, Admission, and Patient Day

Bed Capacity	Median Annual Expenditure in Dollars per		
	Bed	Admission	Patient Day
Short-term			
1–24	$567.50	$14.78	$2.90
25–49	313.65	8.87	1.56
50–99	252.95	7.49	1.19
100–199	235.55	5.22	0.75
200–299	>200.00	>5.00	>0.65
Long-term			
1–24	$250.00	—	—
25–49	104.24	—	—
50–99	72.80	—	—
100–199	78.43	—	—
200–299	35.00	—	—
300–399	57.14	—	—
400–499	55.56	—	—
500 and over	>65.00	—	—

Source of data found in Table 122 and Hospitals, Guide Issue, Table 2, pg. 356 (Aug. 1) 1957.

TABLE 125. Relationship of Median Drug Inventory per Hospital Bed, Admission, and Patient Day

Bed Capacity	Median Annual Inventory in Dollars per		
	Bed	Admission	Patient Day
Short-term			
1–24	$210.92	$5.06	$1.00
25–49	109.51	2.70	0.35
50–99	80.52	2.02	0.32
100–199	61.67	1.32	0.19
200–299	>60.00	>1.50	>0.19
Long-term			
1–24	$125.00	—	—
25–49	64.86	—	—
50–99	30.83	—	—
100–199	28.00	—	—
200–299	20.00	—	—
300–399	12.86	—	—
400–499	27.78	—	—
500 and over	>23.12	—	—

Source of data found in Table 123 and Hospitals, Guide Issue, Table 2, pg. 356 (Aug. 1) 1957.

When we compare expenditure and inventory in hospitals with and those without a full-time pharmacist, we find in each bed size that hospitals without a full-time pharmacist spend less for drugs and maintain a lower inventory than do hospitals with full-time pharmacists. This may be seen by comparing the findings relative to expenditures in Table 124 with those in Table 45 (Chapter VI) and in Table 125 with those in Table 48 (Chapter VI). For example, contrasting the expenditure for 50–99 bed hospitals with and without a full-time pharmacist we find the expenditure per bed is $479.54 in contrast to $252.95; expenditure per admission is $13.15 versus $7.49; and expenditure per patient day is $2.09 versus $1.19. The similar relationship between inventory in these two groups of hospitals with 50–99 beds is as follows: inventory per bed $150.26 in contrast to $80.52 in hospitals without full-time pharmacists; inventory per admission $4.12 versus $2.02; and inventory per patient day $0.65 versus $0.32.

Thus, it is evident that there are factors operating in certain small, short-term hospitals which make their use of drugs much greater than others. These small hospitals tend to employ full-time pharmacists. We note, for example, in Table 16 (Chapter V) that 231 hospitals with 50–99 beds employ a pharmacist full-time. These hospitals also spend more for drugs than do the same size hospitals without a pharmacist and this difference is significant. One may postulate that the different level of expenditure for drugs may be caused by the presence or absence of outpatient prescription service, the prescribing patterns of the medical staffs, the medication needs of patients, the accounting practices of hospitals which have an arrangement with local community pharmacies, and other factors. From this finding one may conclude that there is, in general, a fairly direct relationship between the amount of money a hospital spends for drugs and whether or not they employ a full-time pharmacist.

We have determined that about 2 out of 3 hospitals with 50–99 beds and about 8 out of 10 hospitals with 100–199 beds, but without full-time pharmacists, spend as much for drugs as some corresponding hospitals with full-time pharmacists. This is shown in Figure 60 where the median annual expenditure and the average deviation of these hospitals with and without full-time pharmacists are plotted.

In the 50–99 bed hospitals about 37 percent, or slightly over one-third of the hospitals with full-time pharmacists, spend as much for drugs as some hospitals without a pharmacist. Correspondingly, since the average deviation embraces about two-thirds of the sample, almost two-thirds of 50–99 bed hospitals without a full-time pharmacist spend as much for drugs as some hospitals with full-time pharmacists.

A similar relationship is observed in the 100–199 bed hospitals with and without full-time pharmacists. Here we observe further, however, that about 15 percent of short-term hospitals with pharmacists spend even less for drugs than hospitals without a pharmacist. Thus, if it is true that the amount of money spent by hospitals for drugs has an important bearing on their decision to employ a full-time pharmacist, about two-thirds of the 642 short-term 50–99 bed hospitals reporting could seriously consider the appointment of a full-time pharmacist. And close to 90 percent of the 214 hospitals with 100–199 beds could make the same decision.

As a corollary to drug expenditure, the median drug inventory and average deviation in short-term hospitals of 50–99 and 100–199 beds with and without pharmacists were investigated. The results are shown in Figure 60. The median drug inventory in hospitals without full-time pharmacists is lower than that in hospitals with pharmacists. Because of the wide average deviation, 45 percent of short-term hospitals of 50–99 and 100–199 beds with pharmacists maintain as high an inventory of drugs as those comparable hospitals without pharmacists. Or to put it

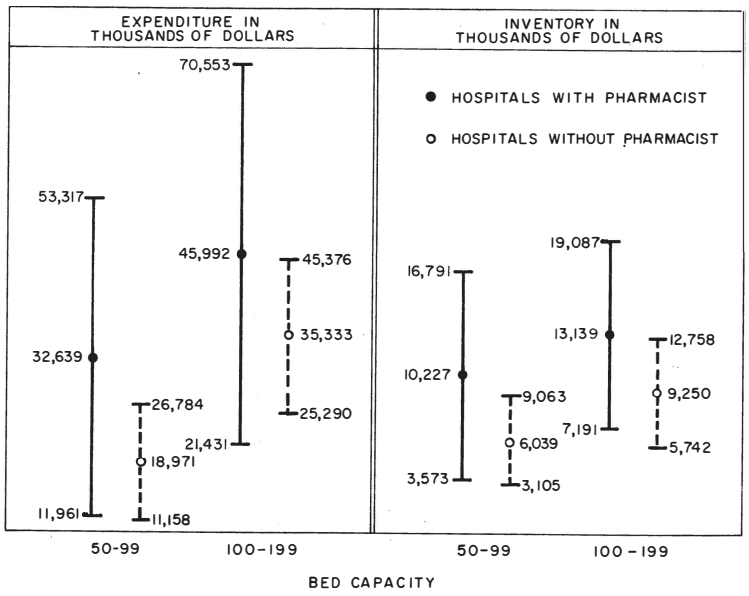


FIGURE 60. Comparison of Median Drug Expenditure and Inventory and Average Deviations in Short-Term Hospitals with and without Pharmacists, 50–99 and 100–199 Bed Size

TABLE 126. Type of Formulary or Drug List in Hospitals without Full-Time Pharmacists

Bed Capacity	Number of Hospitals Reporting	Percent of Hospitals with Formulary or Drug List				Percent of Hospitals with Pharmacy and Therapeutics Committee
		Developed Own Formulary	Adopted Another Hospital's Formulary	Drug List	Total	
Short-term						
1–24	483	1<	1<	34	35	4
25–49	852	10	2	42	54	18
50–99	642	13	1	50	64	37
100–199	214	23	2	46	71	49
200–299	17	22	0	78	100	56
All short-term	2208	10	1	44	55	24
Long-term						
1–24	21	0	0	43	43	0
25–49	87	0	3	28	31	3
50–99	189	1	0	29	30	13
100–199	114	10	3	37	50	8
200–299	39	8	0	23	31	15
300–399	21	29	14	57	100	14
400–499	9	0	0	0	0	33
500 and over	60	35	5	25	65	40
All long-term	540	8	2	31	41	13
Average	100	10	1	41	52	22

2748 Total hospitals reporting.

another way, about two-thirds of the 50–99 bed hospitals without pharmacists maintain an inventory of drugs equal in value to some hospitals with full-time pharmacists. Only 10 percent of short-term hospitals without pharmacists in the 100–199 bed size do not have as high an inventory as the lowest inventory in those hospitals with pharmacists. The presence of a formulary is another possible factor influencing expenditure and inventory of drugs in hospitals without a pharmacist. Since 52 percent of 2748 hospitals (Table 127) have a formulary and since the data in Chapter VI substantiates the formulary's influence on expenditure and inventory, there is no reason to assume that the formulary status is not a factor in this group of hospitals.

This evidence indicates that further study of related factors involved in the decision to employ a pharmacist would probably result in the addition of full-time pharmacists to the staffs of hundreds of small hospitals.

6

PHARMACY AND THERAPEUTICS COMMITTEES AND FORMULARIES

6.1 Status of Committees and Formularies

The percent of hospitals without a full-time pharmacist having a pharmacy and therapeutics committee, and a formulary or drug list is shown in Table 126 (Q 10S, 11S). These two portions of Table 126 must be read independently of each other and only the bed capacity and number of hospitals reporting are common denominators. It must also be remembered that this survey was done before the *American Hospital Formulary Service* became available. About 1 out of 4 short-term hospitals in this group has a pharmacy and therapeutics committee, while over 1 out of 2 has either a drug list or formulary. Thus, many hospitals without a committee employ a drug list or a formulary.

About 50 percent of short-term hospitals with 100 or more beds have a pharmacy and therapeutics committee. About 23 percent of these 642 hospitals have developed their own formulary, while twice as many use a drug list.

Among the short-term hospitals with less than 100 beds the percentage having such committees decreases sharply from 37 percent in hospitals with 50–99 beds to 4 percent in hospitals with less than 25 beds. A few of the hospitals in this group have developed their own formulary, but from a third to a half use a drug list.

Only 13 percent of all long-term hospitals in this group have a pharmacy and therapeutics committee, with a higher percentage being found among the larger hospitals. About 30 percent of these hospitals use a drug list while 10 percent use a formulary.

6.2 Status According to Ownership

The status of pharmacy and therapeutics committees, and formularies and drug lists according to owner-

TABLE 127. Type of Formulary or Drug List in Hospitals without Pharmacists According to Ownership

Ownership of Hospital	Number of Hospitals Reporting	Percent of Hospitals with Formulary or Drug List				Percent of Hospitals with Pharmacy and Therapeutics Committee
		Developed Own Formulary	Adopted Another Hospital's Formulary	Drug List	Total	
Governmental, non-federal	828	8	1	46	55	17
City	183	5	1	46	52	30
County	408	8	2	46	56	14
City-County	24	0	0	87	87	13
State	153	16	0	41	57	12
District	60	0	0	40	40	15
Governmental, federal	48	56	0	19	75	38
Army	0	0	0	0	0	0
Navy	0	0	0	0	0	0
Air Force	12	75	0	25	100	50
Public Health Service	33	54	0	19	73	36
Veterans Administration	0	0	0	0	0	0
Other federal	3	0	0	0	0	0
Non-governmental	1872	10	1	39	50	24
Church	306	8	1	43	52	38
Community	345	14	0	52	68	30
Fraternal order	18	0	0	17	17	17
Private non-profit	738	11	3	41	55	26
Private, profit	465	6	1	24	31	14
Average	100	10	1	41	52	22

2748 Hospitals reporting.

ship of the hospital is shown in Table 127. We note that 828 hospitals in this group are owned by non-federal governmental units, 48 by the federal government and 1872 by non-governmental organizations such as churches or communities. About 68 percent of these hospitals are non-governmental.

About 1 in 4 non-governmental hospitals has a pharmacy and therapeutics committee, with church and community hospitals having the highest percentages. Less than 1 out of 5 private-profit or fraternal order hospitals has such a committee. Fifty percent of non-governmental hospitals have either a formulary or drug list; the ratio of formularies to drug lists used is about 1:4. Only 17 percent of non-federal governmental hospitals have a committee; on the other hand over half have either a drug list or a formulary.

About one-third of Public Health Service hospitals and 50 percent of Air Force hospitals without full-time pharmacists have a pharmacy and therapeutics committee. Three out of 4 Air Force hospitals have developed their own formularies while the remainder employ a drug list. A little more than half of the Public Health Service hospitals in this group have developed a formulary.

TABLE 128. Frequency of Pharmacy and Therapeutics Committee Meetings

Number of Meetings Held Annually	Percent of Hospitals with Pharmacy and Therapeutics Committee
None	7
1–2	18
3–6	49
7–10	5
11–12	21
	100

6.3 Pharmacy and Therapeutics Committee Meetings

Out of the 600 short-term and long-term hospitals which have a pharmacy and therapeutics committee, about 50 percent meet 3 to 6 times a year, as shown in Table 128 (Q 10aS). Over 25 percent meet at least 7 times a year while an equal number meet less than 3 times a year. The number of meetings of the pharmacy and therapeutics committee in these hospitals compare favorably with those held by committees in hospitals with a full-time pharmacist, as shown in Table 88 (Chapter VIII). The findings

TABLE 129. Relationship of Pharmacy and Therapeutics Committee to Type of Formulary or Drug List

Type of Formulary or Drug List	Percent of Hospitals Reporting Pharmacy and Therapeutics Committee	
	Yes	No
Developed own formulary	29	5
Adopted another hospital's formulary	2	1
Drug list	54	37
Neither	15	57
Number of short- and long-term hospitals reporting status of pharmacy and therapeutics committee	(600)	(2148)

2748 Hospitals reporting.

TABLE 130. Relationship of the Status and Type of Formulary or Drug List to Pharmacy and Therapeutics Committee

Status of Pharmacy and Therapeutics Committee	Percent of Hospitals Reporting Type of Formulary or Drug List			
	Developed Own Formulary	Adopted Another Hospital's Formulary	Drug List	Neither
Yes	65	30	29	7
No	35	70	61	93
Number of short- and long-term hospitals reporting type of formulary or drug list	(273)	(39)	(1125)	(1311)

2748 Hospitals reporting.

do not show the extent of participation of the community pharmacist in pharmacy and therapeutics committee activities, nor the activities to which the committee devotes its time, nor the policies under which the committee operates.

6.4 Influence of Committee on Formulary

The relationship of the pharmacy and therapeutics committee to the type of formulary or drug list employed is shown in Table 129. Thus, 29 percent of the 600 hospitals with a committee developed their own formulary while 2 percent adopted another hospital's formulary; 54 percent of hospitals with a committee use a drug list while 15 percent of hospitals with a committee have neither a drug list nor a formulary. In contrast, among hospitals without a committee only 5 percent have developed their own formulary while 1 percent use another hospital's formulary; 37 percent use a drug list, but 57 percent of these 2148 hospitals use neither a drug list nor formulary. It is thus evident that the existence of a pharmacy and therapeutics committee tends to favor the use of a formulary or drug list. Nevertheless, a significant percentage of hospitals without a committee also uses a drug list or formulary. Thus, hospitals with a pharmacy and therapeutics committee tend to use drug lists in preference to a formulary at the ratio of 2 to 1, while in hospitals without a committee this ratio rises to 6 to 1. It is evident that the existence of a committee tends to favor greatly the use of a formulary in preference to a drug list.

6.5 Relationship of Formulary to Committee

Those hospitals which have a formulary or drug list also tend to have a pharmacy and therapeutics committee, as shown by Table 130. Thus, 65 percent of hospitals which developed their own formulary, and the 30 percent which adopted another formulary, and the 29 percent which developed a drug list—all have a committee. In the same manner we see that 7 percent of hospitals with neither a formulary nor a drug list have a committee. In contrast, 93 percent of those with neither of these aids do not have a pharmacy and therapeutics committee.

On the other hand, 35 percent of hospitals which developed their formulary did not have a pharmacy and therapeutics committee, nor did 70 percent of those which adopted another formulary or the 61 percent which developed a drug list. This information corroborates the findings of Table 128 relative to the interrelationship between the presence of a pharmacy and therapeutics committee and the development of a formulary or drug list. The relatively large number of drug lists in relation to the number of pharmacy and therapeutics committees implies that the drug list is used principally as a guide to the drugs stocked in the drug room, rather than having any implications of listing selected therapeutically effective drugs.

TABLE 131. Administrator's Attitude Toward Making a Change in Present Pharmacy Arrangement

Administrator's Attitude Toward Change in Pharmacy Arrangement	Method of Present Pharmacy Arrangement (Percent of Administrators Reporting)			Number of Administrators Reporting
	Personnel Other Than a Pharmacist, Including Other Methods	Personnel Other Than a Pharmacist, plus Arrangement with Community Pharmacy	Arrangement Whereby a Community Pharmacist Supervises Pharmacy Service	
Change	45	23	29	810
No change	43	66	59	1425
No response	12	11	12	279
Total administrators reporting	(1248[1])	(1230)	(234)	(2712)

[1]Includes 1197 hospitals that utilize non-pharmacy personnel without any type of arrangement with a community pharmacy and 51 that utilize other methods.

7

ATTITUDES TOWARD CHANGING PRESENT SERVICE

7.1 Attitude According to Present Method of Drug Service

The attitude of administrators toward making a change in their present methods of handling drugs in hospitals without full-time pharmacists depends greatly upon whether their present system involves some relationship with a community pharmacist (Table 131, Q 6cS). Administrators in those hospitals having a relationship with a community pharmacist tend to be more satisfied with their drug service. It is interesting to relate this attitude to the findings in Table 114 which show that the broadest scope of service is given in hospitals where the drug service is carried out by non-pharmacist personnel.

Overall, about 30 percent of administrators of 2712 hospitals would like to make some type of change in their present system of drug service. However, 45 percent of administrators in hospitals where a pharmacist is not in some way associated with the drug service would like to make a change. Only 23 percent of administrators want to change when the hospital has an arrangement with a community pharmacy, an arrangement which does not involve the pharmacist coming to the hospital to supervise the drug service. A slightly higher percentage of administrators desire a change in those situations where the community pharmacist does come to the hospital to supervise pharmacy service. Stated another way, two-thirds of administrators desire no change from their present system when non-pharmacist personnel in the hospital supply drug service backed up with an arrangement with a community pharmacist, one in which the pharmacist does not come to the hospital.

7.2 Attitude When Non-Pharmacists Provide Drug Service

Table 132 contains more detailed information concerning administrators' attitudes when non-pharmacist personnel provide drug service, excluding those hospitals in which the pharmacy service is supervised by the community pharmacist. Here we note that 40 percent of the administrators of 1782 short-term hospitals and 23 percent of long-term hospitals desire a change in their drug service. Further, we note that the desire for a change increases with bed size of the hospital. This is graphically presented in Figure 61. In short-terms hospitals of more than 50 beds, more than 50 percent of administrators desire a change. With the exception of 6 out of 10 administrators in long-term hospitals of 500 beds or more, which is not shown in the graph, less than 2 out of 5 administrators in long-term hospitals below 500 beds want a change. The attitude toward desiring a change is much greater in short-term than in long-term hospitals. This will be seen more clearly in Table 133.

7.3 Influence of Adjusted Rate of Change

When a comparison is made of the desire for a change using a standard population based on the size of all hospitals rather than on the size range of individual populations, that is, short-term and long-term hospitals as individual populations, we find a greater difference in the desire for a change. This is shown in Table 133. Here we find that administrators in short-term hospitals without full-time pharmacists are more inclined to change their present pharmacy arrangement, at a ratio of about 4:1, than those in long-term hospitals. This ratio results when the data is adjusted to be independent of the effect of hospitals in each bed size, and it is more accurate than the 2:1 ratio seen in Table 132.

TABLE 132. Administrator's Attitude Toward a Change in Present Pharmacy Arrangement When Non-Pharmacist Personnel Is Assigned to Pharmacy

	Short-Term Hospitals			Long-Term Hospitals		
Bed Capacity	Number of Hospitals Reporting	Percent Desiring Change	Percent Not Desiring Change	Number of Hospitals Reporting	Percent Desiring Change	Percent Not Desiring Change
1–24	351	22	78	12	0	100
25–49	693	32	68	57	5	95
50–99	516	51	49	159	19	81
100–199	205	64	36	105	14	86
200–299	17	62	38	36	42	58
300–399	—	—	—	21	43	57
400–499	—	—	—	9	0	100
500 and over	—	—	—	54	61	39
Total	1782			453		
Average	100	40	60		23	77

Excludes those 234 hospitals in which pharmacy service is supervised by community pharmacist and 279 hospitals that did not respond.

FIGURE 61. Rate of Hospitals Desiring Change in Pharmacy Arrangement, Now Staffed with Non-Pharmacists, Short-and Long-Term Hospitals

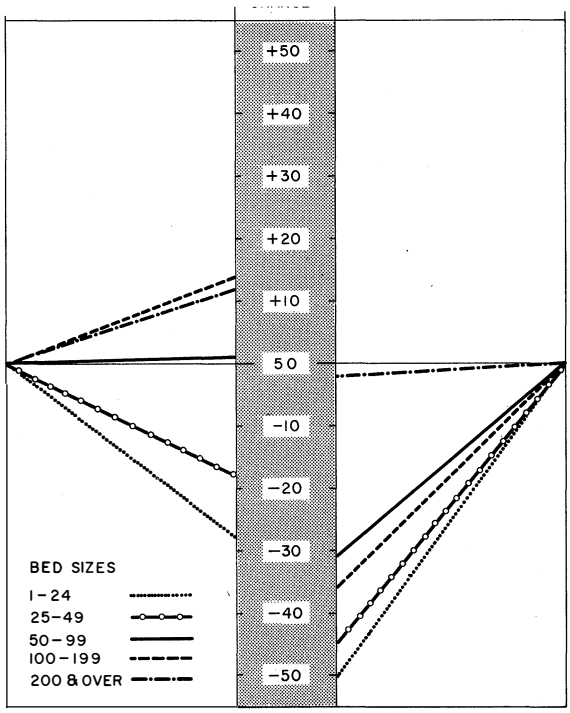


TABLE 133. Number of Hospitals Staffed with Non-Pharmacists Desiring Change in Present Pharmacy Arrangement, Based on Adjusted Rate Between Short-Term and Long-Term Hospitals

Bed Capacity	Standard Population[1]	Bed Capacity-Specific Rate for Change (Percent)		Hospitals Desiring Change in Standard Population on Basis of Ratio of (Number of Hospitals)	
		Short-Term	Long-Term	Short-Term	Long-Term
1–24	363	22	0	80	0
25–49	750	32	5	240	38
50–99	675	51	19	344	128
100–199	310	64	14	198	43
200–299	53	62	42	33	22
300 and over	84	0	39	0	18
Total	2235	—	—	895	249
Adjusted rate of change	—	40.5	11.1	3.6	1
Unadjusted rate of change	—	40	23	1.7	1

[1] Original data taken from Table 132. Standard population is the sum of all short-term and long-term hospitals reporting.

7.4 Attitude Toward Change According to Pharmacist or Non-Pharmacist Personnel

About 36 percent of administrators desire some change in their drug service regardless of whether it is being rendered by part-time non-pharmacist personnel in the hospital or by a community pharmacist who comes to the hospital a certain number of hours a week (Table 134). This desire for a change is related to the number of hours worked by these two groups. About 60 percent of part-time non-pharmacists are employed for less than 10 hours per week. The desire for a change increases almost directly with the number of hours worked. Over 50 percent of administrators desire a change when the part-time non-pharmacists work 20 or more hours a week, in contrast to less than a third when the personnel work under 10 hours a week. It appears somewhat paradoxical that the more hours someone is devoting to drug service the greater the implied dissatisfaction. If we assume, however, that the number of hours of work is directly related to the volume of drugs handled, it would not be difficult to postulate that in many hospitals drug volume is increasing to the point that it shows more clearly the inability of non-pharmacist personnel to assume pharmaceutical responsibilities for which they are not trained.

In a relatively small number of hospitals the community pharmacist comes to the hospital to personally supervise the pharmacy service. Here we find a reverse situation to that noted when non-pharmacist personnel alone provide drug service. When the pharmacists spend 15 or more hours per week in the hospital, none of the administrators want a change and are apparently generally satisfied with the service. On the other hand, when the pharmacist spends less than 10 hours in the hospital, about one-third of administrators want a change. The degree of satisfaction administrators have with their service from the community pharmacist will be noted later.

TABLE 134. Attitude of Hospital Administrator Toward Change When Part-Time Personnel Render Drug Service, in Relationship to Number of Hours Worked

Number of Hours Worked per Week	Part-Time Non-Pharmacist Personnel		Community Pharmacist Supervising the Pharmacy	
	Number of Administrators Reporting	Percent Desiring Change	Number of Administrators Reporting	Percent Desiring Change
Less than 5	576	23	150	34
5–9	507	36	42	36
10–14	339	46	6	50
15–19	144	47	9	0
20–29	141	57	3	0
30 or more	78	54	—	—
Total administrators	1785[1]	—	210[2]	—
Average	100	37	100	36

[1]Excludes 393 hospitals that have only full-time non-pharmacist personnel and 393 hospitals not responding.
[2]Excludes 24 administrators not responding to this question.

TABLE 135. Satisfaction of Administrators with Present Pharmacy Arrangements, from Viewpoint of Patient and Hospital, Percent of Hospitals Reporting

Degree of Satisfaction	Non-Pharmacist Personnel, without Arrangement with Local Community Pharmacist[1]		Non-Pharmacist Personnel, with Arrangement with Local Community Pharmacist		Local Community Pharmacist Personally Supervises Pharmacy Service at Hospital	
	Patient	Hospital	Patient	Hospital	Patient	Hospital
Very satisfactory	31	27	48	44	52	40
Satisfactory	51	41	39	34	41	39
Somewhat satisfactory	11	20	4	6	4	9
Not too to not at all satisfactory	—	1	3	3	2	4
No response	7	11	6	13	1	8
Number of hospitals reporting	(1248)		(1230)		(234)	

[1]Includes 51 hospitals that had other methods of handling drugs other than the methods mentioned in this table.

7.5 Degree of Satisfaction with Present Methods

Most hospital administrators tend to feel that the present method of handling drugs in their hospital is satisfactory (Table 135, Q 4S). In general, any of the three major types of arrangements for drug service is more satisfactory for the patient than it is for the hospital. The reasons for this were not elaborated in the basic data. Satisfaction for both the patient and the hospital is high when there is some type of arrangement with the local community pharmacist, and greatest when the pharmacist actually spends a number of hours a week in the hospital. In the latter case the arrangement is judged *satisfactory to very satisfactory* for the patient by 93 percent and for the hospital by 79 percent of administrators. Administrators indicate a high degree of satisfaction even when non-pharmacist personnel handle the drug service without any arrangement with a local community pharmacist. For example, 82 percent judge their arrangement *satisfactory to very satisfactory* for the patient and 69 percent consider it *satisfactory to very satisfactory* for the hospital. Administrators feel somewhat greater satisfaction when there is an arrangement with a community pharmacist to support the efforts of non-pharmacist personnel operating the hospital's drug service. Despite their stated satisfaction with present methods of handling drugs, however, about a third of administrators desire to make changes, as will be discussed later.

7.6 Satisfaction in Relationship to Amount of Time Pharmacist Spends in Hospital

Table 136 presents a more detailed study of one portion of Table 135, relating to hospitals where a community pharmacist spends a certain number of hours a week in the hospital supervising pharmacy service. Disregarding the non-response, we find that 195 out of 213, or about 91 percent of community pharmacists spend less than 10 hours a week supervising the hospital's drug service. These pharmacists function principally in hospitals with less than 100 beds.

The degree of satisfaction with the community pharmacist's service increases markedly when he spends 10 or more hours weekly in the pharmacy. The degree of satisfaction is high for both the patient and the hospital. When the pharmacist spends less than 10 hours per week, however, the arrangement is more satisfactory for the patient than it is for the hospital. Also, there is greater satisfaction when the pharmacist spends less than 5 hours a week than there is when he spends between 5–9 hours per week in the hospital. We judge this to be due to the size of the hospitals and their volume of drug service. For ex-

TABLE 136. Satisfaction of Administrators with Present Pharmacy Arrangement where Community Pharmacists Supervise Pharmacy Service, from Viewpoint of Patient and Hospital

How Satisfactory is Arrangement for	Degree of Satisfaction	Hours per Week Spent in Hospital by Community Pharmacist (Percent of Hospitals Reporting)				
		<5	5–9	10–14	15–20	>20
Patient	Very satisfactory	46	64	100	67	100
	Satisfactory	50	21	0	33	0
	Somewhat satisfactory	2	15	0	0	0
	Not too to not at all satisfactory	2	0	0	0	0
Hospital	Very satisfactory	46	54	100	50	100
	Satisfactory	50	23	0	50	0
	Somewhat satisfactory	2	15	0	0	0
	Not too to not at all satisfactory	2	8	0	0	0
Number of hospitals responding		(153)	(42)	(6)	(9)	(3)

TABLE 137. Major Problems Administrators Face in Changing Their Present Pharmacy Arrangements

Bed Capacity	Number of Hospitals Desiring Change	Problems Involving Changes in Pharmacy Arrangement (Percent of Hospital Administrators Reporting)						
		Cost	Size of Hospital	Space or Facilities	Unavailability of Pharmacist	Local Pharmacist Unwilling or Unable to Go to Hospital	Planning to Expand and Add Pharmacy	Other
Short-term								
1–24	78	38	38	12	19	—	—	8
25–49	222	39	30	16	30	4	1	19
50–99	264	36	22	25	32	—	5	14
100–199	126	26	5	17	38	—	10	19
200–299	15	40	—	20	60	—	—	40
All short-term	705	36	23	19	32	1	4	16
Long-term								
1–24	0	—	—	—	—	—	—	—
25–49	3	—	—	—	—	—	—	100
50–99	30	60	30	10	10	—	10	10
100–199	15	40	—	—	20	—	20	40
200–299	15	40	—	—	60	—	—	—
300–399	9	67	—	—	33	—	—	—
400–499	0	—	—	—	—	—	—	—
500 and over	33	45	—	—	73	—	—	18
All long-term	105	49	9	3	40	—	6	17
Average	100	38	21	17	33	1	4	16

39 Out of 810 hospitals did not respond.
810 Hospitals desiring change.

ample, less than 5 hours may be ample time for a pharmacist to handle the drug needs in some small hospitals, while 5–9 hours do not provide time enough to give the service required or expected in others.

7.7 Problems in Making Change

The major problems making it difficult for administrators to make a change in their present methods of handling drugs are shown in Table 137 (Q 6cS). Administrators in more than 700 short-term and more than 100 long-term hospitals want to make some type of a change. This represents about one-third of the 2208 short-term and about one-fifth of the 540 long-term hospitals which do not have the services of a full-time pharmacist.

Cost is a major problem to about one-third of administrators. To others the unavailability of a pharmacist ranks as a major problem, also among about one-third of administrators. While there is some overlapping among those citing these reasons, to many the difficulty in obtaining a pharmacist is more of a problem than cost. We note, however, that cost was stressed even by administrators in the hospitals with 200–299 beds. Still, these hospitals now employ an average of 2 full-time and 2 or more part-time persons. Thus, it would appear that the cost factor, at least in this size hospital, is over-rated. In fact, 40 percent of these administrators cited *other* problems preventing them from changing their drug service. One would expect a full-time pharmacist to effect savings quite beyond his additional salary. We believe a similar situation would result also in hospitals with 100–199 beds, and probably in those with 75 or more beds. In fact, 10 percent of the 100–199 bed hospitals are now planning to add a pharmacy, presumably with a pharmacist in charge.

The unavailability of a pharmacist is mentioned by a high percentage of administrators in hospitals with 100–299 beds, where one usually expects a full-time pharmacist to be in charge. In smaller hospitals, the unavailability of a pharmacist and the unwillingness of the local community pharmacist to come to the hospital to supervise the pharmacy probably overlap to the extent that it would be difficult to separate them. Many of these hospitals can justify only the part-time services of a pharmacist and often their only source of supply is the community pharmacy.

Among hospitals with less than 50 beds there is probably great interplay among the problems of cost, unavailability of a part-time pharmacist, and size of the hospital. One would expect cost to be a major problem, still about two-thirds of these respondents did not mention cost. One would also expect the unavailability of a pharmacist to be a major factor, still two-thirds of administrators did not mention this as a major problem. One may conclude that further exploration of these two areas would lead to solutions to these problems in a significant number of these hospitals.

Cost is cited by about half the administrators in long-term hospitals as the major problem in making a change in their drug service. This is closely followed by the unavailability of a pharmacist.

About 4 out of 5 administrators desiring a change did not state that space or facilities are problems. From other findings, however, we know that 3 out of 4 administrators who want to make a change would employ a pharmacist part-time or full-time. We also know that hospitals with pharmacists tend to maintain higher drug inventories and that the floor space available in most hospitals without pharmacists is very small. From these findings one may infer that space and facilities may be more of a problem than administrators now regard it to be. But it is undoubtedly a minor problem compared to others faced by administrators relative to their pharmacy service.

There is far greater variation among the long-term hospitals in extent of their use of drugs and, therefore, in the extent of their need for pharmacy service than there is among short-term hospitals. We note, however, that a pharmacy is being planned in 6 percent of this group. In general, because of the small drug usage in many long-term hospitals, one would expect to find the employment of full-time pharmacists practical in only those using a large volume of drugs. On the other hand, there is undoubtedly need for the part-time services of a pharmacist, but even here we would expect great variation in the time required to supervise the drug service.

Administrators in hospitals to which the community pharmacist comes to supervise the pharmacy service stressed cost and size of the hospital as major problems in making a change. Thus, 41 percent of them mentioned cost and 32 percent mentioned the size of the hospital. These percentages are somewhat greater than those found in Table 137 which represent the total number of administrators desiring a change.

8

DESIRED TYPE OF CHANGES IN PHARMACY SERVICE

8.1 Changes in Hospitals with Non-Pharmacists

About 30 percent of administrators in hospitals now without full-time pharmacists desire to make some type of a change in their drug service. The kinds of changes they would like to make are summarized in Table 138. Of those desiring to make a change, 26 percent are from short-term hospitals while 4 percent are from long-term hospitals. The numbers of administrators desiring a change reported in Table 138 are projections made from the responses received. The actual numbers of hospitals in the various size categories desiring a change are the same as those listed in Table 137. Thus, the figures in Table 138 are estimates of numbers involved when the findings are projected to all hospitals without a full-time pharmacist.

In the group of short-term hospitals, 18 percent would employ a pharmacist full-time while an additional 6 percent would employ a pharmacist and

TABLE 138. Changes Which Administrators Would Like to Make Regarding Present Pharmacy Arrangements in Hospitals Where Pharmacy Activities Are Carried out by Non-Pharmacists

Bed Capacity	Projected Number of Hospital Administrators Desiring a Change	Percent of Administrators Desiring Changes Involving Pharmacists				Percent of Administrators Desiring Changes not Involving Pharmacists	
		Employ Pharmacist			Establish Arrangement with Local Community Pharmacist	Employ Non-Pharmacist Personnel	Others[1]
		Full-Time	Assign Additional Hospital Duties	Part-Time			
Short-term							
1–24	153	15	8	35	12	15	15
25–49	435	14	4	43	14	8	17
50–99	510	15	8	56	7	6	8
100–199	166	28	3	64	5	—	—
200–299	15	33	0	50	0	—	17
All short-term	1269	18	6	50	9	7	10
Long-term							
1–24	0	0	0	0	0	—	—
25–49	6	0	0	0	0	—	100
50–99	61	0	11	78	0	11	—
100–199	30	0	0	50	17	17	16
200–299	30	25	0	75	0	—	—
300–399	18	33	0	67	0	—	—
400–499	0	0	0	0	0	—	—
500 and over	67	27	9	55	0	—	9
All long-term	212	17	6	60	3	5	9
Average	100[2]	18	6	51	8	7	10

[1]Improve methods and procedures, etc.
[2]1481 Total hospitals desiring change.

assign additional administrative duties to him. This means that 24 percent or about 1 out of 4 administrators in this group would employ a pharmacist full-time. Fifty percent of administrators in this group would employ a pharmacist part-time. Another 9 percent would establish an arrangement with a local community pharmacist. The remaining 17 percent of administrators would make changes which do not involve a pharmacist. For example, 7 percent would employ non-pharmacist personnel while 10 percent would take one of a number of actions involving improved methods and procedures which have been grouped together as *other*.

Thus, we note that of the 1481 administrators desiring a change, the emphasis is on the employment of pharmacists since almost 3 out of 4 would employ a pharmacist either full-time or part-time. Among the short-term hospitals with 100–299 beds, about 9 administrators in 10 want to employ a pharmacist. Almost 8 out of 10 administrators desiring a change in short-term hospitals with 50–99 beds would like to employ a pharmacist. Even in the two smallest groups of short-term hospitals, about 6 out of 10 administrators want to employ a pharmacist.

In order of preference, administrators desire to (1) employ a pharmacist part-time, (2) employ a pharmacist full-time, some of whom would be assigned additional administrative duties, (3) establish an arrangement with a community pharmacist, or (4) employ non-pharmacist personnel. The first two of these actions would place a pharmacist in the hospital to handle drugs and render pharmacy service. The arrangement with the community pharmacist could involve the presence of a pharmacist in the hospital, but we note in Table 113 that relatively few community pharmacists come to the hospital personally to supervise or render service. It is significant that 3 out of 4 administrators show preference for a change that would involve the actual presence of a pharmacist in the hospital. The findings in Table 138 reflect administrators' thinking on the problem of pharmacy service since the question asked was an open-ended type which called for administrators to initiate a response without being given a choice of possible actions from which to select.

The desire to employ a pharmacist and assign additional hospital duties relates to the findings shown in Table 36 (Chapter VI) which show that all pharmacists employed in short-term hospitals with less than 50 beds have additional administrative duties.

Among administrators of long-term hospitals, those who desire to change their pharmacy service tend to want to change it along the lines described for the short-term hospitals. Thus, 17 percent of those desiring a change would employ a pharmacist full-time, 6 percent would employ a pharmacist full-time and assign him additional hospital duties, while 60 percent would employ a pharmacist part-time.

From these findings one may infer that a significant group of administrators in hospitals now without the services of a pharmacist practicing within the hospital favor a plan to add a pharmacist to the hospital staff on either a full-time or part-time basis. We believe that this desire for a change is based upon the better communications and the greater opportunities to take advantage of the pharmacist's knowledge and skills when he serves within the walls of the hospital in direct contact with the medical and nursing staffs.

These findings also tend to support the predictions of future manpower needs in hospital pharmacy as discussed in Chapter V. To fill the needs expressed in Table 138, for example, would require about 395 hospital pharmacists on a full-time basis and about 740 on a part-time basis. One may anticipate that the demand for additional pharmacists in small hospitals will continue for some years. Several factors will tend to produce this demand. Among these are an increase in expenditure for drugs in hospitals, demands for outpatient prescription service, the adaptability of hospital pharmacists to perform additional hospital duties, and the addition of beds and new services to existing hospitals.

It would, we believe, be generally agreed that the best pharmacy service should result from the presence of a well-trained hospital pharmacist on a full-time basis. A number of these hospitals will be able to take this step. Many of them, however, will have to be content with the part-time services of a pharmacist. The source of these pharmacists will depend somewhat on local circumstances. In some cases the administrator may be able to obtain the part-time services of a pharmacist from a nearby hospital; in others he will find a pharmacist who desires to work only part-time; in still others he will work out a plan with a community pharmacist to supply his pharmacy service. In all of these cases the pharmacist employed will perform more effectively if he has had at least an orientation course in hospital pharmacy or has had experience working in a hospital with a wide scope of pharmacy service.

To lend direction and to raise the standards of service in hospitals with part-time pharmacists, it would be worthwhile for the American Society of Hospital Pharmacists to provide consulting services and training programs for the establishment of pharmaceutical service in small hospitals and related health institutions.

8.2 Changes Involving Community Pharmacy Arrangement

Out of the 1464 short-term and long-term hospitals which have some type of arrangement with a local community pharmacist (Table 113), 336 administrators, or 23 percent, would like to make some change in their present drug service. The types of changes they would like to make are shown in Table 139. This information was separated from the unprojected figures of Table 138 in order to show more clearly the effect the involvement of a community pharmacist has on an administrator's attitude toward a change in

TABLE 139. Changes Which Administrators Now Having Arrangements with Local Community Pharmacists Would Like to Make Regarding Pharmacy Service

Bed Capacity	Number of Hospital Administrators Desiring a Change	Percent of Administrators Desiring Changes Involving Pharmacists				Percent of Administrators Desiring Changes Not Involving Pharmacists	
		Would Employ Pharmacists			Establish Better Arrangement with Community Pharmacist		
		Full-Time	Full-Time Plus Additional Assigned Duties	Part-Time		Employ Non-Pharmacist Personnel	Other[1]
Short-term							
1–24	42	16	—	62	—	14	8
25–49	78	17	4	63	9	7	—
50–99	90	20	10	48	5	7	10
100–199	60	35	5	45	5	—	10
200–299	15	40	—	60	—	—	—
All short-term	285	23	6	54	5	7	7
Long-term							
1–24	0	—	—	—	—	—	—
25–49	6	—	—	—	—	50	50
50–99	18	15	14	43	—	14	14
100–199	3	—	—	—	—	—	100
200–299	12	25	—	50	—	—	25
300–399	3	—	—	100	—	—	—
400–499	3	—	—	—	—	—	100
500 and over	6	50	—	50	—	—	—
All long-term	51	23	6	41	—	6	24
Average	100[2]	23	6	52	5	7	7

[1] Improve methods and procedures, etc.
[2] 336 Total hospitals desiring change.

methods of providing drug service in relationship to his attitude when no pharmacist is involved.

About 8 out of 10 administrators in the 336 short-term and long-term hospitals in this group want to employ a pharmacist. Of these, 29 percent would employ a pharmacist full-time, some giving him additional administrative duties. Over half, 52 percent, would employ a pharmacist part-time. Only 5 percent mentioned that they would establish better arrangements with their local community pharmacist, although an additional 7 percent implied this to some extent by suggesting that they would like to improve methods and procedures, which are included in Table 139 as *other*. Seven percent of administrators would employ non-pharmacist personnel; we presume this to be in addition to their arrangement with the community pharmacist.

In short-term hospitals of 100–299 beds, which have an arrangement with the local community pharmacist, 40 percent of administrators would employ a pharmacist full-time; in hospitals with 50–99 beds, 30 percent would employ a pharmacist full-time. Thus, when this information is compared with the findings in Table 138 we note that administrators in hospitals with an arrangement with a community pharmacy tend to favor employing a full-time pharmacist more than do those in hospitals where the drug service is performed by non-pharmacist personnel. This may well be related to the relatively small amount of time the community pharmacist spends in the hospital.

Thus, it is evident that there is much work to be done by the profession to prepare its members to offer pharmacy service to small hospitals and related institutions. These efforts should be spearheaded by the American Society of Hospital Pharmacists, but they will require the active cooperation and participation by the colleges and boards of pharmacy, the state pharmaceutical associations, and the American Pharmaceutical Association.

RECOMMENDATIONS

10.1 Responsibility for Pharmaceutical Service. It is recommended that hospitals be encouraged to implement the principle that the pharmaceutical service be under the direction of a professionally competent, legally qualified pharmacist who will serve as a professional member of the staff responsible to the proper administrative authority of the hospital.

10.2 Study of Long-Term Hospitals and Hospitals under 100 Beds. It is recommended that the American Society of Hospital Pharmacists conduct a study to determine the characteristics of those long-term hospitals and of those short-term hospitals under 50 and between 50–99 beds which make it possible for them to employ a pharmacist full-time and to contrast these with the characteristics of a random sample of hospitals of the same size which are without the services of a pharmacist with the objective of recommending ways and means by which the service of a pharmacist may be made available to the latter hospitals on either a full-time or part-time basis.

10.3 Satellite Pharmacies. It is recommended that demonstration projects be undertaken to show the possibility of establishing a coordinated pharmaceutical service between teaching or base hospitals with a pharmacist and other hospitals lacking the service of a pharmacist. In this study consideration should be given to the extent to which pharmacy service can be supplied by the former to the latter, including such services as on-the-spot consultations, control of drug distribution within the hospital, furnishing of prepackaged and prelabeled medication, procurement, inventory control, etc.

10.4 ASHP-Sponsored Consulting and Training Programs. It is recommended that the American Society of Hospital Pharmacists provide consulting services and training programs for the establishment of pharmaceutical service in small hospitals and related health institutions according to their needs.

10.5 Role of Community Pharmacists. It is recommended that the profession develop a program to better acquaint community pharmacists with the duties and responsibilities expected of them when they provide pharmaceutical service to hospitals and, further, that community pharmacists be encouraged to accept part-time appointments in hospitals lacking the services of a pharmacist.

10.6 Programs for Community Practitioners. It is recommended that the American Society of Hospital Pharmacists sponsor lectures, institutes, seminars, and workshops for the benefit of community pharmacists providing pharmacy service to small hospitals and nursing homes.

10.7 Registry of Women Pharmacists. It is recommended that the American Society of Hospital Pharmacists establish and maintain a registry of experienced women pharmacists who prefer to practice in hospitals on a part-time basis only, and that this information be made available to small hospitals and related institutions.

10.8 Public Health Service Plans. It is recommended that short-term hospitals with less than 100 beds and larger long-term hospitals be encouraged to use the Public Health Service's *Suggested Plans for Hospital Pharmacies in 50, 100 and 200 Bed General Hospitals* as a guide in planning the hospital area devoted to pharmacy activities until better plans are provided.

10.9 Community Pharmacists on Pharmacy and Therapeutics Committees. It is recommended that pharmacists holding part-time positions in hospitals become acquainted with the objectives and functions of the pharmacy and therapeutics committee and the role of the pharmacist thereon and offer their services as secretary of the committee and coordinator of its activities.

10.10 Re-Assignment of Nurses. It is recommended that administrators and directors of nursing of small hospitals re-evaluate their present programs whereby a significant amount of critically needed professional nurses' time is being spent in drug service activities instead of nursing functions, and that consideration be given to the appointment of either part-time or full-time pharmacists to assume responsibility for pharmacy service and thereby release nurses for nursing care activities.

APPENDIXES

List of Appendixes

Appendix A

Audit of Pharmaceutical Service in Hospitals

AMERICAN PHARMACEUTICAL ASSOCIATION AND AMERICAN SOCIETY OF HOSPITAL PHARMACISTS

DON E. FRANCKE
program director
CLIFTON J. LATIOLAIS
assistant director
University Hospital
Ann Arbor, Michigan
phone: NO 2-2873

March 1957

Dear Chief Pharmacist:

You are probably familiar with the study of hospital pharmacy service which is being carried out by the Division of Hospital Pharmacy of the American Pharmaceutical Association and the American Society of Hospital Pharmacists under a grant from the United States Public Health Service. This study has been endorsed in principle by the American Hospital Association and the Catholic Hospital Association. Successful completion of this study will provide factual data which will serve as a basis for improving the quality and expanding the scope of pharmaceutical service to patients.

An important part of this study is the mail questionnaire which is being sent to a scientifically selected sample comprising approximately 3,600 hospitals subdivided according to size and type of service. We are asking you to participate in and contribute to this study by sending us the information requested in the attached enclosed questionnaire. In order that we may retain the accuracy of the sample and bring the study to a successful completion, it is essential that chief pharmacists in all hospitals fill out the questionnaire. We recognize that this is making some demands on your time but the value of the information from hospitals throughout the country will be most significant in improving pharmaceutical services in the interest of better patient care.

The Survey Research Center at the University of Michigan has assisted in developing the methodology and other phases of the study. As the questionnaires are returned, the results will be coded, tabulated and analyzed. A report of the analysis of this study will be made available to you through our organizations.

We would appreciate your prompt response in completing and returning the questionnaire to us in the self addressed envelope which is provided. We assure you that the information you furnish us will be held in strict confidence and will not be associated in any way with either your name or the name of your hospital. So that you may retain a copy of the questionnaire in your files, we have enclosed a duplicate.

Sincerely,

Don E. Francke

Don E. Francke
Program Director

P.S. In the event that you do not have a pharmacist in your hospital, will you please return the questionnaire in the enclosed envelope so that you may be contacted later regarding the method for handling drugs in your hospital.

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American Pharmaceutical Association
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INSTRUCTIONS

Most of the questions can be answered by making a check (✓) opposite one of the answers listed under the questions. If you do not find an answer listed which fits your case, make a check opposite the answer that comes closest to it, or write in your own answer.

Please disregard the small numbers in brackets which appear next to each question. These are merely IBM notations for coding purposes.

Please answer the questions in order. Do not skip around.

Please proceed to questions beginning on next page.

1. How many pharmacists (including yourself) are employed in your hospital?

	How many full time	How many part time
Men pharmacists	____	____
Women pharmacists ..	____	____
Pharmacy Interns ...	____	____
Total	[I:13-14] ____	[I:15-16] ____ [I:17-18] ____

2. In addition to the pharmacist staff, what other personnel do you employ in the pharmacy?

None ☐	How many full time	How many part time
Nurse	____	____
Technician	____	____
Helper or attendant ..	____	____
Secretary	____	____
Clerk	____	____
Other, specify	____	____
.....	____	____
Total	[I:19-20] ____	[I:21-22] ____ [I:23-24] ____

3. Under present conditions, how often do you have to rely on non-pharmacists to perform pharmaceutical duties, such as filling bottles, labeling containers, etc.?

(Check one) [I:25]

☐ All of the time
☐ Sometimes
☐ Only once in awhile
☐ Never

3a. How much responsibility must your non-pharmacists assume in these activities?

(Check one) [I:26]

☐ Very much
☐ Quite a bit
☐ Some
☐ Very little
☐ None at all

3b. How much supervision by a registered pharmacist are you able to provide for the non-pharmacist personnel performing these activities?

(Check one) [I:27]

☐ Very much
☐ Quite a bit
☐ Some
☐ Very little
☐ None at all

4. Do you hold a position in one or more of the following departments in addition to your pharmacy activities?

	Percent of your working time devoted to this activity
Hospital Purchasing Agent [I:28]	____
Central Sterile Supply Service [I:29]	____
Business Officer [I:30]	____
Assistant Administrator [I:31]	____
Blood Bank [I:32]	____
Clinical Laboratory [I:33]	____
X-Ray Department [I:34]	____
Central Storekeeper [I:35]	____
Other, Specify [I:36]	____
None of these ☐	

5. What is the title of your immediate administrative superior? [I:37]

_____

5a. Is this the administrative officer to whom you think you should report? [I:38]

Yes ☐ No ☐

5b. If not, to what administrative officer do you think you should report? [I:39]

_____

6. When you wish to present some problem to the medical staff either for recommendation or for approval, which three (3) of the following methods do you most frequently use?

(This is not a question to check)

Put the figure 1 in front of the most frequently used method

Put the figure 2 in front of the second most used method

Put the figure 3 in front of the third most used method

____ By a general memorandum to the medical staff [I:40]

____ By asking the administrator to present the problem to the medical staff [I:41]

____ By presenting the problem at a medical staff meeting yourself [I:42]

____ By discussing the problem first through a committee and then passing recommendations on to the medical staff [I:43]

____ By discussing the problem informally with certain members of the medical staff [I:44]

____ By some other method (explain) [I:45]

_____

6a. How satisfactory do you feel your communications with the medical staff are?

(Check one) [I:46]

- ☐ Very satisfactory
- ☐ Satisfactory
- ☐ Only somewhat satisfactory
- ☐ Not very satisfactory
- ☐ Not satisfactory at all

7. How would you rate the working relationship between the pharmacy and the following groups?

(Check one for each item listed below)

	Very good	Good	Fair	Not too good	Very poor
Administrator [I:47]	☐	☐	☐	☐	☐
Medical staff [I:48]	☐	☐	☐	☐	☐
Nursing department [I:49]	☐	☐	☐	☐	☐
Business office [I:50]	☐	☐	☐	☐	☐
Purchasing officer [I:51]	☐	☐	☐	☐	☐
Other hospital departments [I:52]	☐	☐	☐	☐	☐

7a. How interested are the following in working with you to improve the quality of pharmacy service to patients?

(Check one for each item listed below)

	Very interested	Interested	Only somewhat interested	Not too interested	Not interested at all
Administrator [I:53]	☐	☐	☐	☐	☐
Medical staff [I:54]	☐	☐	☐	☐	☐
Nursing department [I:55]	☐	☐	☐	☐	☐

8. How well do you feel the pharmacy is respected in the hospital as a whole (among medical and allied staffs, administration, etc.)?

(Check one) [I:56]

- ☐ Very well respected
- ☐ Well respected
- ☐ Only somewhat respected
- ☐ Not too well respected
- ☐ Not well respected at all

9. In general, how sympathetic is the administration to what you are trying to accomplish regarding such things as budget, personnel, equipment and space requirements?

(Check one) [I:57]

- ☐ Very sympathetic
- ☐ Sympathetic
- ☐ Indifferent
- ☐ Not very sympathetic
- ☐ Entirely unsympathetic

10. How much freedom do you have to run the pharmacy department the way you think it ought to be run?

(Check one) [I:58]

- ☐ Very much freedom
- ☐ Quite a bit of freedom
- ☐ A fair amount of freedom
- ☐ A little freedom
- ☐ No freedom at all

11. For which of the following items do you have established or written policies or procedures?

	Check whether you have or do not have an established policy or procedure		If so, is it written down	
	Yes	No	Yes	No
Outline of job descriptions [I:59]	☐	☐	☐	☐
Purchasing policy [I:60]	☐	☐	☐	☐
Pricing policy [I:61]	☐	☐	☐	☐
Statement of the objective of the pharmacy department [I:62]	☐	☐	☐	☐
Pharmacy organizational chart [I:63]	☐	☐	☐	☐
Orientation program for new employees [I:64]	☐	☐	☐	☐
Procedure for filing pharmaceutical information [I:65]	☐	☐	☐	☐
Regulations on handling flammable material [I:66]	☐	☐	☐	☐
Regulations controlling sanitary conditions [I:67]	☐	☐	☐	☐
Complete narcotic handling procedure [I:68]	☐	☐	☐	☐
Procedure for handling investigational drugs [I:69]	☐	☐	☐	☐
Procedure for checking filled prescriptions and orders to prevent errors in dispensing [I:70]	☐	☐	☐	☐
Procedure to control distribution of drug samples in hospital [II:9]	☐	☐	☐	☐
Procedure to protect against medication errors on nursing units [II:10]	☐	☐	☐	☐
Automatic stop orders for special medication [II:11]	☐	☐	☐	☐

11a. If some organized group, such as the American Society of Hospital Pharmacists, would prepare and make available a series of *suggested* policies or procedures covering these various activities, how useful would they be to you?

(Check one) [II:12]

- ☐ Extremely useful
- ☐ Useful
- ☐ Not very useful
- ☐ Not useful at all

12. Does your hospital have any of the following procedures regarding drugs on nursing units?

	(Check one) Yes	No	Don't Know
Procedure for supplying information on a drug to the nurse before she can administer the drug [II:13] ...	☐	☐	☐
Policy preventing nurses from changing labels, refilling containers, etc. of medications on nursing units [II:14]	☐	☐	☐
Suggested rules or procedures for writing medication orders by physicians so that nurses may properly interpret them [II:15]	☐	☐	☐

13. We would like to get information on the dispensing workload carried by hospital pharmacists. The term in-patient prescription, when dispensed for a specific patient only, may be known as drug slip, drug order, floor order, nurse requisition, depending upon the terminology used in various hospitals.

How many of these in-patient prescriptions are filled in your pharmacy per year?

_____ [II:16-19]

13a. If the following items were not included in the total prescriptions, please indicate how many of these orders you fill annually? [II:20-23]

Injectible antibiotics _____

Intravenous fluids _____

Drug orders _____

Others, please list _____

_____ _____

14. How much do you think your present dispensing procedure could be improved to help minimize errors in prescription filling?

(Check one) [II:24]

- ☐ Very much
- ☐ Quite a bit
- ☐ Somewhat
- ☐ A little
- ☐ Not at all

15. We are interested in the services you now provide and the services you would like to provide.

(Check as many as apply)

	Check services you are now providing	Check Services you would like to provide if you are not now providing them
In-patient prescription service [II:25] ..	☐	☐
Out-patient prescription service [II:26] ..	☐	☐
Supply stock drugs to nursing units [II:27]	☐	☐
Prescription compounding [II:28]	☐	☐
Inter-departmental drug needs [II:29] ..	☐	☐
Supply reagents, chemicals or drugs for hospital laboratories [II:30]	☐	☐
Bulk manufacturing program [II:31] ...	☐	☐
Sterile solution manufacturing program [II:32]	☐	☐
Drug information service [II:33]	☐	☐
Formulary system [II:34]	☐	☐
Product development and research [II:35]	☐	☐
Teaching responsibilities [II:36]	☐	☐

15a. What obstacles keep you from providing those services which you feel the pharmacy ought to render?

(Check as many as apply) [II:37]

- ☐ Lack of adequate staff
- ☐ Lack of qualified staff
- ☐ Lack of interest by administration
- ☐ Lack of interest by medical staff
- ☐ Lack of facilities
- ☐ Lack of space
- ☐ Lack of budget
- ☐ Others, specify _____

_____

16. What method is used in your hospital for providing pharmacy service when the pharmacy is closed?

(Check as many as apply) [II:38]

- ☐ A pharmacist is on call to go to the hospital if necessary
- ☐ A pharmacist is on "telephone call" only
- ☐ Nursing supervisor gets drugs from pharmacy
- ☐ An emergency drug cabinet is available
- ☐ A physician gets drugs from pharmacy
- ☐ Nursing supervisor or nurse accompanied by physician gets drugs from pharmacy
- ☐ Other method, explain _____

_____

16a. How satisfactory do you think this method is from the point of view of the nurse and physician?

(Check one) [II:39]

- ☐ Very satisfactory
- ☐ Satisfactory
- ☐ Only somewhat satisfactory
- ☐ Not very satisfactory
- ☐ Not satisfactory at all

17. Some pharmacists feel that business records of the pharmacy activities should be available for use by the pharmacist, whereas others do not think this is necessary.

(Check as many as apply)

	Check if you have available a record of these activities	Check if you think a record of these activities should be available if they are not now available
Drug purchasing record (i.e. unit cost, source, etc.) [II:40]	☐	☐
Departmental overhead (cost of salaries, maintenance, etc.) [II:41]	☐	☐
Cost of drugs per patient per day [II:42]	☐	☐
Average inventory [II:43]	☐	☐
Rate of drug stock turnover per year [II:44]	☐	☐
Departmental budget (for salaries, purchases, other expenses) [II:45]	☐	☐
Workload (number of prescriptions filled, requisitions, etc.) [II:46]	☐	☐
Others, specify _____ [II:47]	☐	☐

_____

17a. In order to run your department efficiently, do you think you now have:

(Check one) [II:48]

- ☐ Many more records than you need
- ☐ More records than you need
- ☐ About the right number of records
- ☐ Not enough records
- ☐ A very inadequate number of records

18. Do you have the authority to list acceptable sources of supply for drugs purchased in your hospital? (For example, if you want to obtain liver extract or any other drug, can you list a number of brands or companies acceptable to you and the medical staff and be sure of obtaining one of the brands specified?)

Yes ☐ No ☐

Answer 18a, b, and c *only* if you answered "no" to question 18.

18a. If you do not have this authority, who decides on the sources of supply? [II:49]

_____

18b. What do you do when drugs obtained from questionable sources of supply are delivered to the pharmacy to be dispensed under your professional supervision? [II:50]

_____

_____

_____

18c. Are these drugs obtained from questionable sources of supply tested or assayed either by your hospital or purchasing agency for quality and labeled strength?

(Check one) [II:51]

- ☐ All the time
- ☐ Often
- ☐ Once in a while
- ☐ Never

19. Does the medical staff give the pharmacy authority to dispense the official or generic drug when a trade name of the drug appears on the prescription?

Yes ☐ No ☐

19a. If yes—

How is this authority given?

(Check as many as apply) [II:52]

- ☐ Written policy by hospital
- ☐ Medical doctors sign agreement giving individual permission
- ☐ Verbal agreement
- ☐ Permission granted in each individual case
- ☐ Other method, specify _____

20. Has your hospital adopted a drug formulary?

Yes ☐ No ☐

20a. If yes, is it:

(Check one) [II:53]

- ☐ A formulary developed in your hospital
- ☐ Another hospital's formulary
- ☐ A drug list

20b. Do you believe that the American Hospital Formulary now being compiled by the American Society of Hospital Pharmacists as part of a formulary service would be helpful to you in your hospital? [II:54]

Yes ☐ No ☐

21. Are the nursing units supplied with references, such as *Facts and Comparisons, Modern Drug Encyclopedia, Physicians' Desk Reference,* etc.? [II:55]

Yes ☐ No ☐

22. Does your pharmacy routinely stock any brand of any drug called for? [II:56]

Yes ☐ No ☐

23. How many brands of the following drugs do you routinely carry in stock?

	(Check one for each item)						
	One	Two	Three	Four	Five	Six to Ten	Over Ten
Reserpine [II:57]	☐	☐	☐	☐	☐	☐	☐
Tetracycline [II:58] ..	☐	☐	☐	☐	☐	☐	☐
Hydrocortisone [II:59]	☐	☐	☐	☐	☐	☐	☐
Procaine Penicillin Injection (fortified) [II:60] ..	☐	☐	☐	☐	☐	☐	☐
Therapeutic Multi-vitamin Capsules [II:61] ..	☐	☐	☐	☐	☐	☐	☐

24. How often is competitive bidding utilized in the procurement of the same official drugs when more than one acceptable source of supply is available?

(Check one) [II:62]

- ☐ At all times
- ☐ Most of the time
- ☐ Sometimes
- ☐ Almost never
- ☐ Never

24a. If your hospital is part of a group set-up and the bidding is done by a central agency or office, please check here ☐.

25. In your present set-up, to what extent do you find it necessary to keep duplicate brands of the same official drugs?

(Check one) [II:63]

- ☐ To a very great extent
- ☐ Quite a bit
- ☐ Somewhat
- ☐ A little
- ☐ Not at all

25a. What would you say is the main reason for this? [II:64]

_____

_____

26. When a physician requests a drug which is not routinely stocked in the pharmacy—

26a. Is the drug ordered at once [II:65] Yes ☐ No ☐

26b. Is the physician informed that the drug is not approved for use in the hospital [II:66] ..... Yes ☐ No ☐

27. Does his request have to be considered by the Formulary Committee:

(Check one) [II:67]

- ☐ Before the drug is ordered for temporary stock
- ☐ Before the drug is approved officially for inclusion in the formulary

27a. If his request has to be considered by the Formulary Committee before it is ordered, how long does it take for the Committee to consider it?

(Check one) [II:68]

- ☐ One day
- ☐ 2-3 days
- ☐ 4-7 days
- ☐ 8-14 days
- ☐ Over 14 days

27b. During the time when the Formulary Committee is considering the request, does the patient:

(Check one) [II:69]

- ☐ Receive no drug
- ☐ Receive another drug
- ☐ Other, explain _____

_____

28. What would you estimate your present inventory of drugs to be?

(Check one) [III:9-10]

- ☐ Under $5,000
- ☐ $ 5,000–$ 9,999
- ☐ $ 10,000–$14,999
- ☐ $ 15,000–$19,999
- ☐ $ 20,000–$24,999
- ☐ $ 25,000–$29,999
- ☐ $ 30,000–$34,999
- ☐ $ 35,000–$39,999
- ☐ $ 40,000–$44,999
- ☐ $ 45,000–$49,999
- ☐ $ 50,000–$59,999
- ☐ $ 60,000–$79,999
- ☐ $ 80,000–$99,999
- ☐ $100,000 or over

28a. About how much did you spend for pharmaceuticals last year? [III:11-14]

$_____

28b. How often do you take a physical inventory of drugs?

(Check one) [III:15]

- ☐ Quarterly
- ☐ Semi-annually
- ☐ Annually
- ☐ Every two years
- ☐ Every five years
- ☐ Never take one

29. What was your annual rate of turnover of drugs last year? (Turnover may be figured by dividing your average inventory into your annual purchases).

(Check one) [III:16]

- ☐ 1 time
- ☐ 2 times
- ☐ 3 times
- ☐ 4 times
- ☐ 5 times
- ☐ 6 times

30. Is there a pharmacy and therapeutics committee in your hospital?

Yes ☐ No ☐

30a. If yes, about how many meetings does the committee hold per year? [III:17-18] _____

31. Listed below are activities which a pharmacy and therapeutics committee might perform. **Check** the activities which your committee is presently performing and those which you would like your committee to undertake. (The responsibility for some of these activities may be assigned to the chief pharmacist.)

	Check the activities now being performed by the P & T committee	Check if you would like the P & T committee to do this
Indicate which drugs are to be stocked in pharmacy [III:19]	☐	☐
Approve drugs by official or generic name rather than by trade name brands [III:20]	☐	☐
Delegate to chief pharmacist responsibility for preparing specifications and selecting acceptable sources of supply for drugs [III:21]	☐	☐
Help chief pharmacist evaluate claims made by pharmaceutical companies for superiority of certain competitive products of theirs [III:22]	☐	☐
Recommend procedures for order writing by medical doctors and interns [III:23]	☐	☐
Recommend policies governing investigational drugs [III:24]	☐	☐
Recommend list of emergency and other drugs to be stocked on nursing units [III:25]	☐	☐
Assist chief pharmacist in preparing drug information bulletins for medical and nursing staffs [III:26]	☐	☐
Assist in preparation and revision of formulary [III:27]	☐	☐
Recommend deletion of outmoded drugs [III:28]	☐	☐

32. About how often are you or members of your staff able to inspect the drugs **in the pharmacy** (with regard to such things as potency, decomposition, expiration dates, proper storage conditions, etc.) and how often would you like to make this inspection if you were able to?

	(Check one for each column) How often you now inspect [III:29]	How often you would like to inspect [III:30]
Every two years	☐	☐
Annually	☐	☐
Semi-annually	☐	☐
Quarterly	☐	☐
Monthly	☐	☐

We do not inspect ☐

We do not want to inspect ☐

33. About how often are you or members of your staff able to inspect the drugs **on nursing units** and how frequently would you like to make this inspection if you were able to?

	(Check one for each column) How often you now inspect [III:31]	How often you would like to inspect [III:32]
Every two years	☐	☐
Annually	☐	☐
Semi-annually	☐	☐
Quarterly	☐	☐
Monthly	☐	☐

We do not inspect ☐

We do not want to inspect ☐

If you have a manufacturing program, please complete questions 34 through 38 beginning below and continuing on next page. Otherwise, proceed to question 39 beginning on page 11.

34. We are interested in the activities of your manufacturing program. Indicate those factors you feel your program is accomplishing and those which you would like to have your manufacturing program do.

(34. Con't)

	(Check as many as apply) What your manufacturing program is doing now	What you would like your manufacturing program to do if it is not now doing so
To tie in with the operation of the formulary system [III:33]	☐	☐
To increase professional prestige of the pharmacy [III:34]	☐	☐
To promote economy [III:35]	☐	☐
To provide a wider scope of service [III:36]	☐	☐
To improve the technological ability of hospital pharmacists [III:37]	☐	☐
To provide products not commercially available [III:38]	☐	☐
To aid the research groups with pharmaceutical formulations [III:39] ...	☐	☐
To do product development and product improvement [III:40] ...	☐	☐
To help train interns or students in pharmacy [III:41]	☐	☐
To help utilize personnel efficiently during low periods of activity [III:42]	☐	☐
Other, Specify _____ [III:43]	☐	☐

35. Which of the following types of products do you compound routinely in bulk (manufacture) in your pharmacy?

(Check as many as apply)

Sterile Products [III:44]

- ☐ Large volume injectible solutions
- ☐ Small volume injectible solutions
- ☐ Sterile solutions for topical use
- ☐ Allergenic extracts
- ☐ Sterile dressings, trays, etc.
- ☐ Sterile pharmaceuticals, (such as ointments, ophthalmic solutions, powders, etc.)
- ☐ Special sterile products for investigational or clinical use

Non-Sterile Products [III:45]

- ☐ Galenical pharmaceuticals
- ☐ Products not commercially available
- ☐ Products for medical research projects
- ☐ Stains and reagents for laboratories
- ☐ Other products, i.e. detergents, waxes, cleansers, polishes, etc.

36. What do you estimate your savings through manufacturing to be during a one-year period?

(Check one) [III:46]

- ☐ Less than $1,000
- ☐ $ 1,000–$ 4,999
- ☐ $ 5,000–$ 9,999
- ☐ $10,000–$14,999
- ☐ $15,000–$19,999
- ☐ $20,000–$29,999
- ☐ $30,000–$49,999
- ☐ $50,000 or over
- ☐ breakeven
- ☐ or did you operate at a loss

37. Have you made a cost study on some of the products you manufactured during the past twelve months?

Yes ☐ No ☐

37a. If yes, which of the following items did you consider in your cost study?

(Check as many as apply) [III:47]

- ☐ Cost of ingredients
- ☐ Total direct labor costs
- ☐ Control costs
- ☐ Packaging and labeling costs
- ☐ Depreciation on equipment
- ☐ Supervisory personnel labor cost
- ☐ Pharmacy operating costs (heat, light, water, etc.)
- ☐ Fixed overhead expenses (administrative costs, building space, etc.)
- ☐ Comparison of your total unit cost to the lowest bid price on the same product from an acceptable source
- ☐ Other, specify _____

38. What is your current practice regarding control procedures on products you manufacture or compound in bulk?

(Check as many as apply) [III:48]

- ☐ Maintain master formula cards with manufacturing procedures for products manufactured
- ☐ Ingredient weights and measurements double checked by pharmacist
- ☐ Assign control number for each bottle prepared
- ☐ Packaging of finished product checked for correctness of labeling, identity, volume, proper container, etc.
- ☐ Visual inspection performed on finished product for clarity, appearance, etc.
- ☐ Chemical assays performed
- ☐ Sterility testing performed on sterile products
- ☐ Pyrogen testing performed on parenteral products
- ☐ None of these

All additional questions, numbers 39 through 73, are to be completed by everyone.

39. To what extent do you rely on the following sources for current information on therapeutics, new procedures and techniques, drugs, and general background in hospital pharmacy practices. Please indicate the extent of use of the following:

(Check one for each item)

	Very great deal	Quite a bit	Some	Little	None
Journals [III:49]	☐	☐	☐	☐	☐
Textbooks [III:50]	☐	☐	☐	☐	☐
Company literature [III:51]	☐	☐	☐	☐	☐
Society meetings (national) [III:52]	☐	☐	☐	☐	☐
Seminars and conferences (local and regional) [III:53]	☐	☐	☐	☐	☐
Institutes [III:54]	☐	☐	☐	☐	☐
Medical service representatives [III:55]	☐	☐	☐	☐	☐
Queries to national organizations [III:56]	☐	☐	☐	☐	☐

40. How many of the following types of publications does the pharmacy receive or have access to in the hospital library?

(Check one for each item)

	None	1-3	4-6	7-10	11-25	Over 25
Hospital Journals [III:57]	☐	☐	☐	☐	☐	☐
Pharmaceutical Journals [III:58]	☐	☐	☐	☐	☐	☐
Pharmacology and Medical Journals [III:59]	☐	☐	☐	☐	☐	☐
References, texts and other publications [III:60]	☐	☐	☐	☐	☐	☐

40a. Do you feel you receive an adequate number of these publications or do you feel you need more?

(Check one for each item)

	You receive an adequate number	You would like to receive more
Hospital Journals [III:61]	☐	☐
Pharmaceutical Journals [III:62]	☐	☐
Pharmacology and Medical Journals [III:63]	☐	☐
References, texts and other publications [III:64]	☐	☐

40b. What type of articles, which do not appear in the journals you receive, would be useful to you? [III:65]

_____

_____

_____

_____

_____

_____

_____

41. How would you rate the physical location of your pharmacy as far as providing reasonable service to the following various areas?

(Check one for each of the areas listed)

	Very convenient	Only somewhat convenient	Inconvenient	Practically inaccessible
Nursing divisions [IV:9]	☐	☐	☐	☐
Out-patient prescription service [IV:10]	☐	☐	☐	☐
Operating rooms [IV:11]	☐	☐	☐	☐
Out-patient clinics [IV:12]	☐	☐	☐	☐
Clinical laboratories [IV:13]	☐	☐	☐	☐
Medical staff [IV:14]	☐	☐	☐	☐

42. Indicate the approximate number of square feet of space presently allotted to the various areas of your pharmacy department and indicate the number of square feet of space you feel would be necessary for the type of service your pharmacy should provide.

	Present space in square feet	"Additional" sq. ft. of space you feel you need
Compounding and dispensing	_____ [IV:15-18]	_____ [IV:19-22]
Parenteral solution laboratory	_____ [IV:23-26]	_____ [IV:27-30]
Storage area for pharmaceutical stock	_____ [IV:31-34]	_____ [IV:35-38]
Manufacturing laboratory	_____ [IV:39-42]	_____ [IV:43-46]
Office and library area	_____ [IV:47-49]	_____ [IV:50-52]
Other _____	_____ [IV:53-55]	_____ [IV:56-58]
Total	_____ [IV:59-62]	_____ [IV:63-66]

43. How adequate is your present storage space and facilities for the following:

(Check one for each item)

	Very adequate	Adequate	Poor	Very inadequate
Biological and thermolabile drugs [IV:67]	☐	☐	☐	☐
Flammable and volatile chemicals [IV:68]	☐	☐	☐	☐
Narcotics [IV:69]	☐	☐	☐	☐
Alcohol (tax free and tax paid) [IV:70]	☐	☐	☐	☐

43a. Are some of your drugs stored in a central hospital storeroom? [IV:71]

Yes ☐ No ☐

44. How helpful is the average medical service representative (detail man) to you in providing the type of pharmaceutical information needed about his company's products?

(Check one) [V:9]

☐ Very helpful

☐ Helpful

☐ Only somewhat helpful

☐ Not too helpful

☐ Not helpful at all

45. Could you approximate the number of times you are called on to provide information on the following:

(Check one for each item)

	Several times a day	Several times a week	Several times a month	Less often
Dosage [V:10]	☐	☐	☐	☐
Dosage forms [V:11]	☐	☐	☐	☐
Pharmacological data [V:12]	☐	☐	☐	☐
Toxicological information [V:13]	☐	☐	☐	☐
Side reactions and contraindications [V:14]	☐	☐	☐	☐
Comparison of potency of products [V:15]	☐	☐	☐	☐
Comparison of efficacy of products [V:16]	☐	☐	☐	☐
Cost comparison of similar products [V:17]	☐	☐	☐	☐
Chemical data on drugs [V:18]	☐	☐	☐	☐

45a. If you had received a well planned sequence of courses in the biological sciences (anatomy, physiology, bacteriology, biological chemistry and pharmacology) could you be more helpful to physicians and nurses in supplying information on actions, uses, side effects, etc. of drugs? [V:19]

Yes ☐ No ☐

46. How adequate is your present equipment for carrying out the following activities:

(Check one for each item)

	Very adequate	Adequate	Poor	Very inadequate
Prescription dispensing [V:20]	☐	☐	☐	☐
Prescription compounding [V:21]	☐	☐	☐	☐
Bulk compounding (manufacturing) [V:22]	☐	☐	☐	☐
Product control (assay, sterility testing, etc.) [V:23]	☐	☐	☐	☐
Sterile product manufacturing [V:24]	☐	☐	☐	☐
Records and office procedures [V:25]	☐	☐	☐	☐
Library reference facilities [V:26]	☐	☐	☐	☐
Product development and special formulations for medical staff [V:27]	☐	☐	☐	☐

47. Do you do any teaching to the following and to what extent do you participate in this activity?

(If yes, check the appropriate column for each line)

	Yes	No	Do you teach a complete course	Do you give lectures periodically	Do you give only 1 or 2 lectures in the course
Medical students [V:28]	☐	☐	☐	☐	☐
Student nurses [V:29]	☐	☐	☐	☐	☐
Pharmacy students (graduate) [V:30]	☐	☐	☐	☐	☐
Pharmacy students (undergraduate) [V:31]	☐	☐	☐	☐	☐
Graduate nurses [V:32]	☐	☐	☐	☐	☐
Others _____	☐	☐	☐	☐	☐
_____ [V:33]	☐	☐	☐	☐	☐

48. Are you ever called upon to provide consulting assistance on pharmaceutical matters to hospitals without a pharmacist? [V:34]

Yes ☐ No ☐

48a. How would you feel about rendering this service?

(Check one) [V:35]

- ☐ I would like to very much
- ☐ I would like to
- ☐ I would be indifferent
- ☐ I would not like it very much
- ☐ I would not do it at all

49. To what extent has your position as chief pharmacist offered you an opportunity to carry out any of the following (or similar) projects?

(Check one for each item)

	Very great deal	Quite a bit	Some	Little	None
Working out dosage forms (vehicles, etc. for preparations not commercially available) [V:36]	☐	☐	☐	☐	☐
Working with medical and nursing staffs in setting up ward stock and emergency drugs [V:37]	☐	☐	☐	☐	☐
Time and motion studies to improve existing pharmacy procedures [V:38]	☐	☐	☐	☐	☐
Studies to extend and improve certain phases of pharmacy services (for example: providing pharmaceuticals and diagnostic reagents to clinical laboratories, information service to allied staffs, etc.) [V:39]	☐	☐	☐	☐	☐

50. Do you receive requests by the medical staff to prepare special formulations for them or to assist in pharmaceutical problems involving their investigative work?

(Check one) [V:40]

- ☐ Very often
- ☐ Often
- ☐ Sometimes
- ☐ Very seldom
- ☐ Never

50a. Do you like this type of work?

(Check one) [V:41]

- ☐ A very great deal
- ☐ Quite a bit
- ☐ Some
- ☐ A little
- ☐ None

50b. Do you think this should be a part of the pharmacist's job? [V:42]

Yes ☐ No ☐

51. How many Institutes on Hospital Pharmacy sponsored by the American Hospital Association or the Catholic Hospital Association in cooperation with the A.S.H.P. and A.Ph.A. have you attended?

(Check one) [V:43]

- ☐ None
- ☐ One
- ☐ Two
- ☐ Three
- ☐ Four
- ☐ Five
- ☐ More than five

51a. If you did attend one or more Institutes, how valuable do you feel these training programs are in helping you to provide a better pharmaceutical service in your hospital?

(Check one) [V:44]

- ☐ Very valuable
- ☐ Quite valuable
- ☐ Somewhat valuable
- ☐ Of little value
- ☐ Of no value at all

52. How well do you feel you are able to keep up with advances being made in your specialty?

(Check one) [V:45]

- ☐ Very well
- ☐ Fairly well
- ☐ Not so well
- ☐ Not at all

53. How many years of **undergraduate** pharmaceutical education have you and the pharmacists on your staff had?

	(Check one for each pharmacist)						
	None	1 yr.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	6 yrs.
Chief pharmacist [V:46]	☐	☐	☐	☐	☐	☐	☐
Assistant chief pharmacist [V:47]	☐	☐	☐	☐	☐	☐	☐
Supervisor pharmacist [V:48]	☐	☐	☐	☐	☐	☐	☐
Part-time or relief pharmacist [V:49]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:50]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:51]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:52]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:53]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:54]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:55]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:56]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:57]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:58]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:59]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:60]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:61]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:62]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:63]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:64]	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [V:65]	☐	☐	☐	☐	☐	☐	☐

53a. Check below the degree or degrees **you** received and indicate the year you received it (them).

	Check as many as apply	Year
Ph.G. or Ph.C. [VI:9-10]	☐	____
Bachelor of Arts [VI:11-12]	☐	____
Bachelor of Science [VI:13-14]	☐	____
Master of Science [VI:15-16]	☐	____
Ph.D. or D.Sc. [VI:17-18]	☐	____
Other, specify [VI:19-20]	☐	____

_____

54. Considering the demands placed upon you in hospital pharmacy practice today, in which of the following areas do you think you should have received additional education?

(Check as many as apply) [VI:21]

- ☐ Biological sciences (such as, biochemistry, pharmacology, physiology, anatomy, etc.)
- ☐ Physical sciences (physics, physical pharmacy, mathematics, etc.)
- ☐ Business administration (economics, management, administration, marketing, accounting, etc.)
- ☐ Pharmacy and chemistry (dispensing, product formulation, pharmaceutical chemistry, organic chemistry, etc.)
- ☐ General education and the arts
- ☐ Other areas, specify _____
- ☐ I do not feel I should have received additional education in any of these areas.

55. Did you complete a formal type of hospital pharmacy internship in which the training was based upon the Minimum Standard for Pharmacy Internships? [VI:22]

Yes ☐ No ☐

55a. How many pharmacists on your staff have completed such a program? [VI:23-24]

_____

56. Did you serve a period of informal apprenticeship (mainly to satisfy State Board of Pharmacy requirements for licensure) in a hospital in which the training was not based upon the Minimum Standard for Pharmacy Internships? [VI:25]

Yes ☐ No ☐

56a. How many pharmacists on your staff have completed such an apprenticeship? [VI:26-27]

_____

57. Did you obtain your practical experience or apprenticeship in a retail pharmacy to satisfy your State Board requirements? [VI:28]

Yes ☐ No ☐

57a. How many pharmacists on your staff have completed such an apprenticeship? [VI:29-30]

_____

58. Considering the demands placed upon you in hospital pharmacy practice today, in which of the following areas do you think you should have received additional training during your apprenticeship or internship?

(Check as many as apply) [VI:31]

- ☐ Dispensing
- ☐ Compounding
- ☐ Manufacturing
- ☐ Product development
- ☐ Administrative skills
- ☐ Personnel management
- ☐ Skills in communication
- ☐ Ability to organize
- ☐ Others, specify _____
- ☐ I do not feel that I should have received additional training during my apprenticeship or internship.

59. How well do you feel your **undergraduate pharmaceutical education** prepared you for hospital pharmacy practice?

(Check one) [VI:32]

- ☐ Very well
- ☐ Well
- ☐ Fair
- ☐ Not too well
- ☐ Very poor

(Answer 59a. **only if you attended graduate school)**

59a. How well do you feel your **graduate pharmaceutical education** prepared you for hospital pharmacy practice?

(Check one) [VI:33]

- ☐ Very well
- ☐ Well
- ☐ Fair
- ☐ Not too well
- ☐ Very poor

60. Do you think that a professionl degree of doctor of pharmacy (a six year program) is desirable in the practice of hospital pharmacy? [VI:34]

Yes ☐ No ☐

61. To what extent do you feel that the services you render as a hospital pharmacist give you a sense of professional satisfaction?
(Check one) [VI:35]

☐ To a very great extent
☐ Quite a bit
☐ Somewhat
☐ Little
☐ None

62. How satisfied are you with the following aspects of your position as a hospital pharmacist?

(Check one for each item)

	Very satisfied	Satisfied	Not too satisfied	Not satisfied at all
Pay [VI:36]	☐	☐	☐	☐
Opportunity for advancement [VI:37]	☐	☐	☐	☐
Use of your education effectively [VI:38]	☐	☐	☐	☐
Security [VI:39]	☐	☐	☐	☐
Prestige [VI:40]	☐	☐	☐	☐
Working conditions [VI:41]	☐	☐	☐	☐
Challenging work [VI:42]	☐	☐	☐	☐
Other, list [VI:43] _____	☐	☐	☐	☐

63. What is your current source of **professional** income?

(Check as many as apply) [VI:44]

☐ Do not receive a salary
☐ Hospital salary
☐ Hospital salary plus bonus
☐ Consulting fees
☐ Teaching
☐ Part time practice in retail pharmacy
☐ Other, specify _____

64. **We are interested in knowing the attitudes of hospital pharmacists toward their professional organizations and whether or not they participate in the activities both nationally and locally.**
How long have you been a member of the American Pharmaceutical Association, the American Society of Hospital Pharmacists and your local hospital pharmacy group?

(Check one for each column)

	A.Ph.A. [VI:45]	A.S.H.P. [VI:46]	A local hospital pharmacy group [VI:47]
I do not belong	☐	☐	☐
Less than 1 year ..	☐	☐	☐
1 to 2 years	☐	☐	☐
3 to 5 years	☐	☐	☐
6 to 10 years	☐	☐	☐
11 to 15 years	☐	☐	☐
More than 15 years	☐	☐	☐

65. To what extent do you feel that the activities of the American Society of Hospital Pharmacists are contributing toward the improvement of hospital pharmacy practice?
(Check one) [VI:48]

☐ To a very great extent
☐ Quite a bit
☐ Somewhat
☐ Little
☐ None
☐ Don't know

66. In general, how would you rate the professional competence of the pharmacists working in your department?
(Check one) [VI:49]

☐ Very good
☐ Good
☐ Fair
☐ Not too good
☐ Very poor

If you are the only pharmacist, check here ____.

66a. How well do you feel most of the pharmacists under your supervision carry out the functions you would like them to perform?
(Check one) [VI:50]

☐ Very well
☐ Well
☐ Fair
☐ Not too well
☐ Very poor

If you are the only pharmacist, check here ____.

67. Please check the appropriate age bracket for each of the pharmacists working in your department.

	(Check one for each pharmacist)				
	20-29	30-39	40-49	50-59	60 or over
Chief pharmacist [VI:51]	☐	☐	☐	☐	☐
Assistant chief pharmacist [VI:52]	☐	☐	☐	☐	☐
Supervisor pharmacist [VI:53]	☐	☐	☐	☐	☐
Part-time or relief pharmacist [VI:54]	☐	☐	☐	☐	☐
Staff pharmacist [VI:55]	☐	☐	☐	☐	☐
Staff pharmacist [VI:56]	☐	☐	☐	☐	☐
Staff pharmacist [VI:57]	☐	☐	☐	☐	☐
Staff pharmacist [VI:58]	☐	☐	☐	☐	☐
Staff pharmacist [VI:59]	☐	☐	☐	☐	☐
Staff pharmacist [VI:60]	☐	☐	☐	☐	☐
Staff pharmacist [VI:61]	☐	☐	☐	☐	☐
Staff pharmacist [VI:62]	☐	☐	☐	☐	☐
Staff pharmacist [VI:63]	☐	☐	☐	☐	☐
Staff pharmacist [VI:64]	☐	☐	☐	☐	☐
Staff pharmacist [VI:65]	☐	☐	☐	☐	☐
Staff pharmacist [VI:66]	☐	☐	☐	☐	☐
Staff pharmacist [VI:67]	☐	☐	☐	☐	☐
Staff pharmacist [VI:68]	☐	☐	☐	☐	☐
Staff pharmacist [VI:69]	☐	☐	☐	☐	☐
Staff pharmacist [VI:70]	☐	☐	☐	☐	☐

68. How many years have each of the pharmacists been practicing hospital pharmacy?

	(Check one for each pharmacist)				
	Under 3 yrs.	3-5 yrs.	6-9 yrs.	10-19 yrs.	20 or over
Chief pharmacist [VII:9]	☐	☐	☐	☐	☐
Assistant chief pharmacist [VII:10]	☐	☐	☐	☐	☐
Supervisor pharmacist [VII:11]	☐	☐	☐	☐	☐
Part-time or relief pharmacist [VII:12]	☐	☐	☐	☐	☐
Staff pharmacist [VII:13]	☐	☐	☐	☐	☐
Staff pharmacist [VII:14]	☐	☐	☐	☐	☐
Staff pharmacist [VII:15]	☐	☐	☐	☐	☐
Staff pharmacist [VII:16]	☐	☐	☐	☐	☐
Staff pharmacist [VII:17]	☐	☐	☐	☐	☐
Staff pharmacist [VII:18]	☐	☐	☐	☐	☐
Staff pharmacist [VII:19]	☐	☐	☐	☐	☐
Staff pharmacist [VII:20]	☐	☐	☐	☐	☐
Staff pharmacist [VII:21]	☐	☐	☐	☐	☐
Staff pharmacist [VII:22]	☐	☐	☐	☐	☐
Staff pharmacist [VII:23]	☐	☐	☐	☐	☐
Staff pharmacist [VII:24]	☐	☐	☐	☐	☐
Staff pharmacist [VII:25]	☐	☐	☐	☐	☐
Staff pharmacist [VII:26]	☐	☐	☐	☐	☐
Staff pharmacist [VII:27]	☐	☐	☐	☐	☐
Staff pharmacist [VII:28]	☐	☐	☐	☐	☐

69. What is the present annual hospital salary of the following members of the pharmacy staff?

(Check one for each pharmacist)

	Receives no salary	Under $4,000	$4,000 to $4,499	$4,500 to $4,999	$5,000 to $5,499	$5,500 to $5,999	$6,000 to $6,499	$6,500 to $6,999	$7,000 to $7,999	$8,000 to $8,999	$9,000 to $9,999	$10,000 or over
Chief pharmacist [VII:29]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Assistant chief pharmacist [VII:30]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Supervisor pharmacist [VII:31]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
*Relief or part-time pharmacist [VII:33]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:33]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:34]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:35]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:36]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:37]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:38]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:39]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:40]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:41]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:42]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:43]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:44]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:45]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:46]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:47]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Staff pharmacist [VII:48]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

*Project his salary to an annual salary equivalent

70. Please check the following data regarding the type and size of your hospital.

Length of Stay

(Check one) [VII:49]

- Short-term (30 days or less) ☐
- Long-term (over 30 days) ☐

Type of Service

(Check one) [VII:50]

- General ☐
- Special ☐

Bed Size (excluding bassinets)

(Check one) [VII:51]

- Under 50 beds ☐
- 50–99 ☐
- 100–199 ☐
- 200–299 ☐
- 300–399 ☐
- 400–499 ☐
- 500 or over ☐

Ownership

(Check one) [VII:52-53]

Governmental, Non-Federal

- City ☐
- County ☐
- City-County ☐
- State ☐

Governmental, Federal

- Army ☐
- Navy ☐
- Air Force ☐
- Public Health Service ☐
- Veterans Administration ☐
- Other Federal ☐

Non-Governmental

- Church, specify ☐
  - Denomination _____
- Community ☐
- Fraternal Order ☐
- Private, not for profit ☐
- Private, for profit ☐

71. Does your hospital have a formal affiliation with a medical school in your area?

Yes ☐ No ☐

71a. If yes, is it the **principal** teaching hospital of the medical school? [VII:54]

Yes ☐ No ☐

72. How many in-patient admissions (excluding newborns) does your hospital have annually?

(Check one) [VII:55]

- ☐ Under 1,000
- ☐ 1,000– 2,499
- ☐ 2,500– 4,999
- ☐ 5,000– 9,999
- ☐ 10,000–19,999
- ☐ 20,000–29,999
- ☐ 30,000–39,999
- ☐ 40,000–49,999
- ☐ 50,000 or over

72a. How many patient-days per year? [VII:56-58]

_____.

73. How many out-patient visits does your hospital have annually? [VII:59-61]

_____

73a. Of these, what percentage were:

Free or part pay _____% [VII:62]

Private _____% [VII:63]

Finally, what comments would you like to make about this survey itself—the questionnaire, the procedures, or any other aspect? (Use the back of this page for comments.)

Appendix B

Audit of Pharmaceutical Service in Hospitals

AMERICAN PHARMACEUTICAL ASSOCIATION AND AMERICAN SOCIETY OF HOSPITAL PHARMACISTS

DON E. FRANCKE
program director
CLIFTON J. LATIOLAIS
assistant director
University Hospital
Ann Arbor, Michigan
phone: NO 2-2873

July 1957

Dear Administrator:

You have probably read about the study of hospital pharmacy service which is being conducted by the Division of Hospital Pharmacy of the American Pharmaceutical Association and the American Society of Hospital Pharmacists. This study is supported by a grant from the Public Health Service through appropriations for Hospital and Medical Facilities Research Activities under the Hill Burton program. This study also has been endorsed by the American Hospital Association and the Catholic Hospital Association.

As a part of our overall study we are using the mail questionnaire which is being sent to a scientifically selected sample comprising approximately 3,600 hospitals subdivided according to size and type of service. Since your hospital is included in the sample we are asking you to participate in and contribute to this study by sending us the information requested in the attached questionnaire. This part of our overall study is aimed toward finding out the circumstances and problems involving pharmacy services in different types of hospitals. In order that we may retain the accuracy of the sample, it is essential that we receive the completed questionnaire from all the hospitals in our sample. The information we receive will be valuable in determining the best methods for improving pharmaceutical service in hospitals throughout the country.

The Survey Research Center at the University of Michigan has assisted in developing the methodology and other phases of the study. As the questionnaires are returned, the results will be coded, tabulated and analyzed. A report of the analysis of the overall study will be made available to you through our organizations.

We would appreciate it very much if you would complete and return the questionnaire to us in the self-addressed envelope within the next few days. We assure you that the information you furnish us will be held in strict confidence and will not be associated in any way with either your name or the name of your hospital. So that you may retain a copy of the questionnaire in your files, we have enclosed a duplicate.

Thank you for your cooperation.

Sincerely,

Don E. Francke

Don E. Francke
Program Director

P.S. If you *do have* a pharmacist employed in your hospital, please place a check mark in the space provided and return this questionnaire in the enclosed envelope. A different questionnaire will then be sent to your chief pharmacist. ☐

Advisory Committee Members

American Pharmaceutical Association

Robert P. Fischelis, *Secretary*
American Pharmaceutical Association
2215 Constitution Avenue, N.W.
Washington 7, D.C.

Glenn L. Jenkins, *Dean*
Purdue University
School of Pharmacy
Lafayette, Indiana

American Hospital Association

Robert R. Cadmus, *Director*
North Carolina Memorial Hospital
University of North Carolina
Chapel Hill, North Carolina

Catholic Hospital Association

Sister M. Stephanina, *Administrator*
Motherhouse of the Community of St. Francis
Mishawaka, Indiana

American Society of Hospital Pharmacists

George F. Archambault, *Pharmacist Director*
Chief, Pharmacy Branch
Division of Hospitals
U. S. Public Health Service
Washington 25, D.C.

Grover C. Bowles, *Director*
Department of Pharmacy
Baptist Memorial Hospital
Memphis 3, Tennessee

Don E. Francke, *Chief Pharmacist*
University Hospital
University of Michigan
Ann Arbor, Michigan

Leo F. Godley, *Chief Pharmacist*
Bronson Methodist Hospital
Kalamazoo, Michigan

Paul F. Parker, *Director*
Division of Hospital Pharmacy
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Committee on Hospital Pharmacy Practice

George F. Archambault, *Pharmacist Director*
Chief, Pharmacy Branch
Division of Hospitals
U. S. Public Health Service
Washington 25, D.C.

Evlyn Gray Scott, *Director of Pharmacy Service*
St. Luke's Hospital
Cleveland 4, Ohio

Walter M. Frazier, *Chief Pharmacist*
Springfield City Hospital
Springfield, Ohio

Grover C. Bowles, *Director*
Department of Pharmacy
Baptist Memorial Hospital
Memphis 3, Tennessee

INSTRUCTIONS

Most of the questions can be answered by making a check (✓) opposite one of the answers listed under the questions. If you do not find an answer listed which fits your case, make a check opposite the answer that comes closest to it, or write in your own answer.

Please disregard the small numbers in brackets which appear next to each question. These are merely IBM notations for coding purposes.

Please answer the questions in order. Do not skip around.

Please proceed to questions beginning on next page.

1. Do you have a registered pharmacist *employed* by the hospital?
(Check one) [I:15]

___ Full time

___ Part time

___ Do not have any

1a. If you have a pharmacist part-time, how many hours *per week* does he work in the hospital?
(Check one) [I:16]

___ Less than 5 hours

___ 5 - 9 hours

___ 10 - 14 hours

___ 15 - 20 hours

___ Over 20 hours

2. If you do not employ a pharmacist either full-time or part-time, how are drugs handled in your hospital?
(Check one) [I:17]

___ You have personnel other than a pharmacist to handle the drugs for you.

___ You have personnel other than a pharmacist to handle the drugs for you in addition to having an arrangement with some local drug store or pharmacy.

___ You have an arrangement with some local drug store or pharmacy where the pharmacist supervises pharmacy service for your hospital.

___ Other method, specify _____

_____

_____

_____

_____

_____

If pharmacy service is provided through some outside drug store or pharmacy, please answer questions 3 and 4. Otherwise, go on to question 5.

3. How many hours does the retail pharmacist spend *in* the hospital per week?
(Check one) [I:18]

___ None at all

___ Less than 5 hours

___ 5 - 9 hours

___ 10 - 14 hours

___ 15 - 20 hours

___ Over 20 hours

4. How satisfactory do you think your present pharmacy arrangements are with the retail pharmacist?

	(Check one) [I:19] For the patient	(Check one) [I:20] For the hospital
Very satisfactory	____	____
Satisfactory	____	____
Only somewhat satisfactory	____	____
Not too satisfactory	____	____
Not satisfactory at all	____	____

4a. If it were possible to make a change in your present arrangement, would you change it? [I:21]

Yes ___ No ___

4b. If yes, what changes would you make? [I:22] ____

_____

_____

_____

_____

_____

_____

4c. What are the major problems which make it difficult for you to make such changes? [I:23] ____

_____

_____

_____

_____

_____

_____

_____

_____

If pharmacy service is provided in your hospital by personnel other than a pharmacist, please answer questions **5** and **6**. Otherwise, go on to question **7**.

5. Who is assigned to perform duties in the pharmacy or drug room?

(Fill in as many as applicable)

	How many full time	How many part time	Total
Nurse	____ [I:24]	____ [I:25]	____ [I:26]
Helper, Aide, Technician, etc. . .	____ [I:27]	____ [I:28]	____ [I:29]
Other, specify ____	____	____	____
Total	____ [I:30-31]	____ [I:32-33]	____ [I:34-35]

5a. If there are *only part time* personnel assigned to the pharmacy, about how many hours are spent on pharmacy service per week?

(Check one) [I:36]

___ Less than 5 hours

___ 5 - 9 hours

___ 10 - 14 hours

___ 15 - 19 hours

___ 20 - 29 hours

___ 30 hours or over

6. How satisfactory do you feel your present arrangement for pharmacy service is?

	(Check one) [I:37] For the patient	(Check one) [I:38] For the hospital
Very satisfactory	____	____
Satisfactory	____	____
Only somewhat satisfactory	____	____
Not satisfactory at all	____	____

6a. If it were possible to make a change in your present arrangement, would you change it? [I:39]

Yes ___ No ___

6b. If yes, what changes would you like to make? [I:40]

6c. What are the major problems which make it difficult for you to make such changes? [I:41]

7. Do you have a pharmacy or drug room in your hospital? (By this we mean a designated area where drugs are centrally stored for future distribution throughout the hospital.) [I:42]

   Yes ___ No ___

   7a. How many square feet of space does this room or area occupy? [I:43-46]

   _____sq. ft.

8. What would you estimate your present drug inventory to be? [I:47-49] $_____

9. How much did your hospital spend for drugs (including I.V. fluids) last year? [I:50-52] $_____

10. Is there an active pharmacy and therapeutics committee in your hospital? [II:15]

    Yes ___ No ___

    10a. How many meetings were held last year? [II:16-17]

    _____

11. Has your hospital adopted:

    (Check one) [II:18]

    ___ A formulary developed in your hospital or hospital group

    ___ Another hospital's formulary

    ___ A drug list

    ___ None of these

12. Under your present set-up, which of the following pharmacy activities are carried out by the person responsible for pharmacy service in your hospital?

	Check if these are now being carried out	If not, check if you would like to have these services carried out by a pharmacist
Filling prescriptions for in-patients [II:19]	___	___
Filling prescriptions for discharge and clinic patients [II:20]	___	___
Compounding or preparing special prescriptions, solutions, and other drug products [II:21]	___	___
Purchasing and maintaining adequate inventory stock of all drugs used by the hospital [II:22]	___	___
Controlling and handling of all narcotics [II:23]	___	___
Providing drugs in ready to use form to nursing units, operating rooms, clinics and other departments [II:24]	___	___
Cooperating in developing safe procedures for handling drugs in the hospital [II:25]	___	___
Providing drug information service to medical, nursing and allied professional staffs [II:26]	___	___
Working with nursing department in setting up stocks of drugs for use on nursing divisions [II:27]	___	___
Inspecting drugs on nursing units regarding proper storage, expiration dates, deterioration, etc. [II:28]	___	___
Conferring with medical staff concerning selection of drugs to be stocked in the pharmacy [II:29]	___	___
Maintaining proper control procedures and records of the business aspects of the pharmacy [II:30]	___	___

The statistical information requested in Questions 13, 14 and 15 is the same as that requested each year by the American Hospital Association. You may therefore give the same figures which you supplied on the last questionnaire from the A.H.A.

13. Please check the following data regarding the type and size of your hospital.

Length of Stay

(Check one) [II:31]

Short-term (Average stay 30 days or less) .. ____

Long-term (Average stay over 30 days) .. ____

Type of Service

(Check one) [II:32]

General ..... ____

Special ..... ____

Size (bed capacity excluding bassinets)

(Check one) [II:33]

1 - 24 beds ..... ____

25 - 49 beds ..... ____

50 - 99 beds ..... ____

100 - 199 beds ..... ____

200 - 299 beds ..... ____

300 - 399 beds ..... ____

400 - 499 beds ..... ____

500 beds or over ..... ____

Ownership

(Check one) [II:34-35]

Governmental, non-federal

City ..... ____

County ..... ____

City-County ..... ____

State ..... ____

Hospital District ..... ____

Governmental, Federal

Army ..... ____

Navy ..... ____

Air Force ..... ____

Public Health Service ..... ____

Veterans Administration ..... ____

Other Federal ..... ____

Non-Governmental

Church, specify denomination _____ ____

Community ..... ____

Fraternal order ..... ____

Private, not for profit ..... ____

Private, for profit ..... ____

14. How many in-patient admissions did your hospital have last year?[II:36] _____

14a. How many patient days per year?[II:37-39] _____

15. How many out-patient visits did your hospital have last year?[II:40-42]

Total visits _____.

15a. Of these, what percentage were private visits.[II:43]

_____ %

(*See next page*)

16. We would appreciate any comments you wish to make regarding any aspect of pharmacy service in your hospital.[II:44]

Appendix C

Audit of Pharmaceutical Service in Hospitals

AMERICAN PHARMACEUTICAL ASSOCIATION AND AMERICAN SOCIETY OF HOSPITAL PHARMACISTS

DON E. FRANCKE
program director
CLIFTON J. LATIOLAIS
assistant director
University Hospital
Ann Arbor, Michigan
phone: NO 2-2873

August 1960

SUPPLEMENTARY QUESTIONNAIRE

Please fill out and return in the enclosed, stamped envelope. Thank you.

1. How many hours per week do pharmacists regularly work at your hospital? (Check one)

Less than 40 hrs. . . ____
40 hrs. . . . . ____
44 hrs. . . . . ____
48 hrs. . . . . ____
More than 48 hrs. . . ____

2. In what department of your hospital are the following sterile solutions prepared? Check as many as apply.

		PREPARED IN		
	Not Prepared in Hospital	Pharmacy	Central Sterile Supply	Other Department (State which)
Large volume injectable solutions (bulk intravenous fluids). . . .	_____	_____	_____	_____
Small volume injectable solutions (ampuls, vials, procaine, etc.).	_____	_____	_____	_____
Sterile solutions for topical use (wet dressings, irrigations)...	_____	_____	_____	_____

3. Is the Chief Pharmacist at your hospital:

(Check One)
Male. . . . . ____
or
Female. . . . . ____

(Check One)
Member of religious order (Sister,etc.) . ____
or
Not a member of religious order . . . . . ____
(not a Sister, etc.)

--PLEASE FILL OUT NEXT PAGE ALSO--

SUPPLEMENTARY QUESTIONNAIRE, Page 2

4. Is it your general policy to fill prescriptions for <u>outpatients</u> (ambulatory or nonhospitalized patients) in your hospital? (Check one)

Yes_____ No_____

<u>If yes</u>, please answer the following; <u>if no</u>, go to question 5.

a. How many outpatient prescriptions did you fill last year? (Your last calendar year, or your fiscal year '59-'60) . . . . . _____

b. How many outpatient prescriptions did you fill in 1957? (Your 1957 calendar year, or your fiscal year '56-'57) . . . . . _____

c. Approximately what percentage of the outpatient prescriptions which you fill are for:

Indigent or partially indigent . . . . . _____

Private pay patients . . . . . _____

Other, please list _____

_____ . . . _____

d. Do you fill both inpatient and outpatient prescriptions in the same pharmacy location, or do you have a different location, physically separated, where you fill outpatient prescriptions:

Inpatient <u>and</u> outpatient prescriptions are filled in the same location or unit of the pharmacy. . ._____

Outpatient prescriptions are filled in an outpatient pharmacy which is separated physically from the inpatient pharmacy. . . . . ._____

If other than the above, please write in your method:

_____

_____

_____

_____

5. How many beds, excluding bassinets, does your hospital have?. . . . ._____

Appendix D

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
WASHINGTON 25, D. C.

IN REPLYING, ADDRESS THE
PUBLIC HEALTH SERVICE

REFER TO: HF:C

August 22, 1955

Robert P. Fischelis, Secretary
American Pharmaceutical Association
2215 Constitution Avenue, N. W.
Washington 7, D. C.

Dear Mr. Fischelis:

In July of 1950, your organization submitted an application for a grant-in-aid for a "Professional and Administrative Audit of Pharmaceutical Service in Hospitals." No action was taken on your application because no funds were appropriated for this purpose. Congress has appropriated $1,200,000 for the fiscal year 1956 for such grants, demonstrations and research purposes.

Should you still be interested in submitting your application for reconsideration, please let us know. In that event, as soon as the application form is developed, it would be forwarded to you so that a request for such research or demonstration might be submitted for formal consideration. You would be advised of the action taken after your application had been considered by the Study Section and Federal Hospital Council.

Sincerely yours,

/S/ John W. Cronin

John W. Cronin, Medical Director
Chief, Division of Hospital and
Medical Facilities

Appendix E

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
WASHINGTON 25, D. C.

IN REPLYING, ADDRESS THE
PUBLIC HEALTH SERVICE

REFER TO: HF:RG
W-45

December 21, 1955

Mr. Don E. Francke
Director, Division of Hospital Pharmacy
American Pharmaceutical Association
2215 Constitution Avenue, N. W.
Washington 7, D. C.

Dear Mr. Francke:

Upon recommendation of the Federal Hospital Council on December 16, 1955, the Surgeon General has approved your application for a research grant, No. W-45. The amount, period, and recommendation in reference to additional years of support are specified for this grant on the attached Statement of Research Grant Award. This grant has been approved for one year with the understanding that a new application for continuation will be given full consideration. You may obligate these funds at any time after the beginning date shown on the Statement of Award, even though check in payment may be delayed several weeks.

It is important for you to note that under Public Health Service policy, a grantee is not required to follow the specific details of the project submitted for review, particularly if he finds promising leads that in his opinion are likely to be more productive than the project proposal itself.

I trust that these funds will facilitate your research and that if I may be of further service, you will not hesitate to let me know.

Sincerely yours,

/S/ John W. Cronin

John W. Cronin, Medical Director
Chief, Division of Hospital and
Medical Facilities

Appendix F

BULLETIN

from the **American Pharmaceutical Association,** 2215 Constitution Ave., Washington 7, D. C.—a national, non-profit, professional body of pharmacists, pharmaceutical educators, law enforcement officials, research workers, and others interested in the protection of public health and the prevention and treatment of disease.

February 2, 1956

A.PH.A. RECEIVES RESEARCH GRANT FOR HOSPITAL PHARMACY STUDY

The American Pharmaceutical Association has been named the recipient of a $36,000 grant from the United States Public Health Service for the purpose of carrying out an audit of pharmaceutical services in hospitals. This is one of eleven research grants made from an appropriation of $1,200,000 included in funds for the Hospital Survey and Construction Program. Projects for which grants were approved by the Federal Hospital Council include the evaluation of methods for improving patient care, study of the kinds of hospital services needed by a community, and the effect of laws governing hospital planning and licensing.

This project to be carried out under the direction of the Division of Hospital Pharmacy of the American Pharmaceutical Association and American Society of Hospital Pharmacists will seek to fill an urgent need to determine what constitutes good pharmaceutical service for patients in hospitals of various sizes and types. A preliminary pilot study will first be made on a regional basis and from analysis of the facts determined, an evaluation standard will be developed for additional regional studies.

The specific objectives of the audit as outlined in the application to the Public Health Service are: (1) To determine the elements required to perform the pharmaceutical service as established by the facts obtained in the survey; (2) To improve the pharmaceutical aspects of medical care for the hospital patient; (3) To provide essential pharmaceutical service to the hospital and the medical and allied staffs; (4) To establish a standard of pharmaceutical practice for hospitals of various sizes and types. Immediate plans are under way for selecting personnel and setting up the machinery for carrying out the study. It is anticipated that the facts acquired in the study will have a tremendous effect on hospital pharmacy practice in the United States and will also be the basis for providing better pharmaceutical services for patients in hospitals.

The Division of Hospital Pharmacy was organized in 1947 as an administrative unit to coordinate activities of the American Pharmaceutical Association and the American Society of Hospital Pharmacists in developing better pharmaceutical service in hospitals. Both organizations have contributed immeasurably toward establishing and implementing standards for pharmacy practice and providing services in the field of hospital pharmacy. The grant made by the Public Health Service will offer an opportunity to extend the work of the Division and serve as a guide to future activites in this field.

Robert P. Fischelis, Secretary

Appendix G

The CATHOLIC HOSPITAL ASSOCIATION
OF THE UNITED STATES AND CANADA
Executive Offices
1438 SOUTH GRAND BOULEVARD
SAINT LOUIS 4, MISSOURI
PHONE. PROSPECT 3-0646-7-8

October 2, 1956

Mr. Don E. Francke
University Hospital
1313 E. Ann Street
Ann Arbor, Michigan

Dear Don:

This is to acknowledge your letter of September 27 concerning the research project "Audit of Pharmaceutical Service in Hospitals." I am very glad to receive this.

Certainly our group wishes to get behind this work. My first reaction when I heard of this project was that it would set a new pace from which all future activity on behalf of Hospital Pharmaceutical Service could be measured. I am convinced that your study will provide the much needed basic information to move forward.

I shall be most glad to bring this to the attention of our Committee and strongly recommend that they get behind this undertaking. I would greatly like to have a copy of the questionnaire as soon as it is available.

Sincerely,

/S/ M. R. Kneifl

M. R. Kneifl
Executive Secretary

Appendix H

News Release

Audit of Pharmaceutical Service in Hospitals

AMERICAN PHARMACEUTICAL ASSOCIATION AND AMERICAN SOCIETY OF HOSPITAL PHARMACISTS

For Publication in National, State or Regional Hospital Publications

Ann Arbor, Michigan, December 15, 1956 - A study designed to determine how pharmacy service is being provided to patients in the nation's hospitals is now under way. Hospital pharmacists themselves have shown the growing problems in providing a total pharmacy service and have pointed out the need for a study of this type. This need is the result of not only increased utilization of hospital facilities but also the continuing increase in the number and extent of use of drugs over the past decade. These factors alone have had a tremendous effect on the handling of drugs for hospital patients.

This is the first comprehensive, national study of pharmaceutical service in hospitals undertaken in the United States. It is being carried out under a grant from the U. S. Public Health Service by the Division of Hospital Pharmacy of the American Pharmaceutical Association and the American Society of Hospital Pharmacists. Members of the Society and the 45 affiliated chapters throughout the country will be called on for cooperation and full support. The study also has the endorsement of national hospital associations.

This study is being carried out to obtain useful data, such as the type of services and functions available and the facilities, space and personnel needed to perform these activities in hospitals of various sizes and types.

To obtain this information and fulfill the objectives of the study, the investigators will (1) examine present methods of pharmaceutical practice and service in hospitals; (2) outline the elements of pharmaceutical service which will promote better patient care; (3) determine how these elements of service may be more effectively performed for the benefit of the patient, the medical and allied staffs, and the hospital; (4) consider the education and training desirable for hospital pharmacists to enable them to perform these elements of service; and (5) recommend a plan of action for the implementation of the findings of the Survey.

(More)

News Release, December 15, 1956

The collection of data on hospital pharmacy practice will involve the use of mail questionnaires, personal interviews and case studies. The scientifically selected sample comprises 3,500 hospitals, sub-divided according to size and type of service. This method will provide statistical data for these different sizes and types of hospitals, as well as for all hospitals in general.

The need for improving the quality and expanding the scope of pharmaceutical service in the nation's small hospitals is being given particular attention. The fact that this group makes up more than half of the hospitals in the United States points up the importance of studying the particular problems facing the small hospital regarding pharmacy service.

Successful completion of the Survey of Pharmaceutical Service in Hospitals will provide factual data which will serve as a basis for improving the quality and expanding the scope of pharmaceutical service to patients. It will also help to establish standards of procedure in keeping with modern hospital practice and enable better economic planning in the integration of pharmaceutical service with hospital administration and professional services in general.

The Survey is being carried out under the direction of Dr. Don E. Francke, Chief Pharmacist at University Hospital, Ann Arbor, Michigan, in cooperation with the Survey Research Center at the University of Michigan. Mr. Clifton J. Latiolais, formerly Chief Pharmacist at Strong Memorial Hospital in Rochester, New York, is Assistant Program Director.

- End -

Appendix I

American Hospital Association
18 EAST DIVISION STREET · CHICAGO 10, ILLINOIS

March 11, 1957

Dr. Robert P. Fischelis, Secretary & General Manager
American Pharmaceutical Association
2215 Constitution Avenue, N. W.
Washington 7, D. C.

Dear Doctor Fischelis:

It is my pleasure to inform you that on February 6, 1957, the Coordinating Committee and Board of Trustees of the American Hospital Association voted:

> "To endorse in principle the survey to be conducted by the American Pharmaceutical Association, known as the Audit of Pharmaceutical Service in Hospitals, further
>
> "To urge member hospitals of the American Hospital Association to cooperate in this study."

Sincerely yours,

/S/ Edwin L. Crosby

Edwin L. Crosby, M.D.
Director

Appendix J

American Hospital Association
18 EAST DIVISION STREET · CHICAGO 10, ILLINOIS

July 19, 1957

Dear Administrator:

An important study now being carried out in the hospital field is the Audit of Pharmaceutical Service which is described in the enclosed letter. One phase of the study is directed to hospital administrators and your cooperation in completing the questionnaire will be a contribution toward improving our knowledge of pharmaceutical services in the nation's hospitals.

The American Hospital Association has endorsed the audit and we urge member hospitals to give complete cooperation to the study. It is anticipated that the ultimate result of this project will be improved pharmaceutical services in hospitals and better patient care.

Sincerely,

/S/ Edwin L. Crosby

Edwin L. Crosby, M.D.
Director

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