

PROJECTION OF STAFF AND SPACE REQUIREMENTS

FOR THE PHARMACY DEPARTMENT

University of Minnesota Hospitals

December 1967

The role of the pharmacy department is to assist in providing the best patient care, to provide drug control throughout the hospital, provide and assist in professional educational programs, and participate and assist in research efforts.

OBJECTIVES

1. Improve outpatient care through efficient use of personnel, equipment and physical facilities.
2. Improve inpatient care through efficient use of personnel, equipment and physical facilities.
3. Provide a more efficient bulk compounding and prepackaging operation.
4. Improve drug control and purchasing procedures within the pharmacy department.
5. Improve drug control throughout the hospital.
6. Strengthen the professional contribution by the pharmacy through the availability of educational programs for pharmacy personnel.
7. Maximize professional pharmacy services through improved inter-departmental relationships with the nursing staff, the medical staff and the college of pharmacy.
8. Recruit and maintain well qualified staff in the pharmacy.
9. Develop and assist in research projects.

This report is a composite of the two earlier reports presented in March and May, 1967. The purpose, objectives, and roles of the pharmacy department have been restated. The staff and space requirements presented are those necessary for the department to become a leader in the hospital pharmacy field.

The projection of space requirements for the 1008 patient hospital was difficult because the present space is very inadequate, both in size and physical layout, and because many new activities are being added. The estimates that are being submitted for space and staff requirements for the Pharmacy are based on the following studies performed in other hospitals that are research oriented:

"Medical Education Facilities- Planning Considerations and Architectural Guide." Public Health Service Publication #1180-A016, 1964.

"Estimated Floor Space Allocation," University of Arkansas, 1966.

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"A Study of Patient Care Involving a Unit Dose System," College of Pharmacy, University Hospitals, University of Iowa, 1967.

The new proposed pharmacy curriculum has included a training program with a clinical setting. This institution would be utilized by the College of Pharmacy for this program. The college now estimates classes of 140 students within the next ten years. If we are to provide faculty and facilities for the proposed clinical teaching program, a considerable amount of additional space and professional personnel will be needed. The advance degree training program in hospital pharmacy will have to be extended further.

The first report submitted by the Pharmacy Department on the projection of staff and space requirements needed for the new hospital consisted of three approaches. Since that time the pharmacy has been in a state of rapid progression and has redefined its inpatient dispensing concept. The new approach consists of a combination of the three approaches as outlined before.

Inpatient dispensing will be divided between a central pharmacy and outlying satellites. There will be nine satellites, one servicing each of the different hospital areas i.e.-surgery, medicine, psychiatry, pediatrics, orthopedics, OB-Gyn, Masonic hospital, Heart hospital and Rehabilitation. It has been estimated by hospitals utilizing this system that one satellite can efficiently service 120 beds. The satellite pharmacy should be centrally located and adjacent to the areas of service.

The satellite system places the pharmacist into a close working association with the nurse and the physician. This enables him to be readily available for information and to perform tasks requiring the skill of a pharmacist. Many of these tasks are those which nursing has been forced to assume through the years. Placing the pharmacist in the working environment of the nursing station improves patient care.

A unit dose system of dispensing medications will be adopted with the satellites. This will eliminate the need for the traditional medication rooms on the nursing station. In this system medications are delivered from the central pharmacy, then stored and administered from a locked cart, a medicine cupboard in the patient's room, or some other acceptable system.

The satellite should be physically placed adjacent to the nursing stations being served. The space requirements will be needed to allow for emergency I.V. additive service, room for inservice training of students from the College of Pharmacy, and all routine pharmacy services needed by nursing.

The above personnel will also be available for the other educational activities within the hospital. Some of the activities that would be included are orientation of new professional personnel, a closer relationship with the nursing staff, and a program to enable a pharmacist to become a part of the medical rounds on the nursing stations to serve as a source of drug information.

OBJECTIVE #1:

To improve outpatient care through efficient use of personnel, equipment and physical facilities.

- A. Through the proper location and layout of the physical facilities the outpatient care can be improved.
 - 1. The pharmacy service should be conveniently located adjacent to the outpatient clinics.
 - 2. There should be convenient access to the street and or garage.
 - 3. The waiting room should be adjacent to the pharmacy, well lighted and served by a public address system.
 - 4. Consultation booths should be provided in which the pharmacists may present the completed prescriptions to the patient and discuss any problems related to the use of the medications.
- B. To develop a clinical environment program for students in the College of Pharmacy.
 - 1. Professional personnel should be capable of serving as teaching assistants in the instruction program involving dispensing procedures and patient consulting.
 - 2. To provide exemplary physical facilities, equipment and procedures.
- C. To develop a pharmacy service closely allied with the teaching, research and service mission of the outpatient clinics.
 - 1. Further development of a professional fee system for pricing prescriptions on the basis of the cost of providing the service should be accomplished.
 - 2. To develop a patient medication profile system.
 - 3. To provide pharmaceutical and pharmacological reference and consultation to the medical staff and students.
 - 4. To contribute to research by expanding the following services.
 - a. Investigational drug control systems.
 - b. Facilities for extemporaneous preparation of unusual medications and dosage forms

The primary function of the Outpatient Pharmacy is that of providing a complete pharmacy service to outpatients. Secondly, to make available a training program in the clinical environment for pharmacy students. And finally to develop a pharmacy service closely allied with the teaching, research, and service mission of the Outpatient Clinics. The department should be well planned to serve these purposes.

To assist in departmental organization the area should be divided into functional segments including:

1. Patient reception area
2. Patient consultation area (presentation of the completed prescription by a pharmacist)
3. Phone service and drug information desk
4. Dispensing units
5. Compounding area for:
 - a. Ointments
 - b. Solutions
 - c. Sterile products
 - d. Powders
 - e. Biologicals
 - f. Allergens
 - g. Bulk Solutions
6. Labeling and clerical tasks
7. Office space
8. Packaging and mailing
9. Prescription and patient medication profile storage
10. Storage of additional patient supplies (various measuring devices, syringes, needles, bandages, etc.)
11. General storage space
12. Clean up area

This service will provide a first contact with the clinical aspects of the practice of pharmacy for many students.

It is important that the student in his practical training be confronted with and taught correct, professional, and efficient pharmacy techniques. For this reason, emphasis should be placed on the potential of this department as a training area for future pharmacists who will be serving all types of pharmacies.

The dispensing area should be composed of segregated modular units, each unit adequate for a pharmacist-student working team. The arrangement of the pharmacy should be conducive to undisturbed concentration of duties; designed to be quiet with the pharmacists in full view but separated from the reception and consultation areas. A separate area will be needed for various compounding functions. A small laminar flow hood supplied with suction, gas and compressed air will be needed for extemporaneous compounding of sterile medications. Refrigeration must be available for the storage of supplies needed for prescription dispensing and the storage of medications and biologicals to be administered in the Clinics. Limited freezer space will be needed for biologicals requiring such storage.

The proposed individual patient medication profile would place on file the contents of prescriptions prescribed in the past, current drug therapy, drug sensitivities and allergies. Clerical personnel will be required to record, maintain and file these records. Additional space will be needed for filing facilities.

As a contribution to the investigational drug studies being conducted within the clinics, the pharmacy should be adequately equipped to procure, store, and record the disposition of these medications. The compounding areas should be designed with the capabilities for the extemporaneous preparation of unusual medications and dosage forms which may be required for research studies and are not commercially available.

OBJECTIVE #2:

Improve inpatient care through efficient use of personnel, equipment and physical facilities.

- A. Development of satellite pharmacies to provide a more complete service to the nursing stations.
- B. To develop a system to provide the pharmacy with a copy of the original orders as written by the physician.
 - 1. This will allow the pharmacy to develop a medication profile for each patient.
 - 2. This will provide pharmacy with information to determine prescribing practices of the physicians and allow pharmacy to adjust their dispensing pattern to better coincide with present prescribing patterns.
- C. Development of a unit dose dispensing system for all medications used in the hospital.
- D. To hire and train well qualified pharmacists.
 - 1. To work with the medical staff and nursing staff on the satellites.
 - 2. To provide a 24-hour coverage.
- E. Development of an intravenous solution additive program performed by the pharmacy to eliminate almost all mixing of parenterals by nursing personnel. To have this system work properly, 24-hour coverage will be needed in the central pharmacy. The results of this program will be improved patient care.
- F. To cooperate with the nursing and medical staffs to develop a uniform emergency medication cart or tray.
- G. Development of an abridged hospital formulary using the present American Hospital Formulary system as a guide.

The satellites located on the medical and surgical areas will require more space (450 sq. ft.) than those servicing the other areas (300 sq. ft.) Each nursing station will need to be large enough to allow a pharmacist to consult with the physician and nurse or to read the patient's chart for additional information. This can be common space on the nursing station.

The satellites will be manned by personnel from pharmacy sixteen hours per day (two shifts). Satellites needing assistance during the remaining eight hours will utilize the pharmacist in the central pharmacy which will be open twenty-four hours a day. During the evening shift it may be possible, depending on physical location of the hospital areas, to cover two satellites with one person. The busy areas such as surgery, medicine and Masonic hospital will need one person to cover each satellite. Sixteen hours of pharmacy coverage is necessary on the satellite. The work load on the many nursing stations does not decrease substantially at 5 p.m. due to late doctors rounds, new admissions, changed orders etc. Those areas having a decreased work load have been regrouped and are serviced by three satellites instead of six.

The following is a list of personnel needed for the satellites. Nine pharmacists for coverage during the day. Three additional pharmacists are needed to rotate with the other nine to cover days off, weekends and holidays. The evening shift will require three pharmacists to cover the six remaining areas. Two pharmacists will be needed to rotate with these people for coverage on days off, weekends and holidays.

With the expansion of the residency and internship program, these people can be utilized to assist the pharmacist during the day shift and help fill in on the evening shift.

The central pharmacy will become the packaging and storage area from which all medications (in designated sizes) will be supplied through the satellite system when needed by the nursing stations.

The amount of space presently utilized by the dispensing area in the central pharmacy is inadequate. It has been estimated that six registered pharmacists will be needed to rotate through two shifts, seven days a week, holidays inclusive. Two additional pharmacists will be needed for coverage on the night shift, providing twenty four hour coverage.

OBJECTIVE #3:

Provide a more efficient bulk compounding and prepackaging operation.

- A. Utilization of more non-professional personnel to perform routine functions under supervision. This would enable the professional personnel to better utilize their training and abilities in more specialized functions.
- B. Expansion of a bulk compounding program with proper controls.
 - 1. Non-sterile manufacturing facilities need to be improved and expanded to provide a more economical means of bulk compounding and packaging.
 - 2. To provide a sterile manufacturing and packaging service, the pharmacy needs a clean room and sterile work area.
- C. Expansion of the prepackaging function to include more non-sterile and sterile items now being packaged on an individual basis.

The main function of this area is to provide the necessary products for the dispensing services of the pharmacy. An additional function will be to utilize this area as a teaching facility for graduate and undergraduate pharmacy students.

Sterile bulk compounding, nonsterile bulk compounding, prepackaging, and clean-up are the four basic activities included in this area of pharmacy. To efficiently utilize personnel, equipment, and space, these areas should be adjacent to one another.

Two pharmacists will be responsible for the teaching function and the overall operation of these areas. One pharmacist will be responsible for the non-sterile compounding and packaging activity. The second pharmacist will be responsible for the sterile compounding and packaging activity. Nonprofessional personnel, under the supervision of a non-professional supervisor, will do the majority of the work in this area. This personnel can be shifted from one work area to another depending upon the work schedule in each area.

Equipment such as water stills and reservoirs, label printing and dispensing machines, and other packaging equipment can be shared by all four work areas, thus reducing duplication of equipment.

The total requirement for space can be reduced by having a common storage area for equipment, bulk chemicals and packaged medications. As the scope of this area changes the storage area can be rearranged to accomodate this change, without extensive remodeling.

STERILE AND NON-STERILE BULK COMPOUNDING

To provide an efficient bulk compounding area it will be necessary to greatly increase the working and storage area. There is a need to purchase more and larger equipment to enable us to produce items in economical quantities. If this is done, a much larger area will be needed to provide adequate storage for raw materials, as well as the finished products. An area will be needed for new and larger stills and reservoirs to provide an adequate supply of water for the compounding areas.

In the sterile compounding area there will be a need for space for a "clean" room. Large equipment, such as Laminar Flow Hoods, mixing tanks, and packaging equipment will require additional space. Because of the wide range of sizes and types of containers that will be packaged in this area there will be a need to have certain areas that are to be used for specific activities. If the pharmacy is not adjacent to the Central Supply area there will need to be an additional area for an autoclave. Outlets for gas, vacuum and compressed air will be needed in this area.

PREPACKAGING

This program is being expanded rapidly. Prepackaging has been expanded to include sterile solutions as well as oral products for dispensing in the inpatient and outpatient service areas. Further expansion of the operation is dependent upon having a larger work area and also a much larger storage area. Because of congestion, prepackaging is now done in several areas. To make this a more efficient, better controlled operation it should be done in one central area with optimal working conditions for the employees. The prepackage area should be adjacent to the bulk compounding area because many of the products that are made in the pharmacy are prepackaged before they are dispensed.

With the development of the use of unit dose medication, the scope of the prepackaging area will change. As the availability of these products increase and the cost per unit decreases it may be necessary to package only those items that are not commercially available. It is not conceivable that unit dose packages will be utilized for outpatient dispensing, therefore this part of the operation will remain unchanged. The storage space presently used for prepackaged medications will have to be expanded considerably to provide adequate space for storage of unit dose packages.

CLEAN-UP AREA

The bottle washing area will need to be larger to accommodate its entire function. There must be a separate area for the storage of dirty bottles and equipment, for the cleaning of bottles and equipment for wrapping clean equipment and supplies for autoclaving, and an adjacent storage area for clean bottles and equipment and other supplies.

OBJECTIVE #4:

Improve drug control and purchasing procedures within the pharmacy department.

A. Development of a Control Laboratory

1. To provide a means for assaying and controlling all items that are manufactured or packaged in the pharmacy department.
2. To provide a means for testing the quality of drugs and chemicals purchased by the pharmacy department.
3. To provide facilities and personnel for developing special dosage forms, when they are required.

B. Purchasing and Storage

1. Improve purchasing procedures by utilizing electronic data processing equipment.
2. To have proper and adequate storage facilities for all chemicals and medications stored in the pharmacy.

CONTROL LABORATORY

A control laboratory is an essential part of a pharmacy operation with the diversity of this department. It is of prime concern that this area be established as soon as possible.

Besides a paper check, it is necessary to do a chemical check of all products that are made in the department in addition to the raw chemicals and drugs that are procured. A chemist would be responsible for the actual tests and assay work done in this area. The pharmacist responsible for this area could serve as a supervisor as well as instructor in the college of pharmacy. If the facilities and the equipment were shared with the college of pharmacy this area could be utilized for research by graduate students in addition to the routine assay work.

PURCHASING AND STORAGE

The main requirement in this area is the need for proper and adequate storage facilities to permit the development of an efficient purchasing procedure. The development of a Data Processing inventory system will permit a nonprofessional to handle the routine ordering and to provide adequate controls of the chemicals and medications.

A large area will be needed for the centralized storage of most items used in the pharmacy. This area should be adjacent to the in-patient pharmacy and the compounding and prepackaging area to enable all storage to be centralized in one area. In addition to the main storage area the following special areas are required:

1. A properly vented and constructed area is needed for the storage, pouring, and packaging of volatile liquids. If possible, this area should be adjacent to the nonsterile bulk compounding area.
2. A large walk-in refrigerator is needed in the central storage area for the storage of all items requiring refrigeration. There must be refrigeration space in each of the dispensing areas and on the satellite pharmacies.
3. Adequate storage will be needed for all records. A space-saver process i.e., microfilming, if used in all possible areas would eliminate the need for some of the area allotted for this type of storage.
4. A large walk-in vault for storage of stock supplies of narcotics, and barbiturates, and other controlled drugs.

OBJECTIVE #5:

Improve drug control throughout the hospital.

- A. To play an active role in the functioning of the pharmacy and therapeutics committee and the formulary system.
- B. To centralize and control the dispensing of investigational drugs and providing information pertaining to them in the pharmacy.
- C. To develop more efficient methods for dispensing narcotics and barbiturates would be accompanied by better controls for these drugs.
- D. To provide controls on supplies and medications stored on the nursing stations.
 - 1. Expansion of the present Automatic Stock Replacement System to the Operating Room, Recovery Room, Urology, and the clinics and possibly expand the items now under this system.
 - 2. Further development of the Intravenous Fluid Automatic Replacement System on the stations. It is presently in operation on a trial basis on nine stations. Changes may be necessary in the system before it is expanded further.

PHARMACY AND THERAPEUTICS COMMITTEE

It is important for the pharmacy to be active in the Pharmacy and Therapeutics Committee. This committee approves or deletes medications that are to be included in the formulary. This type of control reduces the number of medications that are stocked by the pharmacy, thus reducing inventory costs, storage space, and the time needed to maintain adequate stocks. Utilizing a formulary system of drug control, a more select group of drugs having similar action are stocked. This enables purchasing of larger quantities, better utilizing the bid system of purchasing and further reducing the cost of the medication to the patient.

INVESTIGATIONAL DRUGS

The pharmacy is equipped to handle the necessary controls and records for a well controlled investigational drug program. In handling investigational drugs centrally, all supplies can be dispensed from a central source and all inquiries concerning them can be handled through one location. Many inquiries are now made at the pharmacy concerning these drugs, their location, their use, precautions, investigators, etc. Many times pharmacy is unable to answer these questions because the material and information is not made available. At present a secretary is utilized in many areas to control these drugs. Under a central control system, a pharmacist would always be available to dispense the needed medication. He is also equipped to answer questions concerning possible side effects and precautions. This would eliminate the present confusion created by the poorly organized decentralized system now being utilized.

NARCOTICS AND BARBITURATE CONTROLS

The present system of handling narcotics and barbiturates which has been adopted within the last year has simplified the task required of nursing to account for station stock narcotics and barbiturates, thus reducing the chance for error. Further changes in this system will be determined by the development of the satellites and the unit dose system. The final form of the system will probably require a different type of storage area on the nursing stations.

CONTROL OF NURSING STATION STOCK

The satellite pharmacy program will provide more control of medications on the nursing station. Until all areas are serviced in this manner, staff pharmacists will make routine station visits to check the storage and use of medications and discuss any problems with the head nurse for this area.

The following programs have been initiated to improve the control of floor stock and intravenous solutions stored on the nursing stations.

1. Automatic Stock Replacement - This activity will remain about constant allowing only for the increase in the number of nursing stations serviced. This is primarily handled by nonprofessional personnel. The space requirements on the nursing stations is approximately fifteen linear feet of shelf space. The storage space in the pharmacy is included in the prepackage storage area requirements.
2. Intravenous Fluid Automatic Stock Replacement- Initially this activity will be used to supply the individual nursing stations. When the I.V. additive program is established this system will be modified to restock the area or areas where the solutions are being prepared. The work will be handled by nonprofessional personnel.

OBJECTIVE #6:

Strengthen the professional contribution by the pharmacy through the availability of educational program for pharmacy personnel.

- A. Expand the graduate hospital pharmacy residency program.
 - 1. Further develop a manual and schedule for the program.
 - 2. Expand the scope of the program.
- B. Expand the training program for pharmacy interns.
- C. Provide adequate office space for the administrative personnel.

The expansion of the residency and internship programs will be beneficial to the pharmacy department as well as the pharmacy profession. This type of program provides the department with a ready source of eager qualified professional personnel. The students in these programs will be able to work along with the registered pharmacists as part of their training. In many cases it will be possible to cover an area with a pharmacist and an intern or resident rather than a second pharmacist. Because of this, each pharmacist will be able to service a larger area i.e., such as in the satellite pharmacy program.

A central office area is desperately needed for the Chief and Assistant Chief pharmacists and supporting clerical personnel. Office space will be needed in other areas of the pharmacy to provide a work and record storage area for the supervisor in these areas.

A conference room located adjacent to the central office is necessary for conducting intradepartmental conferences and meetings and for small interdepartmental meetings or classes. This area could also be utilized for administrative associated activities that will be performed by non-professional personnel, i.e. Hospital Formulary supplements, pharmacy newsletter, etc.

OBJECTIVE #7:

Maximize professional pharmacy services through improved interdepartmental relationship with the nursing staff, the medical staff, and the college of pharmacy.

- A. Establish a drug information center
 - 1. Must be accessible to the pharmacy staff, medical staff, nursing and other interested personnel of the hospital.
 - 2. Should serve as a poison control center for the hospital as well as for the entire community.
 - 3. Would contain information concerning medication available on the market and those listed in the hospital formulary.
 - 4. Must be staffed by a pharmacist or a pharmacologist 24 hours a day to be effective.
- B. Establish a better means of communication between the Pharmacy staff and the medical and nursing staff.
 - 1. Conduct an orientation for all new nursing staff, interns, residents, and all other interested medical staff to the policies of the pharmacy.
 - 2. Develop inservice educational programs for the nursing staff.
 - 3. Hold periodic meetings with nursing supervisors and head nurses.
 - 4. Expansion of the pharmacy newsletter to further improve the communications to the nursing and medical staff.
- C. Expand the clinical training program in conjunction with the School of Pharmacy, for undergraduates and graduate pharmacy students.
 - 1. Provide a clinical teaching laboratory in sterile and nonsterile procedures.
 - 2. Provide for clinical experience in the hospital environment in the outpatient service area and the satellite pharmacy.
 - 3. Explore the feasibility of developing a pharmacy technician training program.
- D. Provide adequate facilities to accomodate the students in the above programs.
 - 1. Provide adequate locker room facilities.
 - 2. Provide adequate conference room and class room facilities.
- E. Cooperate with other departments to share common facilities whenever possible.

INFORMATION CENTER

There is an immediate need for the department to expand its drug and poison information center. The information center is available to the entire hospital staff. In the future it could serve as an information center for the entire state. To provide exemplary service, it will be necessary to expand the department's reference library and information files and provide a 24-hour service. The supervision of a pharmacist or pharmacologist will be needed.

At the present time inquiries are handled by the pharmacist receiving the call. The pharmacist must stop his work in dispensing and search out the answer to the question. Depending on the complexity of the question this may require only several minutes to several hours time. A more complete and faster service could be provided if the center was directed by a full time pharmacist or pharmacologist, who is especially trained in the area of drug information. As the center grows it may be necessary to add additional personnel to help maintain current files and records. Pharmacy or pharmacology residents could be utilized to provide 24-hour coverage.

The information center should be large enough to provide an adequate work area, plus a sufficiently large area for files, copying and printing machines, and possibly electronic data processing equipment.

To provide an easy access for the pharmacist the area should be adjacent to the inpatient pharmacy. If the College of Pharmacy is included in the new Health Science Complex it may be advantageous to combine this information center with the College of Pharmacy library. The personnel working in the area would service both the library and the information center. By combining reference sources, equipment, and personnel the total cost of the operation could be greatly reduced.

CLINIC TRAINING PROGRAMS

It will be advantageous for both the pharmacy department and the college of pharmacy to cooperate in providing a sterile and nonsterile bulk compounding laboratory in the hospital. This will allow for better utilization of qualified personnel and physical facilities, eliminating the duplication which now exists. The plans for the pharmacy are to greatly enlarge both of these areas to provide a more efficient and economical operation which will be suitable for use as a teaching laboratory.

The pharmacy has been cooperating with the school of pharmacy for many years in providing its physical facilities to the senior students as a clinical laboratory in hospital pharmacy. In the curriculum changes in pharmacy, all students are required to take the course in hospital pharmacy. Because of this and the fact that the college of pharmacy classes are becoming larger, larger facilities and more personnel will be needed to provide a superior teaching program. The present plans are to utilize the outpatient facility, the satellites and the inpatient facility as teaching areas for students.

Much talk and discussion has existed throughout the country on the utilization of nonprofessional personnel or pharmacy technicians. The pharmacy department in cooperation with the school of pharmacy should study the proper utilization of these people and the necessity for establishing a formal educational program.

LOCKER ROOM FACILITIES

A locker room or coat room facilities will be needed with the increasing number of students which will be rotating through this area as part of their educational program. The area must provide space for books and clothing. It is not feasible to combine this facility with the employees locker room facilities because of the number of different students which will be rotating through the area and the short duration of time each student would remain in the area.

SHARED FACILITIES

1. Class room area to be used for intradepartmental and interdepartmental educational programs including teaching students from the school of pharmacy.
2. Locker room space for all routine employees of the department (male and female)
3. A large pneumatic tube and a verticle and horizontal conveyor system are needed to provide an economical and efficient delivery system. The conveyor system should be capable of handling separately clean and dirty supplies.
4. The location of Central Supply adjacent to Pharmacy would allow sharing of many commonly used facilities i.e. sterilizers, water stills, ovens, and delivery systems.
5. The use of data processing equipment, and microfilming equipment are needed by pharmacy.
6. Space will be needed on each nursing station to provide a work and conference area for the satellite pharmacist.
7. Information center provided by pharmacy can be utilized by all departments and personnel of the hospital and all other interested persons.
8. The pharmacy should be physically located adjacent to the Operating Room and Surgical areas to provide the most expedient service possible to these very critical areas.

OBJECTIVE #8:

Recruit and maintain well qualified staff in the pharmacy.

- A. Develop an extensive recruitment program.
- B. Develop and utilize an audio-visual program adequately showing the functions of the pharmacy. This could be used for recruitment and educational purposes.
- C. Provide new systems to develop the pharmacists job to more adequately utilize their training. This would more readily attract and keep well qualified personnel.
- D. Salaries must be competitive to the salaries paid in the retail pharmacy.
- E. Provide compensation for night work and shift rotation.
- F. Provide protection for personnel leaving the pharmacy when closing in the evening, both in the hospital and to parking areas.
- G. Improve working conditions.
- H. Improve and provide adequate eating areas and lounge facilities in the hospital.
- I. Provide better parking facilities.

OBJECTIVE #9:

Develop and assist in research projects.

- A. Develop formulations and acceptable manufacturing and assay procedures for pharmaceutical products used within the hospital.
- B. Development of programs through research to obtain fulfillment of future objectives.
- C. Assist other departments and paramedical groups in research studies that are directly or indirectly associated with pharmacy.
- D. Maintain research drug supplies and information pertaining to these drugs in the pharmacy. These drugs should be dispensed under pharmacy controlled conditions.
- E. Development of a program for utilizing data processing equipment to provide a more efficient pharmacy operation.
 - 1. Provide inventory and purchasing records.
 - 2. Provide a means for producing up-to-date patient medication profiles.
 - 3. Provide a means for pricing and billing patients for medications.

EXPLANATION OF EMPLOYEE AND SPACE REQUIREMENT TABLES

The tables follow the same objective outline as the remainder of the report. The first figure that appears in each column is the present number of employees or total number of square feet allotted to this activity. The second figure is the proposed number of employees or square feet that will be needed to perform this activity properly and efficiently when the hospital is expanded to 1008 beds. Explanatory notes are included on the tables. Please note that a portion of the space requirements is for optional areas.

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The satellite system places the pharmacist into a close working association with the nurse and the physician. This enables him to be readily available for information and to perform tasks requiring the skill of a pharmacist. Many of these tasks are those which nursing has been forced to assume through the years. Placing the pharmacist in the working environment of the nursing station improves patient care.

A unit dose system of dispensing medications will be adopted with the satellites. This will eliminate the need for the traditional medication rooms on the nursing station. In this system medications are delivered from the central pharmacy, then stored and administered from a locked cart, a medicine cupboard in the patient's room, or some other acceptable system.

The satellite should be physically placed adjacent to the nursing stations being served. The space requirements will be needed to allow for emergency I.V. additive service, room for inservice training of students from the College of Pharmacy, and all routine pharmacy services needed by nursing.

The above personnel will also be available for the other educational activities within the hospital. Some of the activities that would be included are orientation of new professional personnel, a closer relationship with the nursing staff, and a program to enable a pharmacist to become a part of the medical rounds on the nursing stations to serve as a source of drug information.

OBJECTIVE #1:

To improve outpatient care through efficient use of personnel, equipment and physical facilities.

- A. Through the proper location and layout of the physical facilities the outpatient care can be improved.
 1. The pharmacy service should be conveniently located adjacent to the outpatient clinics.
 2. There should be convenient access to the street and or garage.
 3. The waiting room should be adjacent to the pharmacy, well lighted and served by a public address system.
 4. Consultation booths should be provided in which the pharmacists may present the completed prescriptions to the patient and discuss any problems related to the use of the medications.
- B. To develop a clinical environment program for students in the College of Pharmacy.
 1. Professional personnel should be capable of serving as teaching assistants in the instruction program involving dispensing procedures and patient consulting.
 2. To provide exemplary physical facilities, equipment and procedures.
- C. To develop a pharmacy service closely allied with the teaching, research and service mission of the outpatient clinics.
 1. Further development of a professional fee system for pricing prescriptions on the basis of the cost of providing the service should be accomplished.
 2. To develop a patient medication profile system.
 3. To provide pharmaceutical and pharmacological reference and consultation to the medical staff and students.
 4. To contribute to research by expanding the following services.
 - a. Investigational drug control systems.
 - b. Facilities for extemporaneous preparation of unusual medications and dosage forms

The primary function of the Outpatient Pharmacy is that of providing a complete pharmacy service to outpatients. Secondly, to make available a training program in the clinical environment for pharmacy students. And finally to develop a pharmacy service closely allied with the teaching, research, and service mission of the Outpatient Clinics. The department should be well planned to serve these purposes.

To assist in departmental organization the area should be divided into functional segments including:

1. Patient reception area
2. Patient consultation area (presentation of the completed prescription by a pharmacist)
3. Phone service and drug information desk
4. Dispensing units
5. Compounding area for:
 - a. Ointments
 - b. Solutions
 - c. Sterile products
 - d. Powders
 - e. Biologicals
 - f. Allergens
 - g. Bulk Solutions
6. Labeling and clerical tasks
7. Office space
8. Packaging and mailing
9. Prescription and patient medication profile storage
10. Storage of additional patient supplies (various measuring devices, syringes, needles, bandages, etc.)
11. General storage space
12. Clean up area

This service will provide a first contact with the clinical aspects of the practice of pharmacy for many students.

It is important that the student in his practical training be confronted with and taught correct, professional, and efficient pharmacy techniques. For this reason, emphasis should be placed on the potential of this department as a training area for future pharmacists who will be serving all types of pharmacies.

The dispensing area should be composed of segregated modular units, each unit adequate for a pharmacist-student working team. The arrangement of the pharmacy should be conducive to undisturbed concentration of duties; designed to be quiet with the pharmacists in full view but separated from the reception and consultation areas. A separate area will be needed for various compounding functions. A small laminar flow hood supplied with suction, gas and compressed air will be needed for extemporaneous compounding of sterile medications. Refrigeration must be available for the storage of supplies needed for prescription dispensing and the storage of medications and biologicals to be administered in the clinics. Limited freezer space will be needed for biologicals requiring such storage.

The proposed individual patient medication profile would place on file the contents of prescriptions prescribed in the past, current drug therapy, drug sensitivities and allergies. Clerical personnel will be required to record, maintain and file these records. Additional space will be needed for filing facilities.

As a contribution to the investigational drug studies being conducted within the clinics, the pharmacy should be adequately equipped to procure, store, and record the disposition of these medications. The compounding areas should be designed with the capabilities for the extemporaneous preparation of unusual medications and dosage forms which may be required for research studies and are not commercially available.

OBJECTIVE #2:

Improve inpatient care through efficient use of personnel, equipment and physical facilities.

- A. Development of satellite pharmacies to provide a more complete service to the nursing stations.
- B. To develop a system to provide the pharmacy with a copy of the original orders as written by the physician.
 - 1. This will allow the pharmacy to develop a medication profile for each patient.
 - 2. This will provide pharmacy with information to determine prescribing practices of the physicians and allow pharmacy to adjust their dispensing pattern to better coincide with present prescribing patterns.
- C. Development of a unit dose dispensing system for all medications used in the hospital.
- D. To hire and train well qualified pharmacists.
 - 1. To work with the medical staff and nursing staff on the satellites.
 - 2. To provide a 24-hour coverage.
- E. Development of an intravenous solution additive program performed by the pharmacy to eliminate almost all mixing of parenterals by nursing personnel. To have this system work properly, 24-hour coverage will be needed in the central pharmacy. The results of this program will be improved patient care.
- F. To cooperate with the nursing and medical staffs to develop a uniform emergency medication cart or tray.
- G. Development of an abridged hospital formulary using the present American Hospital Formulary system as a guide.

The satellites located on the medical and surgical areas will require more space (480 sq. ft.) than those servicing the other areas (300 sq. ft.) Each nursing station will need to be large enough to allow a pharmacist to consult with the physician and nurse or to read the patient's chart for additional information. This can be common space on the nursing station.

The satellites will be manned by personnel from pharmacy sixteen hours per day (two shifts). Satellites needing assistance during the remaining eight hours will utilize the pharmacist in the central pharmacy which will be open twenty-four hours a day. During the evening shift it may be possible, depending on physical location of the hospital areas, to cover two satellites with one person. The busy areas such as surgery, medicine and Masonic hospital will need one person to cover each satellite. Sixteen hours of pharmacy coverage is necessary on the satellite. The work load on the many nursing stations does not decrease substantially at 5 p.m. due to late doctors rounds, new admissions, changed orders etc. Those areas having a decreased work load have been regrouped and are serviced by three satellites instead of six.

The following is a list of personnel needed for the satellites. Nine pharmacists for coverage during the day. Three additional pharmacists are needed to rotate with the other nine to cover days off, weekends and holidays. The evening shift will require three pharmacists to cover the six remaining areas. Two pharmacists will be needed to rotate with these people for coverage on days off, weekends and holidays.

With the expansion of the residency and internship program, these people can be utilized to assist the pharmacist during the day shift and help fill in on the evening shift.

The central pharmacy will become the packaging and storage area from which all medications (in designated sizes) will be supplied through the satellite system when needed by the nursing stations.

The amount of space presently utilized by the dispensing area in the central pharmacy is inadequate. It has been estimated that six registered pharmacists will be needed to rotate through two shifts, seven days a week, holidays inclusive. Two additional pharmacists will be needed for coverage on the night shift, providing twenty four hour coverage.

OBJECTIVE #3:

Provide a more efficient bulk compounding and prepackaging operation.

- A. Utilization of more non-professional personnel to perform routine functions under supervision. This would enable the professional personnel to better utilize their training and abilities in more specialized functions.
- B. Expansion of a bulk compounding program with proper controls.
 - 1. Non-sterile manufacturing facilities need to be improved and expanded to provide a more economical means of bulk compounding and packaging.
 - 2. To provide a sterile manufacturing and packaging service, the pharmacy needs a clean room and sterile work area.
- C. Expansion of the prepackaging function to include more non-sterile and sterile items now being packaged on an individual basis.

The main function of this area is to provide the necessary products for the dispensing services of the pharmacy. An additional function will be to utilize this area as a teaching facility for graduate and undergraduate pharmacy students.

Sterile bulk compounding, nonsterile bulk compounding, prepackaging, and clean-up are the four basic activities included in this area of pharmacy. To efficiently utilize personnel, equipment, and space, these areas should be adjacent to one another.

Two pharmacists will be responsible for the teaching function and the overall operation of these areas. One pharmacist will be responsible for the non-sterile compounding and packaging activity. The second pharmacist will be responsible for the sterile compounding and packaging activity. Nonprofessional personnel, under the supervision of a non-professional supervisor, will do the majority of the work in this area. This personnel can be shifted from one work area to another depending upon the work schedule in each area.

Equipment such as water stills and reservoirs, label printing and dispensing machines, and other packaging equipment can be shared by all four work areas, thus reducing duplication of equipment.

The total requirement for space can be reduced by having a common storage area for equipment, bulk chemicals and packaged medications. As the scope of this area changes the storage area can be rearranged to accomodate this change, without extensive remodeling.

STERILE AND NON-STERILE BULK COMPOUNDING

To provide an efficient bulk compounding area it will be necessary to greatly increase the working and storage area. There is a need to purchase more and larger equipment to enable us to produce items in economical quantities. If this is done, a much larger area will be needed to provide adequate storage for raw materials, as well as the finished products. An area will be needed for new and larger stills and reservoirs to provide an adequate supply of water for the compounding areas.

In the sterile compounding area there will be a need for space for a "clean" room. Large equipment, such as Laminar Flow Hoods, mixing tanks, and packaging equipment will require additional space. Because of the wide range of sizes and types of containers that will be packaged in this area there will be a need to have certain areas that are to be used for specific activities. If the pharmacy is not adjacent to the Central Supply area there will need to be an additional area for an autoclave. Outlets for gas, vacuum and compressed air will be needed in this area.

PREPACKAGING

This program is being expanded rapidly. Prepackaging has been expanded to include sterile solutions as well as oral products for dispensing in the inpatient and outpatient service areas. Further expansion of the operation is dependent upon having a larger work area and also a much larger storage area. Because of congestion, prepackaging is now done in several areas. To make this a more efficient, better controlled operation it should be done in one central area with optimal working conditions for the employees. The prepackage area should be adjacent to the bulk compounding area because many of the products that are made in the pharmacy are prepackaged before they are dispensed.

With the development of the use of unit dose medication, the scope of the prepackaging area will change. As the availability of these products increase and the cost per unit decreases it may be necessary to package only those items that are not commercially available. It is not conceivable that unit dose packages will be utilized for outpatient dispensing, therefore this part of the operation will remain unchanged. The storage space presently used for prepackaged medications will have to be expanded considerably to provide adequate space for storage of unit dose packages.

CLEAN-UP AREA

The bottle washing area will need to be larger to accommodate its entire function. There must be a separate area for the storage of dirty bottles and equipment, for the cleaning of bottles and equipment for wrapping clean equipment and supplies for autoclaving, and an adjacent storage area for clean bottles and equipment and other supplies.

OBJECTIVE #1:

Improve drug control and purchasing procedures within the pharmacy department.

A. Development of a Control Laboratory

1. To provide a means for assaying and controlling all items that are manufactured or packaged in the pharmacy department.
 2. To provide a means for testing the quality of drugs and chemicals purchased by the pharmacy department.
 3. To provide facilities and personnel for developing special dosage forms, when they are required.
- B. Purchasing and Storage
1. Improve purchasing procedures by utilizing electronic data processing equipment.
 2. To have proper and adequate storage facilities for all chemicals and medications stored in the pharmacy.

CONTROL LABORATORY

A control laboratory is an essential part of a pharmacy operation with the diversity of this department. It is of prime concern that this area be established as soon as possible.

Besides a paper check, it is necessary to do a chemical check of all products that are made in the department in addition to the raw chemicals and drugs that are procured. A chemist would be responsible for the actual tests and assay work done in this area. The pharmacist responsible for this area could serve as a supervisor as well as instructor in the college of pharmacy. If the facilities and the equipment were shared with the college of pharmacy this area could be utilized for research by graduate students in addition to the routine assay work.

PURCHASING AND STORAGE

The main requirement in this area is the need for proper and adequate storage facilities to permit the development of an efficient purchasing procedure. The development of a Data Processing inventory system will permit a nonprofessional to handle the routine ordering and to provide adequate controls of the chemicals and medications.

A large area will be needed for the centralized storage of most items used in the pharmacy. This area should be adjacent to the in-patient pharmacy and the compounding and prepackaging area to enable all storage to be centralized in one area. In addition to the main storage area the following special areas are required:

1. A properly vented and constructed area is needed for the storage, pouring, and packaging of volatile liquids. If possible, this area should be adjacent to the nonsterile bulk compounding area.
2. A large walk-in refrigerator is needed in the central storage area for the storage of all items requiring refrigeration. There must be refrigeration space in each of the dispensing areas and on the satellite pharmacies.
3. Adequate storage will be needed for all records. A space-saver process i.e., microfilming, if used in all possible areas would eliminate the need for some of the area allotted for this type of storage.
4. A large walk-in vault for storage of stock supplies of narcotics, and barbiturates, and other controlled drugs.

OBJECTIVE #5:

Improve drug control throughout the hospital.

- A. To play an active role in the functioning of the pharmacy and therapeutics committee and the formulary system.
- B. To centralize and control the dispensing of investigational drugs and providing information pertaining to them in the pharmacy.
- C. To develop more efficient methods for dispensing narcotics and barbiturates would be accompanied by better controls for these drugs.
- D. To provide controls on supplies and medications stored on the nursing stations.
 1. Expansion of the present Automatic Stock Replacement System to the Operating Room, Recovery Room, Urology, and the clinics and possibly expand the items now under this system.
 2. Further development of the Intravenous Fluid Automatic Replacement System on the stations. It is presently in operation on a trial basis on nine stations. Changes may be necessary in the system before it is expanded further.

PHARMACY AND THERAPEUTICS COMMITTEE

It is important for the pharmacy to be active in the Pharmacy and Therapeutics Committee. This committee approves or deletes medications that are to be included in the formulary. This type of control reduces the number of medications that are stocked by the pharmacy, thus reducing inventory costs, storage space, and the time needed to maintain adequate stocks. Utilizing a formulary system of drug control, a more select group of drugs having similar action are stocked. This enables purchasing of larger quantities, better utilizing the bid system of purchasing and further reducing the cost of the medication to the patient.

INVESTIGATIONAL DRUGS

The pharmacy is equipped to handle the necessary controls and records for a well controlled investigational drug program. In handling investigational drugs centrally, all supplies can be dispensed from a central source and all inquiries concerning them can be handled through one location. Many inquiries are now made at the pharmacy concerning these drugs, their location, their use, precautions, investigators, etc. Many times pharmacy is unable to answer these questions because the material and information is not made available. At present a secretary is utilized in many areas to control these drugs. Under the new control system, a pharmacist would always be available to dispense the needed medication. He is also equipped to answer questions concerning possible side effects and precautions. This would eliminate the present confusion created by the poorly organized decentralized system now being utilized.

NARCOTICS AND BARBITURATE CONTROLS

The present system of handling narcotics and barbiturates which has been adopted within the last year has simplified the task required of nursing to account for station stock narcotics and barbiturates, thus reducing the chance for error. Further changes in this system will be determined by the development of the satellites and the unit dose system. The final form of the system will probably require a different type of storage area on the nursing stations.

CONTROL OF NURSING STATION STOCK

The satellite pharmacy program will provide more control of medications on the nursing station. Until all areas are serviced in this manner, staff pharmacists will make routine station visits to check the storage and use of medications and discuss any problems with the head nurse for this area.

The following programs have been initiated to improve the control of floor stock and intravenous solutions stored on the nursing stations.

1. Automatic Stock Replacement - This activity will remain about constant allowing only for the increase in the number of nursing stations serviced. This is primarily handled by nonprofessional personnel. The space requirements on the nursing stations is approximately fifteen linear feet of shelf space. The storage space in the pharmacy is included in the prepackage storage area requirements.
2. Intravenous Fluid Automatic Stock Replacement- Initially this activity will be used to supply the individual nursing stations. When the I.V. additive program is established this system will be modified to restock the area or areas where the solutions are being prepared. The work will be handled by nonprofessional personnel.

CONCLUSION 18:

Strengthen the professional contribution by the pharmacy through the availability of educational program for pharmacy personnel.

- A. Expand the graduate hospital pharmacy residency program.
 1. Further develop a manual and schedule for the program.
 2. Expand the scope of the program.
- B. Expand the training program for pharmacy interns.
- C. Provide adequate office space for the administrative personnel.

The expansion of the residency and internship programs will be beneficial to the pharmacy department as well as the pharmacy profession. This type of program provides the department with a ready source of eager qualified professional personnel. The students in these programs will be able to work along with the registered pharmacists as part of their training. In many cases it will be possible to cover an area with a pharmacist and an intern or resident rather than a second pharmacist. Because of this, each pharmacist will be able to service a larger area i.e., such as in the satellite pharmacy program.

A central office area is desperately needed for the Chief and Assistant Chief pharmacists and supporting clerical personnel. Office space will be needed in other areas of the pharmacy to provide a work and record storage area for the supervisor in these areas.

A conference room located adjacent to the central office is necessary for conducting intradepartmental conferences and meetings and for small interdepartmental meetings or classes. This area could also be utilized for administrative associated activities that will be performed by non-professional personnel, i.e. Hospital Formulary supplements, pharmacy newsletters, etc.

OBJECTIVE #7:

Maximize professional pharmacy services through improved interdepartmental relationship with the nursing staff, the medical staff, and the college of pharmacy.

- A. Establish a drug information center
 - 1. Must be accessible to the pharmacy staff, medical staff, nursing and other interested personnel of the hospital.
 - 2. Should serve as a poison control center for the hospital as well as for the entire community.
 - 3. Would contain information concerning medication available on the market and those listed in the hospital formulary.
 - 4. Must be staffed by a pharmacist or a pharmacologist 24 hours a day to be effective.
- B. Establish a better means of communication between the Pharmacy staff and the medical and nursing staff.
 - 1. Conduct an orientation for all new nursing staff, interns, residents, and all other interested medical staff to the policies of the pharmacy.
 - 2. Develop inservice educational programs for the nursing staff.
 - 3. Hold periodic meetings with nursing supervisors and head nurses.
 - 4. Expansion of the pharmacy newsletter to further improve the communications to the nursing and medical staff.
- C. Expand the clinical training program in conjunction with the School of Pharmacy, for undergraduates and graduate pharmacy students.
 - 1. Provide a clinical teaching laboratory in sterile and nonsterile procedures.
 - 2. Provide for clinical experience in the hospital environment in the outpatient service area and the satellite pharmacy.
 - 3. Explore the feasibility of developing a pharmacy technician training program.
- D. Provide adequate facilities to accomodate the students in the above programs.
 - 1. Provide adequate locker room facilities.
 - 2. Provide adequate conference room and class room facilities.
- E. Cooperate with other departments to share common facilities whenever possible.

INFORMATION CENTER

There is an immediate need for the department to expand its drug and poison information center. The information center is available to the entire hospital staff. In the future it could serve as an information center for the entire state. To provide exemplary service, it will be necessary to expand the department's reference library and information files and provide a 24-hour service. The supervision of a pharmacist or pharmacologist will be needed.

At the present time inquiries are handled by the pharmacist receiving the call. The pharmacist must stop his work in dispensing and search out the answer to the question. Depending on the complexity of the question this may require only several minutes to several hours time. A more complete and faster service could be provided if the center was directed by a full time pharmacist or pharmacologist, who is especially trained in the area of drug information. As the center grows it may be necessary to add additional personnel to help maintain current files and records. Pharmacy or pharmacology residents could be utilized to provide 24-hour coverage.

The information center should be large enough to provide an adequate work area, plus a sufficiently large area for files, copying and printing machines, and possibly electronic data processing equipment.

To provide an easy access for the pharmacist the area should be adjacent to the inpatient pharmacy. If the College of Pharmacy is included in the new Health Science Complex it may be advantageous to combine this information center with the College of Pharmacy library. The personnel working in the area would service both the library and the information center. By combining reference sources, equipment, and personnel the total cost of the operation could be greatly reduced.

CLINIC TRAINING PROGRAMS

It will be advantageous for both the pharmacy department and the college of pharmacy to cooperate in providing a sterile and nonsterile bulk compounding laboratory in the hospital. This will allow for better utilization of qualified personnel and physical facilities, eliminating the duplication which now exists. The plans for the pharmacy are to greatly enlarge both of these areas to provide a more efficient and economical operation which will be suitable for use as a teaching laboratory.

The pharmacy has been cooperating with the school of pharmacy for many years in providing its physical facilities to the senior students as a clinical laboratory in hospital pharmacy. In the curriculum changes in pharmacy, all students are required to take the course in hospital pharmacy. Because of this and the fact that the college of pharmacy classes are becoming larger, larger facilities and more personnel will be needed to provide a superior teaching program. The present plans are to utilize the outpatient facility, the satellites and the inpatient facility as teaching areas for students.

Much talk and discussion has existed throughout the country on the utilization of nonprofessional personnel or pharmacy technicians. The pharmacy department in cooperation with the school of pharmacy should study the proper utilization of these people and the necessity for establishing a formal educational program.

LOCKER ROOM FACILITIES

A locker room or coat room facilities will be needed with the increasing number of students which will be rotating through this area as part of their educational program. The area must provide space for books and clothing. It is not feasible to combine this facility with the employees locker room facilities because of the number of different students which will be rotating through the area and the short duration of time each student would remain in the area.

SHARED FACILITIES

1. Class room area to be used for intradepartmental and interdepartmental educational programs including teaching students from the school of pharmacy.
2. Locker room space for all routine employees of the department (male and female)
3. A large pneumatic tube and a verticle and horizontal conveyor system are needed to provide an economical and efficient delivery system. The conveyor system should be capable of handling separately clean and dirty supplies.
4. The location of Central Supply adjacent to Pharmacy would allow sharing of many commonly used facilities i.e. sterilizers, water stills, ovens, and delivery systems.
5. The use of data processing equipment, and microfilming equipment are needed by pharmacy.
6. Space will be needed on each nursing station to provide a work and conference area for the satellite pharmacist.
7. Information center provided by pharmacy can be utilized by all departments and personnel of the hospital and all other interested persons.
8. The pharmacy should be physically located adjacent to the Operating Room and Surgical areas to provide the most expedient service possible to these very critical areas.

CONCLUSION

Recruit and maintain well qualified staff in the pharmacy.

- A. Develop an extensive recruitment program.
- B. Develop and utilize an audio-visual program adequately showing the functions of the pharmacy. This could be used for recruitment and educational purposes.
- C. Provide new systems to develop the pharmacist's job to more adequately utilize their training. This would more readily attract and keep well qualified personnel.
- D. Salaries must be competitive to the salaries paid in the retail pharmacy.
- E. Provide compensation for night work and shift rotation.
- F. Provide protection for personnel leaving the pharmacy when closing in the evening, both in the hospital and to parking areas.
- G. Improve working conditions.
- H. Improve and provide adequate eating areas and lounge facilities in the hospital.
- I. Provide better parking facilities.

OBJECTIVE 11:

Develop and assist in research projects.

- A. Develop formulations and acceptable manufacturing and assay procedures for pharmaceutical products used within the hospital.
- B. Development of programs through research to obtain fulfillment of future objectives.
- C. Assist other departments and paramedical groups in research studies that are directly or indirectly associated with pharmacy.
- D. Maintain research drug supplies and information pertaining to these drugs in the pharmacy. These drugs should be dispensed under pharmacy controlled conditions.
- E. Development of a program for utilizing data processing equipment to provide a more efficient pharmacy operation.
 1. Provide inventory and purchasing records.
 2. Provide a means for producing up-to-date patient medication profiles.
 3. Provide a means for pricing and billing patients for medications.

EXPLANATION OF EMPLOYEE AND SPACE REQUIREMENT TABLES

The tables follow the same objective outline as the remainder of the report. The first figure that appears in each column is the present number of employees or total number of square feet allotted to this activity. The second figure is the proposed number of employees or square feet that will be needed to perform this activity properly and efficiently when the hospital is expanded to 1000 beds. Explanatory notes are included on the tables. Please note that a portion of the space requirements is for optional areas.

PROGRAM YEAR 1963-1964

ACTIVITY OR AREA	Instructional Support	Personnel	Apparatus or Equipment	Days/Week or Months	Reg. or as a result of Reg.	Change in Reg. Budget
I. Outpatient	1 - 1/2	2 - 5	1 - 2	-	1/2 - 1/2	1 - 2
II. Inpatient						
A. Central Pharmacy	1/2 - 1/2	6 - 8	2 1/2 - 5	1/4 - 1/4	3 - 2	3 1/2 - 2
B. Satellite Pharmacy	1/2 - 1/2	1 - 17	1/2 - 9	0 - 0	0 - 4	0 - 2
III. Bulk Compounding and Packages	3/8-1/8	1 1/2 - 2	0 - 2	1/2 - 1/4	1 1/4 - 6	0 - 1/4
IV. Packaging and Disp. Control						
A. Control Lab	1/8 - 1/8	-	0 - 1	Control	0 - 1/2	0 - 1/4
B. Packaging	3/8 1/4	-	-	1/4 - 1/2	1/4 - 1/2	1 - 1/2
V. Preparation, loading and other program	1/4 - 1/8	staff in each area	-	-	-	1/4 - 1/4
VI. Control office	Chief Pharmacist 3/4 - 1	-	-	-	-	1 - 1
VII. Drug Information Center	1/8 - 1/8	0 - 1	0 - 8	-	-	0 - 1
TOTALS	1 - 1	10 1/2 - 88	11 - 18	1 - 2	8 - 18 1/2	5 3/4 - 9 1/4

STATE PROJECTS - 1/17/2000

ACTIVITY CATEGORY	OFFICE	WORK	TRAVEL	TRAVEL	TRAVEL	TRAVEL	OFFICE
I. Acquisition	20 - 160	300 - 700	100 - 500	100 - 500	100 - 500	100 - 500	20 - 160
II. Budgeting	0 - 160	600 - 1000	50 - 450	50 - 450	50 - 450	50 - 450	0 - 160
A. Contract Preparation		50 - 2700	10 - 450	10 - 450	10 - 450	10 - 450	60 - 3150
B. Schedule Preparation							
III. Work Contracting and Payment	0 - 150	810 - 2000	210 - 2000	210 - 2000	210 - 2000	210 - 2000	162 - 810
IV. Post-Contracting	0 - 200	7-9000	0 - 100	0 - 100	0 - 100	0 - 100	2-1000
A. Contract Closeout	10-100	50 - 200	1700-3500	1700-3500	1700-3500	1700-3500	1700-3500
B. Contract Review		0 - 200	0 - 1000	0 - 1000	0 - 1000	0 - 1000	0 - 1200
C. Schedule Review							
V. Materials and Equipment							
VI. Contract Office	110 - 500	0 - 2000	50 - 150	50 - 150	50 - 150	50 - 150	200 - 850
VII. Long Information	5 - 200	0 - 400	5 - 400	5 - 400	5 - 400	5 - 400	10 - 1600
TOTALS	165-1150	1762-9200	2715-8300	2715-8300	2715-8300	2715-8300	4692-18,950

* 500 sq. ft. in front end work for printing related to schedule

0 - sq. ft. in front end work for materials

* 200 sq. ft. in front end work

* 800 sq. ft. in front end work work area for materials

December 2, 1969

TO: Mr. Peter H. Sammond, Director of Hospital Planning
FROM: Miss Marie Perreault, Chief Pharmacist
SUBJECT: Planning of Hospital Pharmacy Area

An impromptu meeting was held in 2112 Powell Hall on December 1, 1969 between Mr. Schultz, Mr. Leipus, Mr. Lewerenz and myself. A discussion was held concerning the current plans on relocation, expanding and remodeling of present hospital departments.

It was the general consensus of the group that the major core service departments of the hospital should be located centrally adjacent to each other, especially Pharmacy and Central Sterile Supply, which work closely together both in supplying the nursing stations and in the manufacturing of sterile products.

A major consideration in deciding the location of the core service departments will be the communication systems planned for the delivery and receipt of materials throughout the hospital complex. Among the areas which move large quantities of goods daily are the Pharmacy, Central Sterile Supply and the laundry. Being on the first floor would relieve the present elevator facilities of additional work loads.

It is felt that a re-evaluation of requirements be made, particularly in reference to the location of departments, and that new plans be drawn up by the architects. The following suggestions may be considered in this re-evaluation. It seems unnecessary that the Canteen and employee locker room facilities and the Medical Adytum remain on the first floor. Employee locker and canteen areas could be moved to second floor. Employees now enter the hospital on second or third floor and must walk down to first for these facilities. The medical adytum could possibly be moved to the present kitchen area on second floor, providing the medical students with an outside exposure, etc.

Other departments, namely; Materials Management, Data Processing, Scientific Apparatus, Plant Services, designated on the architect's plans could possibly be relocated with the same expenditure of dollars. With the relocation of the above areas, space would be available to Pharmacy, Housekeeping, Central Sterile Supply and Engineers for expansion of present facilities, allowing for larger, more workable areas. It is very difficult for Pharmacy to have areas which are long and narrow with public corridors running through the center (the architects' present plans seem to suggest this type of arrangement). This setup presents work flow difficulties and security problems.



Pharmacy is presently undertaking a major remodeling program costing approximately \$50,000 to \$60,000. Included in the remodeling is the construction of a volatile storage and manufacturing area, installation of new water distilling apparatus, etc. If the moving of this area with equipment is possible, it would be very costly. It would seem impractical to move a recently remodeled department, making it less efficient than it presently is, when another relocation is being contemplated with the construction of a new facility in 1985.

I would like to suggest a meeting between Mr. Sammond, Mr. Schultz, Mr. Leipus, Mr. Leverenz or Mr. Petrykowski, myself and the architects to discuss the optimum location of all core service departments.

Sincerely,



Marie Perreault
Chief Pharmacist

MP/sf

PHARMACY MEETING

Minutes for the Meeting of February 17, 1970

Present: Marie Perreault, Tom Jones, Ken Taylor, Fred Larsen, Olga Petters, Robert Smith, John Phelan, Paul Queeney

LOCATION

With regard to location, an attempt is being made to locate pharmacy on the first floor, although exact position is not yet determined and will depend on decisions concerning linen distribution, and possibility of moving medical school adytum and locating employee facilities in its place.

MOVEMENT OF GOODS

Delivery - Deliveries occur every 1 1/2 hours. Some question was raised as to the necessity of having such frequent delivery but no change was indicated. If an order is placed with a time limit on it, delivery will take place at the time of the next 1 1/2 hourly round. Delivery time varies with orders that have no time requirement. In cases of some emergency, nurses come down to pick up orders. This is required up to 4 1/2 times daily per station. In cases of mail orders, delivery is particularly slow taking three days with luck.

Order Systems - Various systems could be utilized for the transfer of drug orders from the doctor.

1. Doctor's orders are transferred directly (present system)
2. Computers
3. Facsimilie writers with possibility of terminal at bedside
4. Pneumatic tubes
 - a. Problem with pneumatic tubes is the transfer of large pharmaceutical items like IV's. The size of the IV bottle however could be used to govern the diameter of the pneumatic tube.
 - b. On the other hand pneumatic tube communication appears to be desirable for a number of reasons:
 - i. If the nurse server is utilized, question was raised whether this would necessitate the presence of a pharmacist on the station, particularly an ICU station. It is felt that a quick reliable communications system with pharmacy might obviate any need for such expensive manpower.
 - ii. In all areas of the hospital it appears that such quick communications with pharmacy will be a time saver if available for 24 hour service. Such a system could service the ER when the daytime outpatient satellite pharmacy was closed.

REPLACEMENT

Pharmacy stocks are now replaced automatically throughout the hospital.

Clinics	1 delivery daily
ICU	2-3 deliveries daily
OR and PAR	1 delivery daily

- Stations Stock replacement on the station is at present unresolved.
Factors influencing any decision
1. Outcome of Unit Dose project
 - a. Distribution
 - b. Replacement and storage
 2. Decision regarding the use of nurse server
 - a. Effect on distribution systems
 - b. Necessity of security precautions with medications

With a view to reducing the traffic congestion on the station, Main Associates are suggesting that pharmacy consolidate its delivery system with CSS. By this system pharmacy would make up individual medications for either patients or floors depending on results of unit dose experimentation. Medications would be delivered by CSS. It is agreed that more time would be involved in this procedure but it is felt that in terms of alleviating traffic problems it might be worthwhile.

Pharmacy's reservation concerning this arrangement involves its fear of losing control over medications. In the case of narcotic drugs this is most evident. Security measures required in narcotic drug delivery make it necessary that pharmacy take full responsibility and hence train its own personnel in handling of these drugs. In the case of narcotics, then, a special route would be necessary regardless of other decisions regarding drug delivery. Pharmacy does feel however, that since, even in the case of less tightly controlled drugs, final responsibility for all drug distribution will lie with the department, pharmacy personnel should handle all drug deliveries.

PHARMACY STORAGE

It appears that a more satisfactory storage arrangement with the Como warehouse would affect pharmacy storage only slightly. At present, pharmaceutical items like IV's can be received from vendors in a day. If an order is placed by 10:30 it can be received from Como Avenue by that afternoon. Como also has a car available for running out emergency items.

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April 1, 1970

Dear Mr. Peter Sammond

Subject: Building Program Revisions

From: Marie Perreault, Chief Pharmacist

It is not possible for the pharmacy to use less space for the operation of a 900 bed hospital than for a 1000 bed hospital. Our main working areas would need to be the same. The storage areas need to be the same (number of items remaining the same) but the frequency of ordering would change.

The pharmacy is very crowded now as are all the areas in the hospital. The area proposed in the building discussions up to now would have been adequate for us. The existing area is not adequate for efficient operation.

We will require more space to initiate and develop IV additive and unit dose programs for the entire hospital. It may be possible to do a pilot study, in the present area, but not an entire program. If the medical records area or the medical adytum area can be moved, we would like to obtain some of the area to carry on these.

One of the reasons that projects have not been progressing as proposed is the fact that the present area is very small and personnel lack enthusiasm to try new projects when the area is not adequate to do the operations efficiently or in entirety.

Another program that is developing is the additional load of more pharmacy students, both undergraduate and graduate. We will need areas for teaching.

Any of the proposed programs in the roles and goals such as control program in bulk compounding and IV additive area would be impossible now.

Of course, the ideal would be that we would have a new hospital and be able to construct the areas for maximum utilization.



Marie Perreault

UNIVERSITY OF *Minnesota*

UNIVERSITY HOSPITALS • MINNEAPOLIS, MINNESOTA 55455

July 9, 1971

TO: All medical staff, interns, residents

FROM: Dr. John Najarian, Chief of Staff

SUBJECT: New Regulations - Bureau of Narcotics and Dangerous Drugs

The "Controlled Substances Act", administered by the Bureau of Narcotics and Dangerous Drugs, U. S. Department of Justice, requires that, after July 29, 1971, prescriptions written for controlled drugs (see attached list) must be signed by a physician with a valid BNDD registration number.

The effect of this Act on University Hospitals patients will be that prescriptions written for outpatients and "take home medications" which are intended to be filled in pharmacies other than at University Hospitals, will not be honored by pharmacists unless the prescription is signed by a physician with a valid BNDD number, and the number is written on the prescription. (Prescriptions written and filled at the University of Minnesota Hospitals for inpatients will be covered by our exempt BNDD classification.)

The Medical Staff Hospital Council therefore strongly urges all physicians eligible for licensure in the State of Minnesota to obtain it and to subsequently apply for their own BNDD number. Registration blanks for application for personal BNDD numbers are available from the Hospital Pharmacy (Phone 3-8528).

After July 29, 1971, it is the responsibility of each University Hospitals physician to insure that prescriptions written for medications which will be filled outside this Hospital must have the signature of, or be countersigned by, a physician licensed to practice medicine in the State of Minnesota and who also has a current personal registration number issued by the Bureau of Narcotics and Dangerous Drugs.

For further clarification of this memo, please contact Miss Marie Perreault, Director of Pharmacy Services, 3-8528.



7/9/71

BNDD drugs now approved and stocked in Pharmacy are listed below. This does not include all BNDD drugs. The complete list is too long to print. Questions concerning whether a certain drug is BNDD registered can be directed to Drug Information Center, 3-8888. Generally speaking, Schedule I drugs are substances with high potential for abuse but have no currently accepted medicinal use. Schedule II contains the former Class A narcotics and injectable methamphetamines. Schedule III consists of former Class B narcotics and the majority of DACA drugs, plus paregoric. Schedule IV contains drugs classified as DACA drugs which have lower abuse potential than those in Schedule III. Schedule V consists of both prescription and over-the-counter products of former Class X drugs.

Acetaminophen with Codeine
Alphaprodine HCl (Nisentil)
Alprine (same as Fiorinal)
Ambenyl Expectorant
Amphetamine (all salts) (Benzadrine)
Amobarbital (Amytal)
Amytal
Anileridine (Leritine)
Aspirin Compound with Codeine
Barbital
Benzedrine
Butabarbital Sodium
Camphorated Opium Tincture (Paregoric)
Carbital (1/2 and full strength)
Chloral Hydrate
Cocaine (all salts)
Codeine (all salts)
Copavin
Daprisal
Demerol
Desoxyn
Dexamyl
Dexedrine
Dextro-amphetamine sulfate
Dilaudid
Dolophine
Doriden
Edrisal
Emperin Compound (#1, #2, #3, #4)
Ephedrine and Amytal
Equinal
Eskabarb
Ethchlorvynol (Placidyl)
Ethinamate (Valmid)
Fentanyl (Sublimaze)
Fiorinal
Glutethimide (Doriden)
Hexobarbital (Sombucaps)
Innovar
Leritine
Levo-Dromoran
Levorphanol Tartrate (Levo-Dromoran)
Lomotil
Margane
Mebarol

Mebroin
Meperidine (Demerol)
Mephobarbital (Mebarol)
Meprobamate (Equinal, Miltown)
Methadone Hydrochloride (Dolophine)
Methamphetamine (Desoxyn)
Methylphenidate (Ritalin)
Methyprylon (Noludar)
Morphine
Nalline
Nalorphine HCl (Nalline)
Nembutal
Niripase
Nisentil
Noludar
Opium
Opium and Belladonna Suppositories
Orthoxical
Paraldehyde
Paregoric
Parepectolin
Pentobarbital (Nembutal)
Pentothal Sodium
Percodan
Phenergan with Codeine
Phenmetrazine (Preludin)
Phenobarbital
Phenobarbital and Belladonna
Placidyl
Plexonal
Preludin
Prozine
Ritalin
Rotase
Rotase Mitte
Secobarbital
Seconal
Sombucaps
Sublimaze
Tedrol (by Minnesota Law)
Terpin Hydrate with Codeine Elixir
Thiopental Sodium (Pentothal)
Tuinal
Tylenol with Codeine