A STUDY TO DETERMINE THE MOST EFFECTIVE MANAGERIAL SYSTEM FOR THE DIAGNOSTIC SERVICE, DEPARTMENT OF RADIOLOGY, BEN TAUB GENERAL HOSPITAL, HOUSTON, TEXAS

A Problem Solving Project Report

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By

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I. INTRODUCTION

General Information

The department of radiology is one of the cornerstones of both inpatient and outpatient care in all hospitals. The proper planning of this department, especially the proper foresight in expansion planning, is the most critical stage of producing an efficient and functional department. Once the hospital has been constructed, the next objective of the staff who are to use the facility is the proper and most effective organization to produce the greatest yield from the facility and the personnel.

The proper utilization of the department of radiology is a common yet uncoordinated subject discussed by many writers. There are those writers in the field of radiology who discuss only the subject of interest at the moment and who never attempt to integrate their subject with the other functions within the radiology department. Most articles in the literature dealing with the radiology department discuss individual subsystems within the total operation. These authors address their attention to filing systems, equipment replacement, staffing, scheduling, and so forth. However, review of the literature from 1950 to 1968 produces few discussions of the overall coordination and organization of departments of radiology within hospitals.

Radiological technicians are admonished to assume more of the administrative duties in running the radiology department.[1] Yet few authors have devoted their efforts to an even more important person in the management of the x-ray department. The role of the chief physician, department of radiology, and his philosophy toward the organization of the department are most critical to the productivity of the department. There is no lack of writings in all categories of literature to show that unless an organization has managerial interest and incentive, no degree of organization at lower levels can overcome this deficit. Accompanying this pure organizational concept of effective management is the concept of the "power" force held by higher management. This alludes not only to the ordained formal organizational superior-subordinate relationship[2] but also to the intangible "power" derived by demonstrating one's ability to enforce his authority.[3] Mechanic[4] points out that this power is related to the dependence of those over whom this power is exercised. The more dependent these people are the more one can impose his will upon them. This concept of power complementing the formal authority relationship is, to say the least, abstract.

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[1]Thomas P. Weil and Theodore T. Ott, "Management Aspects of the Department of Radiology," Radiologic Technician, XXXVII (May, 1966), 321.

[2]David Mechanic, "Sources of Power of Lower Participants in Complex Organizations," Administrative Science Quarterly, VII (December, 1962), 349.

[3]W. J. Hickey, "Power, Conflict, and the Administration," Hospital Administration, XIII (Winter, 1968), 11.

[4]Mechanic, "Sources of Power," p. 352.

Hospital Setting and History

Although this study specifically deals with the Ben Taub General Hospital of the Harris County Hospital District, the history behind this hospital and its sister hospital, Jefferson Davis, is necessary to acquaint one with the background of the following discussion.

The present Harris County Hospital District, voted in in 1965 by the populace of Harris County, consists of two hospitals. The Ben Taub General Hospital, with 431 beds, was opened in May, 1963, in the medical center complex on the west side of Houston. The 340-bed Jefferson Davis Hospital, reopened in 1966 after closure for approximately two and a half years for renovation, is situated on the Allan Parkway near downtown Houston. It is the topic of the book, The Hospital, by Jan de Hartog.

Over the years Jefferson Davis became both the sanctuary for the poor and a dilemma for the City. Due to shortages of funding, the hospital slowly but progressively became a derelict edifice caring for far more than its walls could hold.

In 1949 affiliation with Baylor University College of Medicine greatly bolstered the professional care capability of the charity hospital system.

With the opening of Ben Taub General Hospital in 1963, Jefferson Davis was given a long overdue rest for renovation and today, in consonance with area health planning, has been reopened as the primary center for treatment of tubercular patients and obstetrics for Harris County.

Conditions Prompting the Study

With the previous historical background pointing up the extreme difficulty in maintaining good patient care in the absence of adequate budget, one can readily see how the Ben Taub Hospital has been plagued with many design inadequacies. In the department of radiology there is little room for expansion, and the access ways in and out of the department are not ideal. However, these are defects that are built into the structure, and the cost of correction makes living with them necessary. These disadvantages can be analyzed and somewhat circumvented.

There is an even more important means of improving the effectiveness of the department. The Ben Taub Hospital is affiliated with Baylor University School of Medicine and, as such, functions directly as a teaching hospital for Baylor. It is written into this affiliation agreement that the Harris County Hospital District is to staff and operate the hospital out of county funds with the understanding that Baylor University School of Medicine is to furnish the hospital with the professional physician element.

The affiliation agreement (paragraph 7, Appendix A) contains the answer to one of the biggest problems recognizable in the present management of the radiology department. The agreement provides the option to appoint a head of the department different than the head of the department of radiology of Baylor Medical School.

Other conditions prompting an analysis of the radiology department include scheduling between the main department and the emergency room x-ray facility and the systems of reports and filing.

The Problem

The problem is to determine the most effective managerial system for the diagnostic service, Department of Radiology, Ben Taub General Hospital, Houston, Texas.

Objectives

The paper is undertaken with the understanding that no matter how well conceived and organized a managerial form, all facets unique to the institution under study cannot be accommodated.

The foremost objective of this study is to analyze the existing managerial system of the diagnostic service, department of radiology, focusing on organizational structure and relationships, patient locator filing system, inpatient scheduling system, x-ray request and report form handling, and the scheduling and utilization of the main x-ray and emergency room x-ray facilities.

Based on this analysis, weaknesses in the existing managerial system will be identified and proposed measures to eliminate these weaknesses will be set forth.

Criteria

The criteria established for this study are:

1. The conclusions derived must be compatible with the other hospital activities and hospital goals.

2. The managerial system proposed must not conflict with the affiliation agreement with Baylor University School of Medicine.

3. The managerial system proposed must not cause organizational changes in other departments.

4. The managerial system proposed will result in better utilization of existing resources and should not require additional resources.

Limitations

The projected study is limited to remaining within the boundaries established by the present physical plant. Minor structural adjustments and possible equipment manipulations will be acceptable.

No recommendation to change the mission of the department or its organizational-functional relationship with the Baylor University School of Medicine shall be made.

Factors Bearing on the Problem

The facts bearing on this problem are:

1. The present area allocated to the department of radiology is insufficient--particularly in the following activities:

a) Patient waiting space.

b) Film storage (filing).

c) Doctors' offices.

d) Secretarial space.

2. The nearness of the x-ray unit in the emergency room to other clinics encourages overuse of this facility.

3. There is a lack of general policies and communication to staff and public on facility utilization.

Assumptions

Following are the assumptions pertinent to the study:

1. The increased use of Medicare-Medicaid will add to the administrative load.

2. The workload within the department will increase as indicated by articles in the literature. For example, in an article discussing workload, Sister Vincent, D.C., notes that, historically, diagnostic procedures double every twelve years and that this, coupled with the increased complexity of studies, puts heavy demand on the x-ray staff to stay abreast of the load.[5] Workload experience at Ben Taub Hospital tends to follow this trend.

3. Although funding in the past has been an extreme hardship, the new hospital district tax structure plus Title XVIII and XIX of Social Security Amendment Act 1965 will greatly relieve this hardship. (Prior to hospital district acceptance the old Jefferson Davis Hospital had an annual budget of $800,000. The current yearly budget has increased to $17.2 million.)

4. The present personnel staffing guides will remain essentially unchanged.

Research Methodology

The first visit to Ben Taub General Hospital was a three-day orientation in February, 1968. During this period much time was spent with Mr. William B. Forster, Administrator, who discussed the Harris County Hospital District and its relationship to Baylor. The problem within the x-ray department was focused upon because of the activity hub it represents to all departments within the hospital. This visit served to familiarize the writer with the plant layout, the general

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[5] Sister Vincent, D.C., "Special Procedures Increases Radiographic Work," Hospital Management, CIII (April, 1967), 29.

history and background of the problem, and the personnel with whom he would later work.

A review of the literature revealed that little attention has been given to the management of the x-ray department in the medical literature. The results of writings concerning organization techniques and general principles from management literature have therefore been utilized.

The second visit to the hospital was for two weeks in May, 1968. This visit was used to further interview the personnel and analyze procedures within the department. The procedure statistics and flow chart diagrams were developed, analyzed, and compared to generally accepted systems within the literature.

Literature Review

As previously mentioned, the references to organization within the radiology department are not voluminous. However, there are enough discussions and works to lend guidance. The usual problem is the inadequacy of the space allotted both in the present and especially for future expansion.

Conceptually there are ideal factors to be sought in the transition from planning to the operational phase. In the planning phase one must forecast the numbers of patients to be served and also survey the economics of the community. Based upon these estimated patient loads, the space and layout of the facility can then be accomplished.

Once a facility has been established, the prime emphasis is then placed upon the organizational structure and managerial techniques to derive the maximum efficiency from the department. The magnitude of the hospital system in the economics of health care is demonstrated by

recognizing that it is the third largest business in the United States.[6] The assets are greater than 19 billion dollars and employment covers 1.7 million people. Hospitals pay out 6.2 billion in wages annually and spend an additional 3.3 billion for goods and services.

There are 7,028 hospitals in the health care system in the United States today. Of this number 74.2 per cent are general acute hospitals containing 57.6 per cent of the total hosptial beds. The remaining 42.6 per cent of the beds are contained in mental (8 per cent of total hospitals) and specialized hospitals (17.9 per cent of total hospitals). Of the acute general hospitals, 63 per cent have less than 100 beds and only 9 per cent have greater than 300 beds. Trends over the past few years reveal an average 6 per cent yearly increase in hospital operating expenses, with the most recent past showing even greater increases.[7]

Within the radiology department, which generally produces 10 per cent of the hospital revenue, the most important person is the chief physician. He should be a graduate of an accredited medical school and have extended his education in a comprehensive general radiology training program. This education gives him the qualification to oversee the professional function of the department. Another function that this chief physician must take a strong interest in is the administration of the department beyond the professional requirements of the position. These

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[6]Herman M. Somers and Annie R. Somers, Medicare and the Hospitals: Issues and Prospects (Washington, D.C.: The Brookings Institution, 1967), p.x.

[7]Thomas P. Weil and Theodore T. Ott, "Management Aspects of the Department of Radiology," Radiologic Technician, XXXVII (May, 1966), 320.

organizational obligations necessary to obtain a smooth efficient operation consist of the following:

1. Organizational chart showing all channels of communication: It is most important that each employee understand his relationships to the organization and other personnel.

2. Sufficient "straw bosses": The span of control should not be extended beyond the limits of control of any one supervisor.

3. Job descriptions: Each employee should be given the opportunity to read this description so he will know what is expected of him.

4. Hospital policy and procedures manual.

5. Departmental policy and procedures manual: It is most important that the operators know the desires and goals of the management.

6. Employee cross-training program: This program builds flexibility and efficiency into the structure so that loss of one person will not cripple the department.

7. Personnel management relations: It is extremely important that the personnel understand the wage and promotion structure of the hospital.

8. Scheduling procedures: Without sharply controlled patient scheduling, long waits develop in the department.

9. Statistics: Statistics of workload and materiel requirements are necessary for the manager to recognize trends and establish priorities. These computations will also improve costing the operation of the department.

10. Analysis of existing service contracts: Evaluating these contracts and assessing their cost and efficiency will provide insight into further changes that can be made.

11. Utilization of semi-annual cost analysis: This utilization is necessary to insure that charges billed at least equal direct and allocated costs.[8]

The above objectives are considered the managerial goals to be implemented in the radiology department. Unfortunately, the progress of obtaining these goals has not kept up with the advancement of medical science. This is aptly presented by Dr. J. O. Daves by his comment in a report of managerial techniques in his hospital: "Whilst medical and technical advances in radiology have proceeded apace, organization within the department and in relation to the hospital as a whole has lagged behind."[9]

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[8]Thomas P. Weil and Theodore T. Ott, "Management Aspects of the Department of Radiology," Radiologic Technician, XXXVIII (November, 1966), 153.

[9]"Order in the X-ray Department," Hospital and Health Management, XXV (October, 1962), 924.

II. DISCUSSION

The Problem as It Exists in the Hospital Organization

Several days of observation, interviews, and study in the diagnostic radiology service of Ben Taub Hospital revealed that the present system within the service is one of expediency and had been derived through multiple uncoordinated decisions over a period of years. The most significant negative force acting within the service is the lack of a proper organizational structure. The people interviewed are all doing their jobs to a reasonably effective degree but are all rather uncertain of authority lines. There is a general air of looseness throughout that implies that strong supervisory guidance is the major ingredient lacking.

The service processes approximately 85,000 patients annually and uses approximately 300,000 x-ray films. This is an average daily patient load of 226, with an average 822 x-ray films processed per day. To accomplish this workload there is a staff of forty-nine full-time employees plus fifteen to twenty student technicians. Several of these staff members will be discussed and mentioned specifically in the remaining discussions as certain specific sub-systems are evaluated.

There is presently no formal organizational chart within the department. The absence of this fundamental document contributes a great deal to the indefinite manner in which administrative matters are handled.

The second most important principle of administration following planning is the proper organization of the enterprise.[10] The organization should be headed up by a trained radiologist who is assisted by a proper number of trained technicians and clerical staff.[11] Only when there is firm organization and proper chain of command can the department run efficiently. Without a strong, competent, and interested leader supported by an equally qualified administrative assistant, the department sinks into confusion and turmoil. Operation of the diagnostic service was so fluid and indefinite that no formal or informal organizational chart or relationships could be developed.

The present situation at Ben Taub is precarious since there is no effective department head. The present department head has resigned, and the governing body of Baylor University School of Medicine is reforming. Accompanying this situation is the concurrent resignation of the designated head of the diagnostic service at Ben Taub. The resignations of these two men are a blessing in disguise for Ben Taub, for the following reasons. The departing deparmental head is first and foremost interested in x-ray therapy and devotes a negligible quantity of time to Ben Taub General Hospital. The departing head of the diagnostic service at Ben Taub, although the chief physician in the department, has so many other commitments that he is not able to give more than one hour a day to the x-ray services of Ben Taub Hospital. Such a situation that

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[10]Harold Koonz and Cyril O'Donnell, Principles of Management (3rd edition; New York: McGraw-Hill, 1955), p. 40.

[11]Malcolm T. MacEachern, Hospital Organization and Management (3rd edition; Chicago: Physician's Record Company, 1957), p. 436.

has so little top level supervision devoted to it is committed to poor management. It is only logical that the chief physician should be present and working in the department at least a major portion of his working day. At present there is such an individual working full time within the department. This physician is motivated and interested in the diagnostic services of Ben Taub and is present full time to oversee and manage the department. The previously mentioned affiliation agreement between the Baylor University Medical School and the Harris County Hospital District makes it possible for a physician other than Baylor's departmental head to be named to this position.

Having interviewed at length all the key personnel within the operational control of the department, the writer was left with the unequivocal impression that all parties are somewhat frustrated and bitter at the absence of tangible improvements which have been promised. Because of the lack of strong leadership, the department over the years has developed a system of services which accomplish the mission but in a disjointed manner without complete communication. Much of the problem is developed from the political background and history of the hospital. The chronic lack of funds has necessitated lower wages and, in particular, inadequate equipment and maintenance. With the adoption of the hospital district in 1965, income for running the hospital increased and, coupled with Medicare-Medicaid, gave hope for allowing progress through funds which have so long been absent. This partially explains the weak leadership in the past. Without proper funds, quality leaders cannot be obtained, and the organization becomes inefficient. Ben Taub, as the major hospital in the Harris County Hospital District, is now in the phase of

regrouping and attempting to stabilize the leadership within its walls. The present state of affairs has had thirty plus years to develop and should not be expected to correct itself in a matter of one or even several years.

The deficiencies in organizational structure and relationships and in the attendant controls explain much of the difficulties experienced by the diagnostic radiology service. However, there are other aspects of the service that impede efficient operation. These include inpatient scheduling, x-ray request and report forms, patient locator filing system, typing support, chest x-rays, and utilization of the emergency room x-ray facility.

Inpatient scheduling

Study of patient flow and waiting times within the service reveals a pattern comparable to any hospital. The daily patient load for the months of January-April, 1968, reveals nearly a 24 per cent increase over the comparable period of the preceding two years. Inpatients account for approximately 27 per cent of the daily workload; scheduled outpatients make up approximately 35 per cent; and emergency room patients approximately 38 per cent daily. The current average daily patient load is 280, an impressive workload under any circumstance.

Inpatient scheduling is beset by two major problems. The biggest problem is queuing and is related to cooperation, communication, and scheduling. The movements involving inpatient flow are depicted in Appendix C. As can be seen, the problem areas are on either end of the flow. The unreliability, both of the ward personnel sending the patients

upon call and the x-ray department not processing the patient upon arrival, comes from lack of accurately following a scheduling system. This causes the queuing of the arrival and processing of patients within the department.

Another problem caused in part by the waiting time for inpatients is the tying up of personnel who must accompany any pediatric patient and remain with the child while the child is in the x-ray department.[12]

X-ray request and report forms

After considering the management of the patient within the department, attention was turned to the administrative handling of the request form from receipt at the front desk to the preparation and distribution of the separate report forms. Appendixes C and D represent these procedures diagrammatically. Analysis of these two charts reveals the redundancy of having separate request and reporting forms.

Filing and processing

The clerical processing of requests at the front appointment desk reveals two weaknesses. The first is the lack of adequate patient locator filing cabinets. The present filing system is quite crowded, and some

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[12]One observation that leaves the writer uneasy is the present procedure of returning patients to their ward. Two orderlies supplied by housekeeping department are presently used both to pick up from and deliver patients to their wards. When they bring a patient to the department, they deposit him directly to the assigned diagnostic room. Here the technician takes over. However, upon completion of the procedure, the patient is placed out in the corridor unattended to wait for the orderly to return him to his ward. This procedure leaves a patient completely unattended for an indeterminate time and is considered dangerous to say the least. There should always be a direct transfer of responsibility to protect the patient and the hospital in case of accident.

drawers are exceptionally crowded. The calculated maximum capacity of the present files is 120,000 patient locator cards. The files are presently approximately 80 per cent full. Access to the cabinets in use is time-consuming and difficult.

The second deficiency is the handling of the x-ray requests at the front desk. The reception desk is normally staffed by three clerks, each of whom carries the procedure completely through from request presentation until the request is vacuum tubed to the chief technician. When the patient load is light, this is of no concern. In periods of heavy patient load, such a procedure delays processing of requests and thereby increases waiting time.

Typing support

After the patient has been x-rayed, the films have been checked for technique, and the radiologist has reviewed the study and released the patient, the activity of obtaining the final report is initiated. This activity chart is shown in Appendix D. Once the radiologist has read the films and dictated his report, the medical typist picks up the tapes and request forms. These tapes are placed in a receptacle and typed out by the four girls in the medical typist pool. At the present time the reports are up to date, but there are times when they fall far behind.

Aside from the usual hazards of absenteeism of the typists, three significant adverse time-consuming activities in this area are present. The first is the requirement for one of the typists to take the morning daily admissions roster and retype it alphabetically preparatory to cross-checking it against the x-ray requests from the emergency room. This is

done to determine which patients' reports go to medical records or to one of the wards.

The second time-consuming procedure is the previously mentioned separate report form. Presently the girls must type the patient's identification from the request to the report form. This is unnecessary duplication of effort. Also, the present report form will not contain the original clinical summary.

Finally, and possibly most important, is the decrease in efficiency wrought by a new typist unfamiliar with medical terminology. Until this typist becomes fully familiar with her position, her output is significantly below that of the experienced typists.

Chest x-rays

In the discharge of its services to any hospital the radiology department has a significant portion of the workload made up of chest x-rays. At Ben Taub the problem of adequate facilities for taking chest x-rays is acute. Essentially, the relatively simple chest x-ray procedure is not distinguished from other more complex procedures, making scheduling extremely difficult.

Emergency room x-ray facility

Presently the emergency room x-ray facility is isolated from the main department. The present services system within the emergency room is essentially a duplication of the main department. When a patient is referred to the emergency room x-ray facility from either the emergency room, pediatric clinic, or outpatient department, he is logged in on the

registry book and processed in the usual manner. From this technique arises one great problem.

Each morning all the x-rays taken in the emergency room x-ray facility on the preceding day are picked up and brought to the main department for filing. All of these films have been read, and the report has been dictated by a radiologist before leaving the emergency room x-ray unit. There is no problem with proper handling of the reports as they are given first priority by the medical typists each day. The problem is in the complete "registration" of all patients x-rayed the preceding day. The chief clerk cross files only from the actual films that come up to the main department. This allows a certain number of x-rayed patients to be missed in filing because for one reason or another their films did not come up to the main department. If the registry log from the emergency room x-ray facility were to be utilized for this morning cross filing, none of the patients would be excluded.

The counter argument to this procedure was defined by the chief clerk of diagnostic service. She points out that frequently the films that do not come up in the morning never do reach the department. For this reason some disagreement develops later when the patient is again x-rayed and there are no films to deliver to the doctor for comparison. For this reason she prefers never to initiate these records. Although there may be some merit to this argument (especially when dealing with some difficult doctors), it is felt the only proper method is to log in all patients as taken. There already is a significant problem with the patient identification number system in the hospital. This is not isolated to x-ray only and consists mainly of patients with two or more

numbers or conversely two or more patients with the same number. The system is based upon terminal digit filing, and number assignment is from medical records. Although not within the scope of this study, the patient identification procedure needs clarification and closer control.

Proposed Measures to Improve the Managerial System

Organization

The foremost action deemed important to rectifying the department's lack of efficiency is the appointment of a physician present full-time to oversee and manage the diagnostic service. As discussed earlier, a qualified individual is assigned to the service and available to perform this necessary leadership and control function. Such a positive action would give the personnel within the department the needed leader to gather and organize them into an efficient organization.

A strong organizational structure must be established. A feasible structure is suggested in Appendix E. An integral part of this structure is the appointment of a knowledgeable and aggressive radiology manager to assist the chief in the administration and smooth functioning of the service. The radiology manager would serve basically as an administrative assistant, guiding the day-to-day functioning of the service.

Inpatient scheduling

A rational scheduling system that could be feasibly applied to Ben Taub Hospital is discussed in an article written by Kanon.[13] A

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[13]Dov Kanon, "Scheduling System for X-rays Prevents Overtaxing of Facilities," Hospitals, XXXXI (January, 1967), 88.

master schedule is developed for the department based upon a daily computation of maximum available times. The number of rooms and technicians available are multiplied by the total number of minutes in the working day. The lesser of these two numbers is the day's allotted time. Based upon this time figure, the patients are scheduled by procedure to fill the day. The weighted unit of time for each procedure is calculated by the following formula:

$$\frac{T \times AR}{AR} = \text{Weighted Unit of Time}$$

Where: T = Average time to perform each procedure

AR = Total annual frequency for each procedure

The adoption of such a scheduling technique for the prescheduling of special procedures on inpatients would soon show a marked improvement in the queuing problem within the department. This new consistency would reflect in renewed cooperation from nursing personnel as soon as they realize the patient flow has smoothed.

X-ray request and report forms

Adoption of a single form to be used both for requesting x-rays and reporting upon results would reduce by one-half the work required in preparing x-ray reports, primarily by eliminating the typing of patient identifications onto a separate request form. Such a form would retain the heading used at present (heading is the same on both request and report forms) to permit continued use of addressograph imprinters. The presently used request form is printed on an IBM sized card and is identical in size to all forms used within the hospital. This is to facilitate processing in the accounting office.

A combined x-ray request/report form, with sufficient space for both pre and post x-ray data, and on the appropriate size card, is feasible and is a rational solution to reduce duplication of work. The proposed single form would have four parts; patient record copy; x-ray film jacket copy; x-ray file copy; and business office copy in IBM card form.

Filing and processing

Two choices are available to solve the overcrowding of the present filing system. The first is the addition of filing cabinets similar to the cabinets in use. Although there is sufficient room for addition of cabinets, continued expansion to meet ever-increasing file space needs is not possible. Further, the time-consuming and difficult access to the filing cabinets would not be significantly altered.

The second choice is conversion to power filing, such as Diebold power files. There is adequate space to accept a power filing system and such a system would provide sufficient space for present and future filing requirements, as well as reduce access time. Should the system be changed, it would require either a brief intensive period of transferring the present filing system or a more protracted and overcrowded period while both systems are used and the current filing system is eliminated through attrition.

Processing of the x-ray request forms would be facilitated by having each girl at the desk carry out a specific portion of the activity. In other words, divide the processing of each request among the girls. Such a system would reduce wasted movement in the processing area and increase effectiveness by reducing request processing time. Such a change

would alleviate the present tendency for requests to build up prior to distribution to the chief technician. Smoothing of the flow of requests would also aid in stabilizing patient flow.

Typing support

The adverse time-consuming activities of retyping the admissions roster, preparation of a separate x-ray report form, and use of new personnel can be alleviated by the following actions.

The admissions roster could be alphabetized at the originating point of admissions, the admitting area. Other activities in the hospital require alphabetized rosters. It appears simpler to have it typed in the admitting area with sufficient copies rather than several times by typists in different departments of the hospital.

The use of a combined x-ray request/report form, previously discussed, would eliminate the time-consuming procedure of typing a separate form. Post x-ray data would be transcribed directly on the combined request/report form.

The decrease in efficiency wrought by a new typist can be alleviated through some form of schooling in medical terminology prior to starting work. Contact with local business colleges or some organized school using medical students to teach typists medical terminology is suggested as a possible answer. The typists could be hired and trained while on the payroll. This would increase motivation on their part. It should be so contracted that the typist becomes obligated to the hospital once trained to forestall her leaving for a better position immediately.

Chest x-rays

In a long and detailed discussion of this problem with the chief technician, it developed that installing another diagnostic room specifically for chest x-rays would decrease patient waiting time by approximately 50 per cent for chest patients. Further discussion was held with the medical instrument chief to determine the possible site and feasibility of such an installation. His recommendations would place a unit with a photo-timer in one of the present front offices. Such placement would accelerate entry and exit of patients not requiring dressing room facilities. The author understands arrangements along these lines are under consideration and submits his endorsement to rapid completion of such plans.

Emergency room x-ray facility

The change considered most productive of increased efficiency would be the installation of an effective inter-communication facility. Although the use of the existing emergency room log for cross filing appears superficially to be an answer, the problems of its use as previously discussed would impede its effectiveness.

By installing a functional inter-communication system between the emergency room x-ray facility and the main diagnostic facility, this entire problem could be bypassed by checking the patient records and logging the patient in from the beginning at the main diagnostic facility. Under this procedure, the patient would be recorded in the main facility initially and dual logging would be eliminated. The success of this procedure would depend upon the cooperation of the users and the clarity of voice transmission by the electronic system.

Summary

This discussion has purposely dealt with many facets of the diagnostic radiology service of Ben Taub General Hospital. The techniques and procedures discussed are each separate activities that make up the whole. To point up the obvious major deficiencies within the department was the goal and the conclusions and recommendations are based upon the overall managerial concept rather than a simple mechanical analysis of any one function.

The development of organizational structure and a definite, clear-cut knowledge of limits of responsibility, authority, and accountability are the answers to increasing departmental efficiency. In the past the absence of primary leadership within the department has contributed to poor coordination and cooperation with those administering the hospital. Considering the general statistics there are adequate personnel to accomplish current and projected workload once more supervision and control is initiated.

Due to past austere budget limitations the general status of equipment is only tolerable, and renovation and replacement to improve delivery of service rates high priority. Increased budget for operation and equipment updating has occurred since the new hospital district was adopted.

Administratively tying together the several subsystems, as recommended in this paper, will increase the overall efficiency of the department. The use of separate forms for pre- and post-x-ray data is redundant. The system of separate logging of patients in the main department and emergency room represent duplication of effort. Lack of a separate unit

for taking chest x-rays causes increased waiting throughout the department. The filing system is overcrowded and inconvenient. Typing and clerical support is hindered by improper division of work, duplication of typing, and untrained employees.

The present inpatient scheduling system does not recognize the limitation of total daily time available for accomplishing the workload and gives rise to long waiting periods.

There is general lack of capacity for complete and rapid communication between the various areas of the department. All areas are intimately dependent upon each other, and communication is presently based on telephone utilization or individuals walking to the area concerned. Therefore, much time and motion is wasted within the x-ray department.

III. CONCLUSIONS

The most effective managerial system of the diagnostic service of the radiology department, Ben Taub General Hospital, Houston, Texas, is a summation of changes in management as developed in this paper. Appointment of a head of the department who is actively interested in the management of the department and the service rendered is required first. To accomplish this task a strong organizational structure of functional personnel guided by a knowledgeable and aggressive radiology manager must be developed to assist the chief radiologist (Appendix E).

The present reporting forms are redundant.

The present registering system of patients requires duplication in several areas.

The current central patient register file is overcrowded and needs either increased space or consideration of adopting a more functional system.

There is need for adopting a patient scheduling system which utilizes to the maximum the available facilities.

The absence of communication capability within the department necessitates much unnecessary motion and delay in patient film processing.

Finally, the best summation of the problem as a whole is the past absence of leadership to coalesce and guide the personnel in these many areas.

Recommendations

To correct the foregoing organizational deficiencies, these recommendations are submitted for consideration.

1. That a chief physician be appointed as chief of the department who is present within the department full-time and has a strong interest in the management of the department. This physician would be totally responsible for the management of the department and coordination between the chief, department of radiology, Baylor University School of Medicine and the Administrator, Harris County Hospital District.

2. That a single form be adopted which will combine the present request form and the present report form and will also serve as a business office record.

3. That a functional inter-communication system be installed to link the operational areas together.

4. That consolidation of the multiple "logging-in" areas be to the main reception desk. (Predicated upon recommendation #3.)

5. That the central patient file be transferred into a Diebold rotatory file system by attrition to facilitate recovery speed and future expansion.

6. That a time and motion study be conducted of processing of requests at the reception desk to improve patient scheduling.

APPENDIX A

EXTRACT OF AFFILIATION AGREEMENT

APPENDIX A

E X T R A C T

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6.

APPOINTMENT OF MEDICAL STAFF

Appointments to the Medical Staff of the Hospitals and any such other facilities operated by the District and staffed by Baylor shall be made annually by the Board of Managers of the District only upon the recommendation of the Medical Board of the Hospitals, which shall be appointed by Baylor and approved by the Board of Managers of the District.

7.

CHIEFS OF DEPARTMENTS

The District shall appoint as chiefs of the departments, services or divisions of the Hospital Medical Staff the corresponding chairman or chief officers of the departments or divisions of Baylor; provided further that, upon nomination by Baylor, members of the Medical Staff who are not chairmen or chiefs at Baylor may be appointed by the District as Chiefs or Deputy Chiefs of hospital services, departments or divisions.

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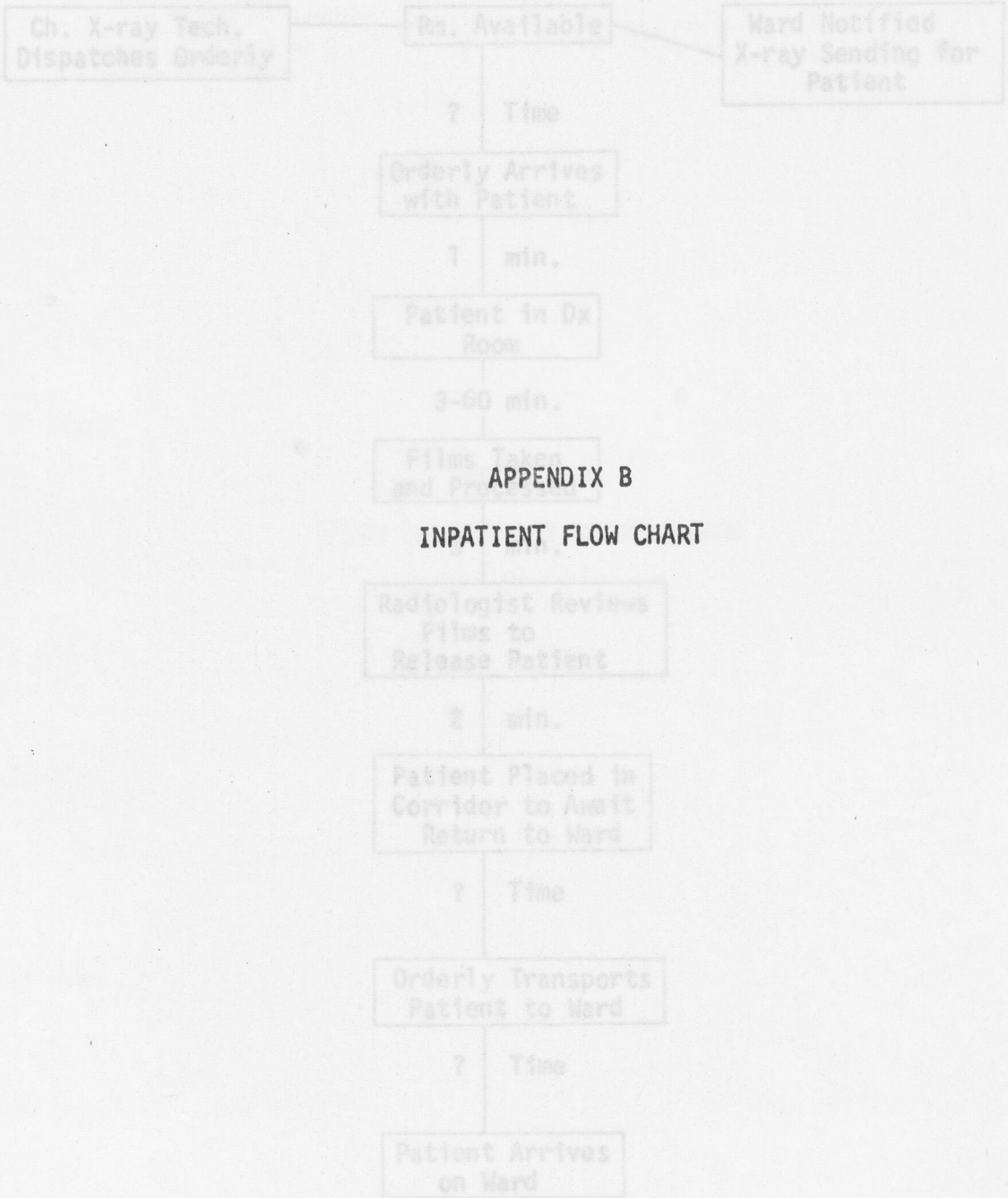
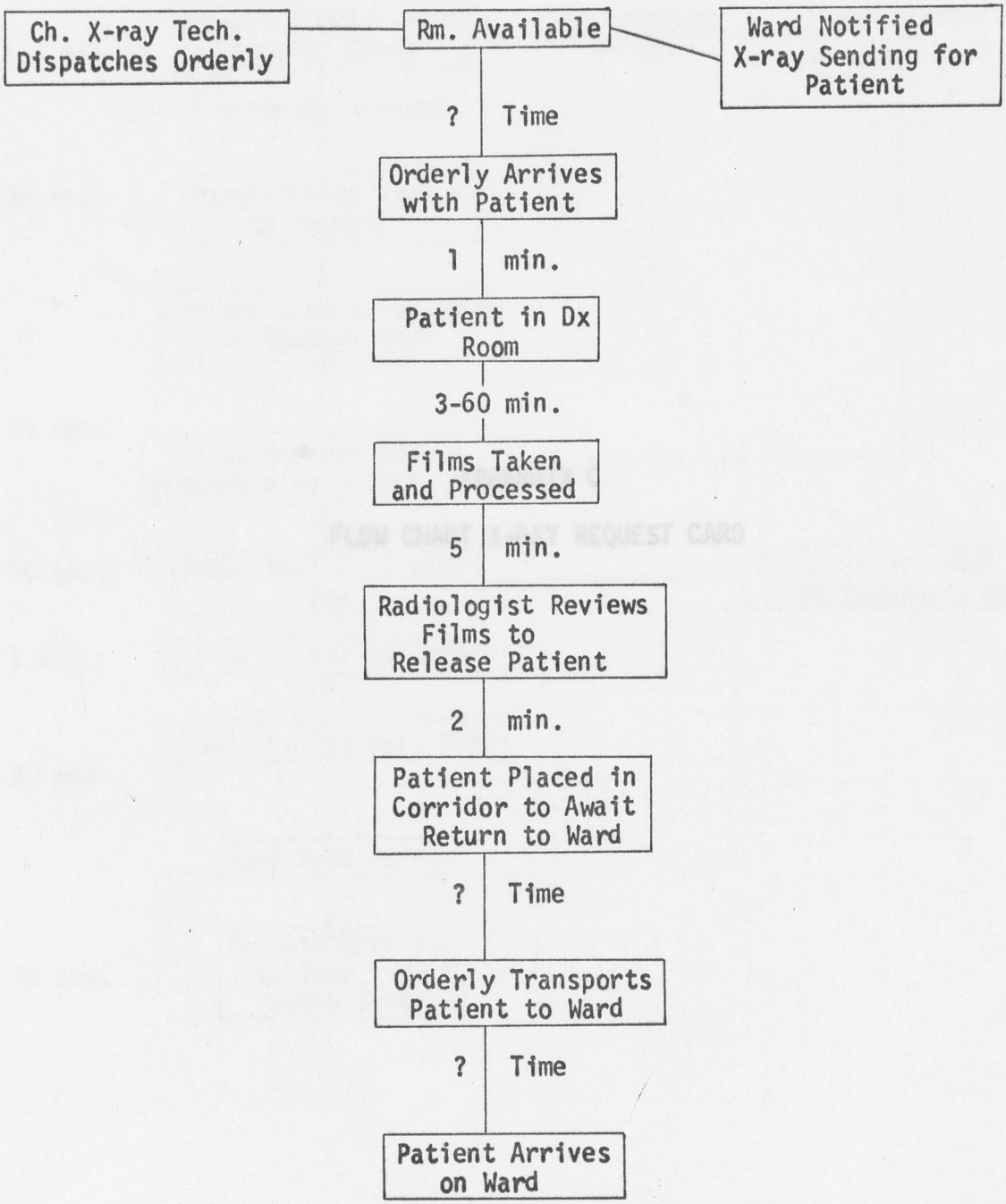
APPENDIX B

INPATIENT FLOW CHART

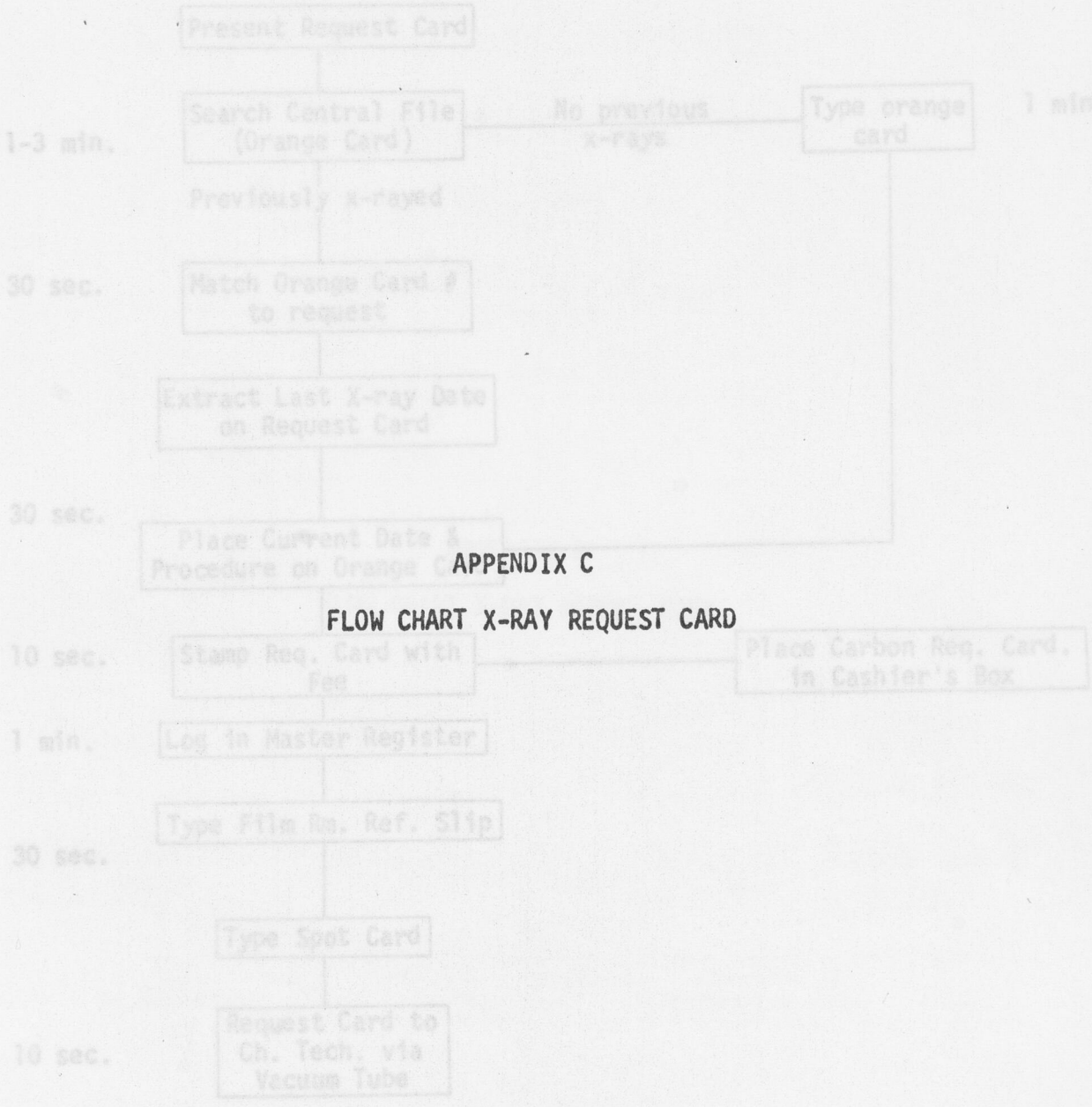


APPENDIX B - INPATIENT FLOW CHART

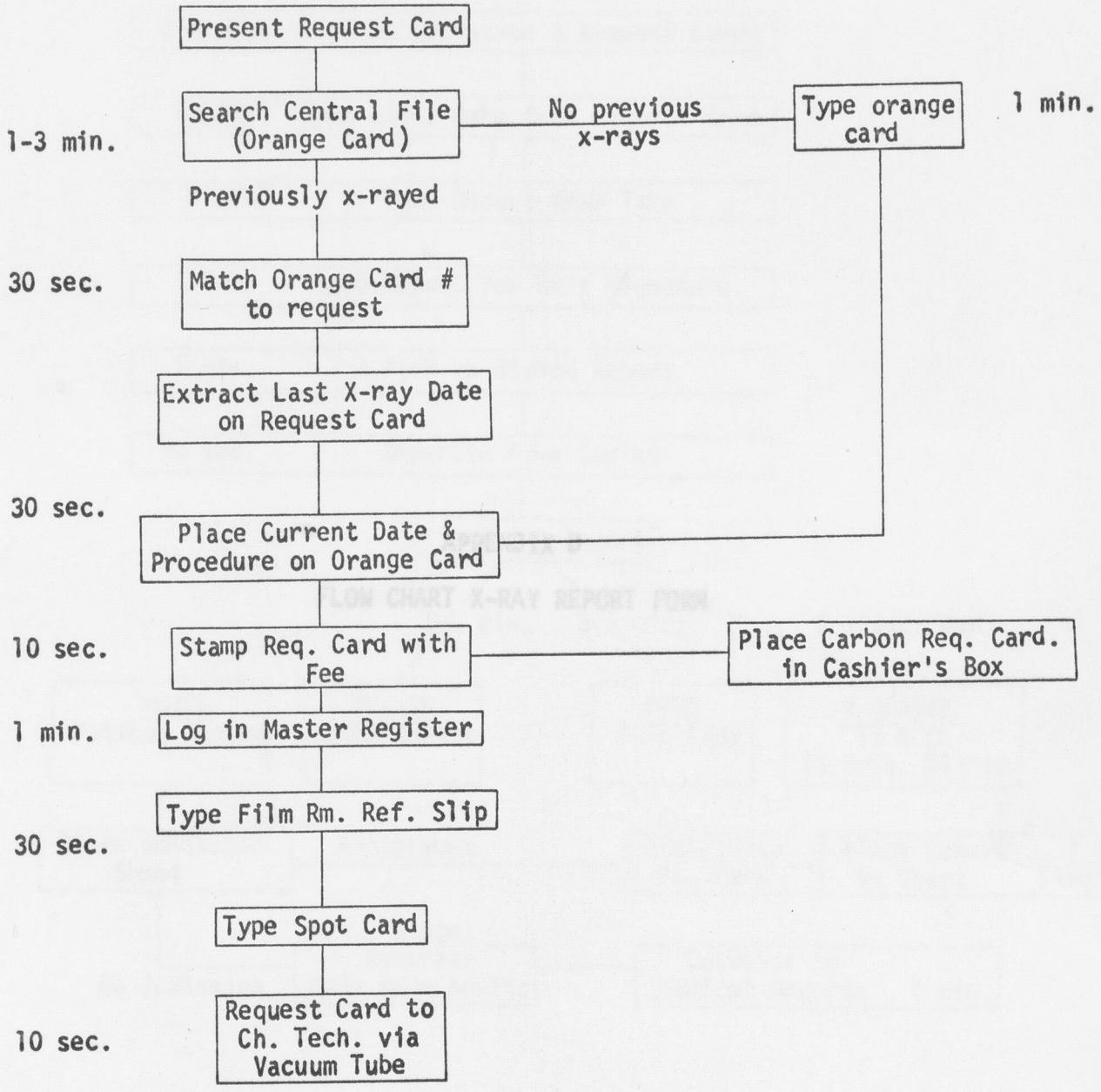


APPENDIX C

FLOW CHART X-RAY REQUEST CARD

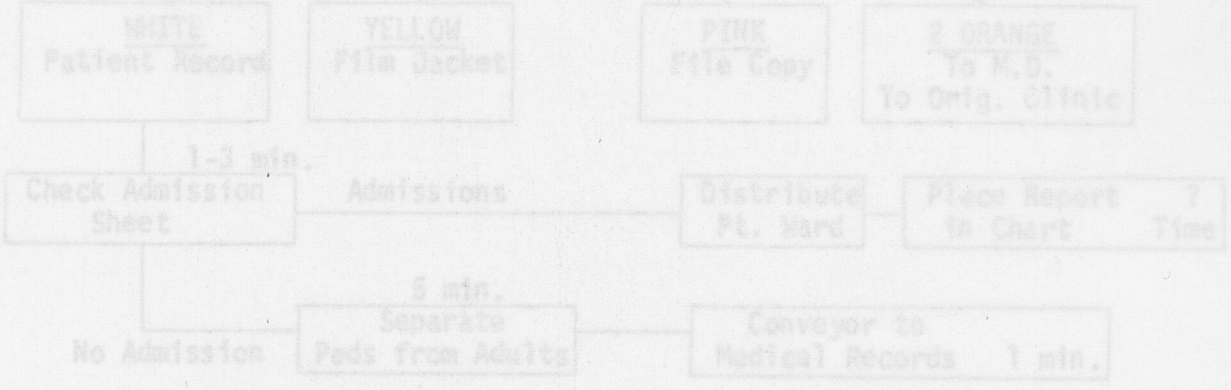


APPENDIX C - FLOW CHART X-RAY REQUEST CARD

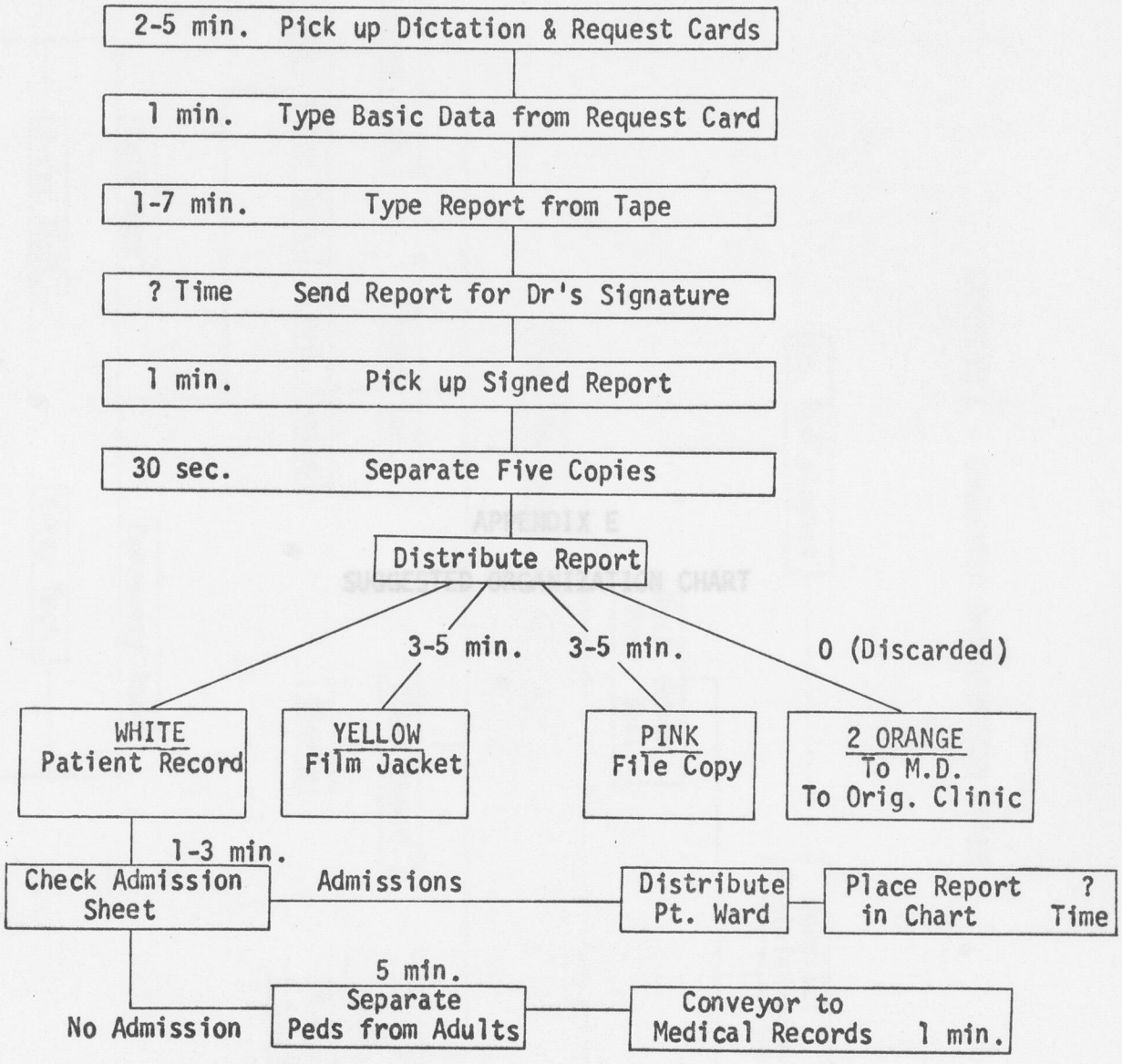


APPENDIX D

FLOW CHART X-RAY REPORT FORM

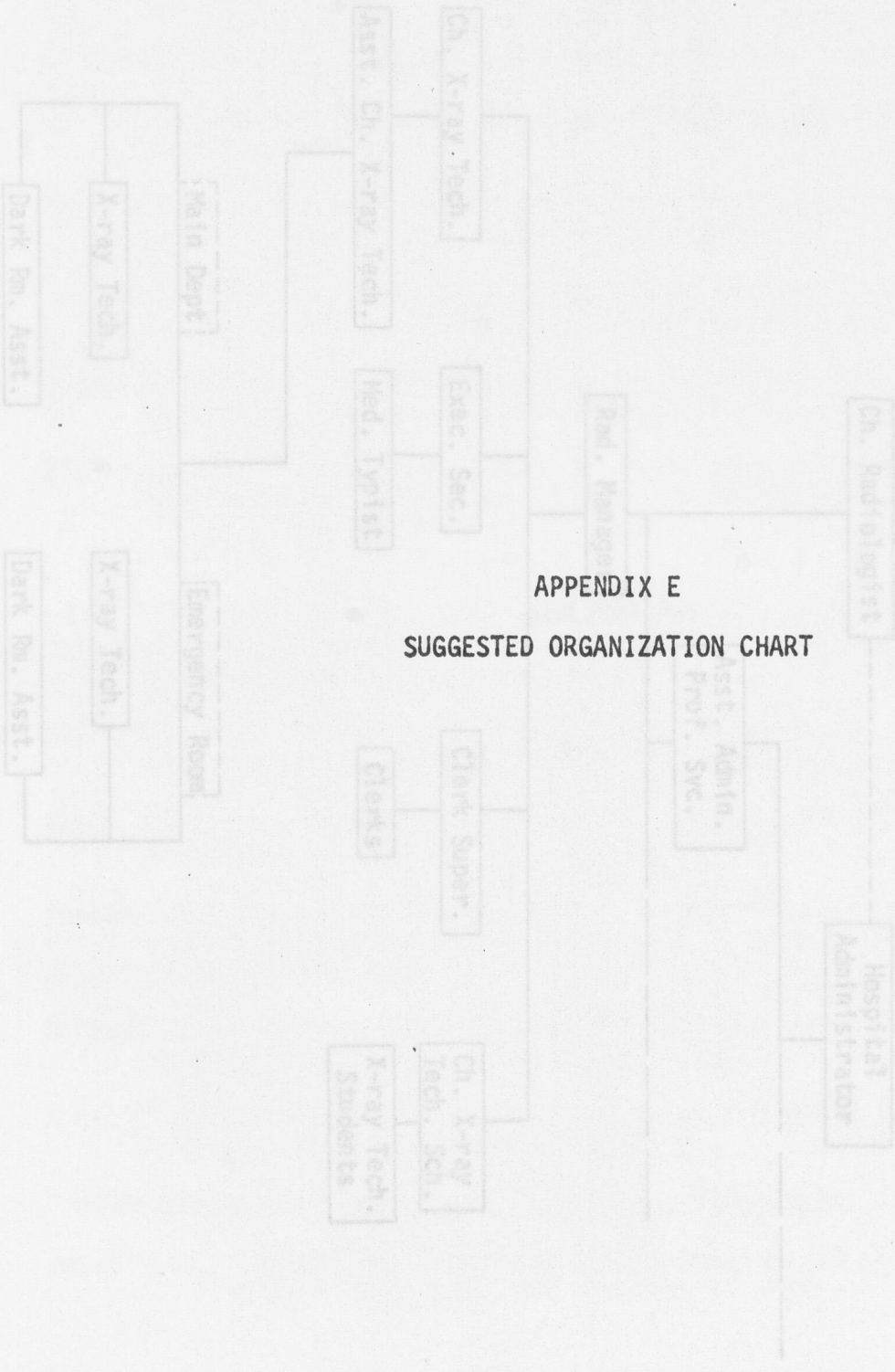


APPENDIX D - FLOW CHART X-RAY REPORT FORM

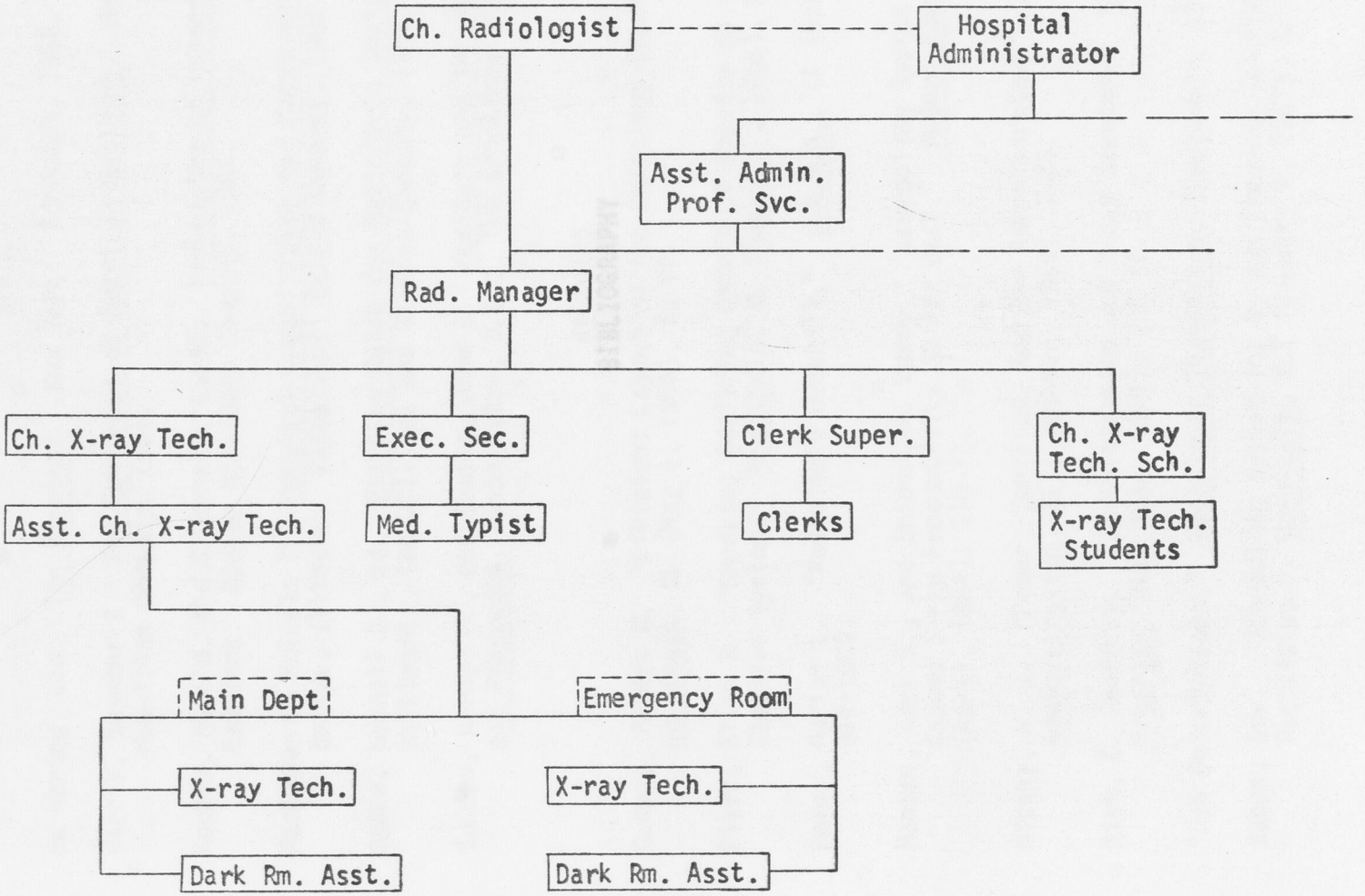


APPENDIX E

SUGGESTED ORGANIZATION CHART



APPENDIX E - SUGGESTED ORGANIZATION CHART



BIBLIOGRAPHY

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Books

de Hartog, Jan. The Hospital. New York: Atheneum, 1964.

Harris, Seymour E. The Economics of American Medicine. New York: The Macmillan Company, 1964.

Koontz, Harold, and O'Donnell, Cyril. Principles of Management. 3rd ed. New York: McGraw Hill Book Company, 1964.

MacEachern, Malcolm T. Hospital Organization and Management. 3rd ed. Berwyn, Illinois: Physicians' Record Company, 1962.

Scott, Wendell G., ed. Planning Guide for Radiologic Installations. Baltimore: The Williams and Wilkins Company, 1966.

Somers, Herman M., and Somers, Anne R. Medicare and the Hospitals/Issues and Prospects. Washington, D.C.: The Brookings Institution, 1967.

Articles

Cadmus, Robert R. "Efficient Layout of the Radiology Department." Hospitals, XL (May 1, 1966), 63 ff.

Clark, Bliss B. "Choosing Qualified Chiefs of Service by an Appointive-Elective System." Hospitals, XL (August 1, 1966), 80 ff.

Daves, Marion L. "Radiologic Overkill." J.A.M.A., CC (June 12, 1967), 999-1000.

Hansen, Karl E., and Snider, R. Larry. "Scheduling System Shows Way to Expand X-ray Productivity 30 Per Cent." Modern Hospital, CII (April, 1964), 110-12.

Hickey, W. J. "Power, Conflict, and the Administrator." Hospital Administration, XIII (Winter, 1968), 7-25.

High, E. Goeffrey. "Administration and X-ray Service." Hospital Progress, XLVI (May, 1965), 126 ff.

"Job Descriptions." Radiologic Technician, (September, 1967), 65-9.

Kanon, Dov. "Scheduling System for X-rays Prevents Overtaxing of Facilities." Hospitals, XLI (January 1, 1967), 87-9.

Articles (Continued)

Mechanic, David. "Sources of Power of Lower Participants in Complex Organizations." Administrative Science Quarterly, VII (December, 1962), 349 ff.

"Order in the X-ray Department." Hospital and Health Management, XXV (October, 1962), 923-24.

Owen, Morris, and Forster, John L. B. "Five Forms Streamline the X-ray Service." Modern Hospital, XCIV (March, 1960), 120-22.

Shapiro, Jerome H. "Radiology Department Doubles Its Reporting with Power Typewriter." Modern Hospital, CVII (October, 1966), 82-3.

Sister Vincent, D.C. "Special Procedures Increase Radiographic Work." Hospital Management, CIII (April, 1967), 29-33.

Templeton, Arch W.; Lodwick, Gwilym S.; and Turner, Arch H. "Radiate: A New Concept for Computer Coding, Transmitting, Storing, and Retrieving Radiological Data." Radiology, LXXXIV (November, 1965), 811-17.

Weil, Thomas P., and Ott, Theodore T. "Management Aspects of the Department of Radiology." Radiologic Technician, XXXVII (May, 1966), 320-23.

Weil, Thomas P., and Ott, Theodore T. "Management Aspects of the Department of Radiology." Radiologic Technician, XXXVIII (November, 1966), 153-56.

A STUDY TO DETERMINE THE MOST EFFECTIVE MANAGERIAL SYSTEM FOR THE DIAGNOSTIC SERVICE, DEPARTMENT OF RADIOLOGY, BEN TAUB GENERAL HOSPITAL, HOUSTON, TEXAS

LTC Donald L. Ellis

41 Pages August, 1969

ABSTRACT

The problem was to determine the most effective managerial system for the Diagnostic Service, Department of Radiology, Ben Taub General Hospital, Houston, Texas.

Research included a detailed review of the literature, analysis of x-ray procedures at the hospital, and personal interviews with x-ray department personnel and with selected nursing and administrative staff. Flow charting of x-ray activities and collection of workload statistics was accomplished.

The major weaknesses in the diagnostic service were the lack of a full-time chief physician, ill-defined organization structure, duplication of forms, overcrowded filing system, duplication in patient registration, inefficient patient scheduling, and lack of communication capability between x-ray facilities.

Recommendations were: appointment of a chief physician; combination of request and report forms; installation of an inter-communication system; consolidation of patient registration; use of Diebold rotatory filing system; and revision in patient scheduling.