

AN EVALUATION OF THE EFFECTIVENESS OF GENERAL  
AND DIETARY STOREROOM OPERATIONS AT BAYLOR  
UNIVERSITY MEDICAL CENTER, DALLAS, TEXAS

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CHAPTER 1

INTRODUCTION

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The health care industry is confronted with a multitude of problems which were brought about primarily by the prevailing philosophy of the health care industry and not a provision. One of the major problems is the rapidly increasing costs of operation. This problem has become the major concern of the hospital administrator due to mounting pressure being exerted by the health care consumer, the federal government, and third party payers. Costs must be contained without sacrificing or reducing the quality of care that is provided.

Due to these pressures and the rapidly increasing inflationary trend of hospital costs, the hospital administrator is devoting more effort than ever before to reducing operating expenses. The majority of health care studies and reports show that personnel costs are the largest and most significant portion of the hospital budget. The second most costly area concerns the materials which are used in the day-to-day operations.

Labor costs, generally speaking, are controlled primarily by sources or factors beyond the influence of the hospital. In light of this fact, greater emphasis is being placed on controlling the costs

## CHAPTER I

### INTRODUCTION

#### General Information

The health care industry is confronted with a multitude of problems which were brought about primarily by the prevailing philosophy that health care is a "right" and not a privilege. One of the most significant problems is the continually rising costs of operations. The solution to this problem has become the major concern of the hospital administrator due to mounting pressure being exerted by the health care consumer, the federal government, and third party payers. Costs must be contained without sacrificing or reducing the quality of care that is provided.

Due to these pressures and the rapidly increasing inflationary trend of hospital costs, the hospital administrator is devoting more effort than ever before to reducing operating expenses. The majority of health care studies and reports show that personnel costs are the largest and most significant portion of the hospital budget. The second most costly area concerns the materials which are used in the day-to-day operations.

Labor costs, generally speaking, are controlled primarily by sources or factors beyond the influence of the hospital. In light of this fact, greater emphasis is being placed on controlling the costs

of materials. Thus supply functions, as well as supplies used, are receiving critical attention from the administrator in an attempt to reduce costs by providing more efficient and effective material services. The purchasing, the storing, and the distributing of supplies are the three major functions of material services that need to be evaluated on a continuing basis if supply activities are to be performed efficiently and effectively.

The Baylor University Medical Center is no exception and its desire to provide high quality medical care at the lowest cost has prompted this study of the Center's storeroom operations.

#### Hospital Setting

A simple hospital that was built in 1903 continually grew, expanded, and in 1959, after several name changes, became the Baylor University Medical Center. The Good Samaritan Hospital, established in 1903, was the actual beginning of this modern, multipurpose community health institution.

The Center is a nonprofit, Baptist-controlled institution which has 1,125 beds and occupies about seven city blocks in the northeastern section of Dallas, Texas. It is the second largest church-related hospital and the seventh largest voluntary general hospital in the United States. In fiscal year 1974 the Center had 37,130 admissions and 4,267 births. Of the more than twenty short-term hospitals located in the Dallas area, the Center had the most admissions and was second in the number of deliveries.<sup>2</sup>

Baylor University Medical Center is comprised of five separate but physically interlinking hospitals: Veal, Truett, Hoblitzelle, Jonsson, and Collins. In addition to these hospitals, other buildings of the Center are the Medical Plaza, the Medical Library, the Center for Continuing Education, the Baylor Dental School, the Wadley Research Institute and Blood Bank, and the Wilma Bass Memorial Hall, a dormitory for nursing students. A map of the Center is in Appendix A.

Baylor University Medical Center continues to expand in order to meet the everchanging health care needs of its service area population. In March 1975, five new operating rooms for ophthalmological cases were opened in the Collins Hospital. A Cancer Center is under construction and scheduled for completion in September 1975. Construction of a Heart Research and Treatment Center is also planned. When present plans are completed, Baylor University Medical Center will be comprised of more than 1,250 operating beds.

This vast expansion has caused internal problems, especially concerning the supply functions of storage and distribution. The major problem is the result of insufficient provision for the needed growth of the storage capabilities. There is an obvious lack of space for the storage of general and dietary supplies. Despite the expansion, the storerooms are in the same area they occupied more than fifteen years ago. In fact, the amount of available storage space has decreased since a portion of this area was used to accommodate the expansion of communication wiring and transfer devices.

The growth of the Center has also caused a significant problem in the distribution of supplies. Because of the separate buildings and hospitals that have been added, supplies must be moved over fairly long distances and up and down relatively steep inclines. Unless plans are made and implemented to alleviate the situation, these problems will become more serious as the Center completes present expansion programs and begins new ones.

#### Conditions Which Prompted the Study

The Baylor University Medical Center has historically demonstrated a desire to review and reevaluate its various operational systems to ensure that they are efficiently and effectively accomplishing their mission.

The stores' function, which includes the distribution of supplies, was an area of concern. Some adjustments in the staffing of the general and dietary storerooms and in the patterns of distribution had been made; however, the administration felt that further evaluation of the situation was needed. It was this need that prompted this study.

#### Statement of the Problem

The problem was to evaluate the effectiveness of general and dietary storeroom operations at Baylor University Medical Center, Dallas, Texas, and to recommend methods of improvement.

### Objectives of the Study

The objectives of this study were:

1. To compare present storeroom activities with those presented in the literature as "normal" storeroom functions.
2. To evaluate the storerooms on the basis of the following standards: maximum use of space, effective and efficient use of labor and equipment, easy access to all items, efficient movement of goods to and from the storeroom, maximum protection of goods from pilferage and deterioration, and accuracy of inventory records.
3. To determine user satisfaction with the effectiveness of the supply system in responding to their needs.
4. To determine if staffing is adequate to accomplish the workload of the dietary and general storerooms.

### Criteria

Any proposed changes and recommendations should:

1. Be compatible with the mission, goals, objectives, policies, and procedures of Baylor University Medical Center.
2. Improve the efficiency and effectiveness of the storeroom operations.

### Limitations

The following limitations had a bearing on this study:

1. It was beyond the scope of this study to determine if an automated distribution system was cost-justifiable and possible at the

Center. An automated material distribution system capable of handling all material was therefore not considered as a possible alternative.

2. The use of motorized or semi-automatic carts to distribute supplies was not a feasible alternative since the movement of the carts through heavily congested areas would be hazardous.

#### Assumptions

For the purpose of this study the following assumptions were made:

1. The workload of the two storerooms would increase.
2. Additional staffing requirements would be satisfied if needed.

#### Facts Bearing on the Problem

The following facts had a bearing on this study:

1. Storeroom space was not adequate to meet the needs of an institution as large as Baylor. This was the overriding problem that had to be resolved or the difficulties would continue in storeroom operations.
2. Standards or criteria by which to measure the effectiveness or efficiency of storeroom operations were absent. Also lacking were guidelines set forth in the literature to determine the number of personnel required to accomplish storeroom functions.
3. When fully operational, the new Medical Plaza and the new operating rooms in the Collins Hospital would increase the workload of the storerooms. The eventual increase in the number of beds in other

portions of the Center and the opening of the Cancer Center would further increase the workload.

### Methodology

The first phase of this study dealt with a review of the literature to discover: activities generally accepted as storeroom operations, the various modes and methods of supply distribution used in medical facilities, and any standards or criteria against which performance and staffing could be measured. A general review of the literature dealing with material services was also made to ensure familiarity with the interactions that take place, internal and external, in the material department.

The second portion of the study entailed a two-week visit to the Baylor University Medical Center to gather data and observe the performance of storeroom operations.

Interviews were conducted with various staff members to determine if users felt there were any problems in the present supply system and the changes, if any, they would like implemented. Discussions were also held with the purchasing director, the storeroom manager and personnel, and the director of material services.

Written policies, procedures, and job descriptions for the storerooms were reviewed. The intent was to determine if work was being performed in accordance with prescribed guidelines.

Reports were reviewed and tests performed to determine inventory accuracy; high usage items; storeroom layout; out-of-stock

percentages; demand accommodation; fill-rate; workload data; and similar information. The paperwork flow associated with storeroom functions was also examined.

Time studies were conducted to arrive at average times required to perform the various storeroom operations so that staffing needs could be determined. Work history was reviewed to ascertain the number of hours worked by storeroom employees and to determine their productive time.

#### Review of the Literature

Every medical facility, regardless of size, requires numerous and varied materials to accomplish day-to-day operations and to achieve the primary mission of treating patients. The material management system is an integrated approach to ensure that items of the right quantity, quality, and price are available to the user at the appropriate time and place.

Material management has the responsibility for purchasing, procuring, storing, distributing, and disposing of the material needed and used by the facility.<sup>3</sup> Stores management is a vital part of the material management system. Its primary purposes are to provide services to the using activities and to provide for the efficient storing, handling, and redistributing goods to the user.<sup>4</sup>

The stores' function is comprised of the following activities: receiving, identifying, sorting, storing, order picking, distributing, and record keeping. The general objectives of the storage function

are maximum use of space, effective utilization of men and equipment, ready access to all items, efficient movement of goods, maximum protection of items, and good housekeeping.<sup>5</sup>

Storeroom design and location also are integral parts of efficient and effective operations. There should be off-street unloading facilities and receiving area. The literature sets a minimum of twenty square feet of storage space per inpatient bed and an additional storage area for outpatient facilities of 5 per cent of the total outpatient area. Storage for outpatient facilities can either be a part of the general stores' or located in the outpatient department.<sup>6</sup> There should be sufficient space for items to be stocked based on their need and usage. The floors should be smooth and able to withstand heavy traffic. The walls should be smooth and straight. For efficient operations all storage should be in one area with adequate lighting and temperature control. Fire protection and security should be required. Storeroom layout should provide easy accessibility to material and a minimum handling of goods.<sup>7</sup>

Some authors list the distribution of supplies as part of storeroom operations while others treat it as a separate activity. At Baylor University Medical Center, it is considered to be a stores' function. Numerous articles have been written about the pros and cons of the different material distribution systems ranging from fully automatic systems to totally manual operations. The general consensus as to what type of distribution system or combination of systems is to

be used depends on the hospital's capabilities, configuration, present and future requirements, and financial situation.

Whether a new facility is being planned or an existing one is being rehabilitated, there are many factors that will influence the type of system to be used. A feasibility study should be conducted to evaluate all pertinent factors. Some considerations are the cost of the equipment, operating costs, labor costs, maintenance, replacement, damage to material and supplies, and repairs to the equipment.<sup>8</sup> Installation costs are another vital element of the study.

While there is a wealth of information pertaining to storeroom activities and material distribution systems, there is little written about standards and criteria against which to measure performance or to establish staffing needs. The reason for this is the large number of different facilities and the diversity of activities that exist from one hospital to the next. The literature states that organizational and managerial principles could be used to establish goals, objectives, and standards. Storeroom operations should be examined with regard to these predetermined goals and objectives and staffed to meet the requirements.

The primary factor that must be remembered when evaluating storeroom operations is that the basic functions to be performed must be adopted and modified, when needed, to meet and satisfy the goals and objectives of the facility in which the storeroom will operate.

Footnotes

<sup>1</sup>John R. Willis, "Storeroom Design and Location," Hospitals, J.A.H.A., XLII (September 16, 1968), 89.

<sup>2</sup>This information was obtained from a Baylor University Medical Center report, circulated October 17, 1974, within the Center, which also compiled data from the AHA Guide to the Health Care Field, 1974.

<sup>3</sup>James P. Swindler, "Defining Materials Management," in Readings in Materials Management (Chicago: American Hospital Association, 1973), p. 17.

<sup>4</sup>George W. Aljian, Purchasing Handbook (3rd. ed.; New York: McGraw-Hill Book Company, 1973), p. 14-2.

<sup>5</sup>James M. Apple, Materials Handling Systems Design (New York: The Ronald Press Company, 1972), pp. 471-94.

<sup>6</sup>U.S. Department of Health, Education, and Welfare, Minimum Requirements of Construction and Equipment for Hospital and Medical Facilities (Washington, D.C.: Government Printing Office, 1974), p. 19.

<sup>7</sup>Willis, pp. 89-95.

<sup>8</sup>Gerald Oudens, "An Architect's View: Centralized Distribution System A Must," Hospitals, J.A.H.A., XLIII (February 1, 1969), 47-52.

## CHAPTER II

### DISCUSSION

#### Organization

The general and dietary storerooms were part of the Material Services Division and under the direct responsibility of the purchasing director. The storerooms were 475 feet apart and not readily accessible to each other. This physical separation resulted in each storeroom operating as an independent activity. All nonperishable dietary products were received and issued through the dietary storeroom. All other items except perishable foods (received directly by the kitchens) and pharmaceuticals (received and stored by the pharmacy) were received and issued through the general storeroom.

There were eight employees in the storerooms: the storeroom manager, who worked in the general storeroom; an assistant manager; a receiving clerk; a dietary storeroom clerk; and four delivery clerks. The general storeroom had seven employees while the dietary storeroom was a one-man operation.

There were no written policies or procedures for storeroom operations and no goals or objectives set forth. Job descriptions were written for all positions except the dietary storeroom clerk and the delivery clerks, who performed more than 50 per cent of the workload.

### User Satisfaction

Personnel from about 16 per cent of the using activities were interviewed to determine the effectiveness of storeroom operations. Each individual was asked the same series of questions. A copy of the questions asked is in Appendix B. Personnel responsible for material and supplies in these activity centers were interviewed. The centers selected were considered to be representative. They included patient floors in each hospital, laboratories, radiology, surgery, intensive care units, emergency departments, dietary departments, and administrative support activities.

The interviews revealed satisfaction with the support and responsiveness of the supply system. However, two complaints showed up in virtually every interview. They were the number of special orders that had to be made for recurring type items and the lack of a back-order system for stocked items. Most of the interviewees were quick to point out that they felt there was inadequate storeroom space to stock all of the needed items and that this was the reason they had to make so many special orders. The absence of a back-order system meant more work for them. Frequently they had to reorder items not available until the material arrived. The using activities were maintaining a one-week level within their units for the majority of stocked items.

The findings of these interviews were discussed with the purchasing director and the storeroom manager. The director of material services was also informed of the users' feelings about the supply system.

Space

One problem that continually came to the forefront during the evaluation of storeroom operations was the inadequate amount of storage space available. The problem of space affected virtually every function performed in the general and dietary storerooms and also affected the purchasing department and using activities workload. Trying to do an efficient job with limited storage area is very difficult.<sup>1</sup>

The literature states, as do the Hill-Burton construction guidelines, that minimum storage space should be twenty square feet per bed plus 5 per cent of outpatient departments square footage.<sup>2</sup> At Baylor the general storeroom had 7,427 square feet and the dietary storeroom had 1,880 square feet for a total of 9,307 square feet. This is well below the recommended minimum for an institution of this size. Based on the existing number of beds alone, Baylor should have at least 22,500 square feet of storage space.

The shortage of space caused an increased workload throughout the Center. The purchasing department had to process extra orders for the special and stock items. The Center was not able to reap the advantages of economic order quantities because the stocked items could not be maintained in the quantities needed due to the lack of space.

All orders, whether special orders or orders for stock listed items, were received and delivered by storeroom personnel. Due to the

large amount of special orders that were received daily and the frequency with which stock items had to be ordered and received, most of the time was spent in the receiving, storing, and delivering of special order functions.

Inadequate space made it difficult to achieve optimal layout for movement through the storerooms to fill orders, stock items, and receive items. Linens, certain forms, and other bulky items had to be stored in areas physically separated from the storerooms. Although minimal storage space of twenty square feet per bed has been recommended, some authors believe that thirty square feet per bed is more adequate. One of the primary reasons for a larger area is to permit the decision to stock an item to be based on the necessity of having the item available and not on the availability of storeroom space.<sup>3</sup>

Storage of some materials in scattered areas throughout the Center appears to be a simple solution to the problem. This would increase the total amount of storage space, but it would also greatly increase the workload and create additional problems. The idea of supplies and materials stored in various physically separated areas is frowned upon by materials management experts. This could be a temporary method of storing additional items that were needed, but it was not considered a viable solution. The resulting loss of effectiveness and efficiency would be greater than the benefits realized.

Expansion of the existing storerooms was considered, but this alternative was not feasible because of the locations of the storerooms and the facilities that encompassed them. To expand either of

the storerooms would have involved major renovation of the areas concerned and required relocation of the surrounding offices and departments. Since there were no areas large enough to accommodate relocation of the storerooms, this change could not be considered without planning for major renovation or construction.

One possible solution was to include a large storeroom area in the construction plans of the Heart Research and Treatment Center. The problem with this would be the distance required to make daily deliveries and the physical separation between the storeroom and the rest of material services. While current practice is to locate storage areas in the basement level of medical treatment facilities, many authors believe these areas could be better used for patient care. Another disadvantage of planning for basement storage area in the new building is the cost of construction. It would be less costly to build an off-site warehouse since a structure specifically designed for materials storage would cost less per square foot than the average cost per square foot for basement storage space.<sup>4</sup> Numerous hospitals have found relief to the space shortage by using off-site warehousing; they claim to have gained monetary savings as well as more space. Hospitals in large urban settings, especially those with multiple unit facilities, have developed or are developing this concept of off-site warehousing.<sup>5</sup> If properly designed and constructed the building could be lighted, heated, cooled, and maintained at minimal cost. The interior design should be simple with the emphasis on cubic storage.<sup>6</sup> There should also be a large, covered loading dock that is accessible

from the street, but located far enough off the street so that trucks can be parked for unloading without blocking traffic. The receiving office should be located adjacent to the dock and inside the building. The warehouse floor should be on the same level as the dock, if possible, to eliminate the need of an elevator. The building should be built according to the guidelines put forth in the literature for the construction of a warehouse, with modifications to meet the needs of the institution.

While most of the literature concerning off-site warehousing includes automated materials distribution systems, this concept did not appear to be feasible at Baylor University Medical Center. The physical configuration of the Center precluded total automated distribution.

There are two ways in which the building could be used. The first would be to use it strictly as a warehouse and keep the storerooms where they are. The second way would be to move all material services operations and offices to the warehouse.

Under the first plan, all bulk items and case lots would be removed from the storerooms and maintained in the warehouse. The storerooms would maintain a seven- to ten-day level of supplies and materials needed for the Center. The levels would be based on the consumption history of each item. Once a week the necessary items would be transferred from the warehouse to the storerooms to maintain desired levels of stocks. Approximately the same items in the same quantities would be needed each week, since demand should not

fluctuate significantly from one week to the next. The storage locations in the storerooms could be set up in stock number sequence. Then, all that would have to be done would be to place the items in their proper location when they are received from the warehouse, since the items would have already been marked with the stock number when they were received in the warehouse. The movement of all bulk items and case lots to the warehouse would create enough space in the storerooms to store a ten-day level of all needed supplies. The warehouse could use compartmentalized carts to load the necessary supplies and the carts could be transported via a panel truck. The warehouse staff could be filling the carts during the week and could call the storeroom before delivery to find out if any additional items were required. Deliveries from the warehouse to the storerooms would be made on those days when workload is lightest so that a maximum of personnel could be used to put the stock away.

All supplies and materials, except perishable foodstuffs and pharmaceuticals, would be delivered to and received by the warehouse. Once an item was received by the warehouse, it would be placed on the inventory and would not be dropped until it was issued by the storeroom. The driver used by the Center to run errands could pick up completed receiving reports from the warehouse, deliver pending receiving reports, and pick up any items needed in an emergency.

Requisitions would be filled and delivered by the storeroom personnel. The only change experienced by the rest of the facility would be the decrease in the number of special orders made.

Initially, it would take two employees to work in the warehouse, five in the general storeroom, and one in the dietary storeroom. One of the five general storeroom employees would still assist the dietary storeroom clerk on a daily basis. The number of employees required to staff this system would be one less than is needed for the existing system. Another benefit would be that the storeroom manager, counted as one of the five general storeroom employees, would have the time to supervise all operations, something he cannot do in the existing system.

Once the system was fully operational the number of warehouse personnel could probably be reduced to one employee. Deliveries per week would be minimal. When a large order was delivered the clerk could sign for the items and then call the storeroom manager. The manager could dispatch one of the other employees to the warehouse to assist in putting the items in stock. Personnel in the storeroom could be rotated for this function or to staff the warehouse.

The second way the warehouse could be used would be to move all material services activities there. The building could be adapted to provide offices for purchasing, storing, and other materials management activities. The print shop could be moved there also. The ground space needed for such a structure is much less than expected.

Although it may appear that such a building would require an enormous amount of ground space, the actual space requirements could be minimized by designing vertical cubic storage facilities. Office space could be suspended from an inside wall to encircle the warehouse area and provide a clear view of the core of operations.<sup>7</sup>

This approach would increase the storage space in the present building, free basement space to be used as patient care areas, and allow expansion of the emergency department.

A cart exchange system could be implemented to move supplies and materials from the warehouse to the using activities. This would entail the purchase of a truck by which the carts would be transported from the warehouse to the Center.

Carts could be filled and stored in the warehouse. Each day those carts which are to be exchanged could be loaded on the truck and brought to the Center. The carts could then be delivered to the using activities. Supplies for administrative areas or activities that do not require a cart exchange could be loaded on and distributed from one cart. Depleted carts could be transported by the same truck to the warehouse for replenishment. This system could entail a significant change in the way items were carried in inventory and the way they were expensed to using activities.

The greatest drawback to this alternative would be the dependence on a large van to carry the carts. Should the van break down or become inoperative there would be a major problem in getting supplies to the Center.

If an off-site warehouse is constructed as close to the Center as possible, with at least the recommended minimum storage space, a variety of methods and systems could be adopted. For example, another possibility would be to use a combination of the two methods described. This would leave the storerooms and other materials service activities,

except the print shop, where they are. The system would work as described in the first method and the area vacated by the print shop could be used for some other activity.

Regardless of the system used many benefits would be realized by construction of an off-site warehouse. The increased storage space would dramatically reduce the number of daily deliveries received by the Center. The number of purchase orders completed by the purchasing department would also be reduced. The need for daily delivery of special orders to the using activities would be virtually eliminated, since the number of special orders needed would be decreased. Items that had to be specially ordered could, upon receipt, be held until the next scheduled delivery to the using activity as long as the items were nonemergency.

The implementation of this concept would decrease storeroom workload by approximately twenty hours per day, reduce workload in the purchasing department (staff in this department could eventually be reduced also as the number of purchase orders and invoices processed would be reduced), and reduce the time spent by using activities in ordering supplies by alleviating the need for special orders. Also eliminated would be the congested area around the existing loading dock and the frequent daily traffic of delivery men through the main kitchen.

#### Supply Catalogs

As prescribed in the literature, Baylor University Medical Center had supply catalogs for the items carried in inventory. The

catalogs reflected stock number of each item, storage location, standard price, unit of issue, and a brief description of the item. The problem was that the catalogs were not current, did not accurately reflect prices and units of issue, and did not indicate which items had been deleted or added. This problem was discussed with the purchasing director and additional information was obtained.

The items normally kept in inventory were common usage items, that is, items used by most of the activities in the Center. Therefore, the majority of the items stocked were for patient care areas, offices, and other necessary activities. An effort was made to delete items which had not been issued in the previous six months so that this space could be better utilized. It was hoped that new catalogs would be assembled before the end of the year.<sup>8</sup>

A problem existed in determining which items should be stocked. As special order items were not given a stock number, the only way to gather consumption history was to rely on the buyer's memory or to screen processed purchase orders. An attempt was made to consolidate special orders for like items which could be listed on a single purchase order.

#### Inventory

The inventory system used was perpetual and automated. Requisitions and receiving documents were taken daily to the Center's data processing section. These source documents were then keypunched onto cards and batch-processed that evening to update inventory records.

Stock status reports were printed daily and items that required a buyer's attention were flagged.

Three inventory classifications were used. Code 1 was general storeroom items. Code 2 was dietary items maintained in the dietary storeroom. Code 3 was the forms used within the Center that were stocked in the general storeroom.

There were preprinted requisition forms for the various using activities for each class of items. Blank requisition forms were used to order special items (Appendix C).

Based on the Item Master Listing, November 19, 1974, there were 1,007 line items in Code 1; 349 line items in Code 2; and 535 line items in Code 3. Total line items stocked by the two storerooms was 1,891. Annual inventories were accomplished.

To verify the accuracy of inventory records at the Center, generally accepted statistical methods were used to determine and obtain necessary random samples. A 95 per cent confidence level with a 10 per cent margin of error was deemed desirable to validate the inventory records. Through the use of previous inventory records and statistical formulas it was found that a sample of 90 items from Code 1 and 70 items from Code 2 had to be verified in order to achieve the desired confidence level. Items to be physically counted and quantities compared to inventory listings were randomly selected and a physical inventory of these items was conducted. Based on the results of the samples taken it was found that Code 1 items were 49.4 per cent accurate and Code 2 items were 35.7 per cent accurate. There were no

criteria or standards for evaluating these findings; however, the military medical material service looks for 95 per cent accuracy. When the quantity counted was compared to the quantity reflected on the inventory listing it was found that there were items with quantities above those reflected as well as some below.

The inaccuracy of the inventory records could have been caused by such factors as wrong quantities issued, wrong items issued, key-punch errors, wrong receiving reports processed, wrong quantities checked in, and pilferage.

During the interviews with using activity personnel, it was noted that the individuals who checked the items against the requisition forms stated there were no problems with getting the wrong quantities or the wrong items. This contradicted the inventory results.

A back order system was not established for stock items. A "fill or kill" system was used; if the item was not in stock when ordered it was simply crossed off the requisition. If the using activity requisition had an item on it that was out of stock or not available in the quantity desired, a line was drawn through the item or the quantity ordered was changed to the quantity provided. It was the requestor's responsibility to notice that an item was crossed off and to reorder the item. The storeroom did not maintain records of these actions. This system caused the activity reports to always reflect a "fill rate" of 100 per cent, which was not the case.

There did not appear to be a consensus in the literature as to whether or not a back order system was required. A "fill or kill"

system made for more simplified storeroom operations and record keeping; however, it meant more work for using activities that must order supplies.

The situation was discussed with the purchasing director and the storeroom manager. Even though users complained of the lack of a back order system, the out-of-stock percentages indicated no significant work was being caused by the lack of such a system.

A back order system was in effect for special orders in that the requisition for an item from the using activity was attached to the pending receiving report. Once the item was received and processed, it was delivered to the using activity.

It did not appear that there were many out-of-stock situations for stocked items. For Code 1 items, the out-of-stock percentage, based on randomly selected stock status reports, was 2.99 per cent; for Code 2 items it was 2.01 per cent; and for Code 3 items it was .94 per cent. The standard used by the military is 5 per cent.

There were some items in the general storeroom called standing order items that were on a yearly contract basis. The storeroom manager was responsible for periodically reviewing and ordering these items. He noted the placement of the order and when it was received he completed a receiving report so that inventory update could be accomplished. The problem was the storage areas for these items were not marked to reflect reorder points. Since there was no accessible listing of standing items, only the storeroom manager knew which items and what quantities were needed.

### Storeroom Layout and Design

The proper storeroom design attempts to achieve specific objectives. There should be a straight line flow of activity through the storeroom with as little backtracking as possible. The handling and transporting of materials should require minimum motion and travel. There should be efficient use of space and provisions should be made for flexibility and expansion.<sup>9</sup> Efficient storeroom operation depends primarily upon two factors. The first is the movement of materials into and out of storage in the shortest possible time using the minimum amount of labor. The second is the proper storage of the material while in the storeroom.<sup>10</sup>

Storage areas should be marked to reflect storage location number, stock number of the item, the unit of issue, and the item description. Goods should be marked with storage location numbers and stock numbers.

The marking of bins, shelves, bulk storage areas, and the items with this information, and breaking the cases down to the unit of issue would reduce the number of inventory discrepancies. It could also reduce the time spent in filling orders. It is important, for effective inventory control, that each item be marked as it is placed in storage.<sup>11</sup>

The physical layout of both storerooms with regard to where and how the items were stored was examined. A review of the stock status reports was made. Those supplies issued and received with the most frequency, top 10 per cent, were selected for specific examination

as to location and accessibility. It was found that these items were stored in locations near the exit and required minimum handling and movement.

The dietary storeroom layout, aside from lack of space, was well arranged. Orders were filled with minimum movement. While the storage areas were marked with location numbers, the items were not marked with stock numbers or storage locations. Due to lack of space, the foodstuffs were stored close together and at times overlapped storage area markings. This made it difficult to know which item was to be pulled without looking at the item description on the requisition. Carts could be moved up and down the aisles in the storeroom. The vast majority of items were stored on the floor or pallets. Shelves were not used. A cabinet was used for storage of small items, such as spices and food coloring, but these items were difficult to find. Neither the cabinet nor the items were marked to show locations or stock numbers. Supplies that were issued as "each" were not taken from their cases until needed to fill an order. While the dietary storeroom clerk knew the location of specific items, it would be extremely difficult for anyone else to issue or receive stock.

In the general storeroom, supplies were also well arranged, but shelving, by necessity, had been placed close together and the carts could not fit between shelves. Therefore items to be picked or placed in storage had to be carried to and from the shelves or transferred by a shopping cart, necessitating more trips. Bulk items were stored in areas where delivery carts could be used.

Bins, shelves, and bulk storage areas were marked with storage location numbers and the majority of items were labeled accordingly. However, neither the storage locations nor the items were marked with the stock number.

Requisitions and inventory listings were accomplished through the use of stock numbers (requisitions reflected storage location also, but the stock number was the first column listed). They were in effect running a dual system; buyers, users, and inventory clerks were working by stock numbers while the storerooms used storage location numbers.

Both storerooms were air-conditioned for temperature control and had sprinkler systems for fire protection. There were no windows in either location; however, the lighting was adequate. There were special areas for the storage of cylinder gases and combustible products. These areas were in separate rooms and were vented.

The storerooms were secured areas and protection of goods from pilferage and deterioration appeared adequate. The dietary storeroom had only one doorway leading to it while the general storeroom had two, one in front that led to the hallway and one in the rear to receive deliveries. These doors were locked and the limited keys were controlled.

The storerooms were located in the basement while the loading docks were on the first floor. There was one freight elevator leading from the dock to the general storeroom. Vendors brought their wares down the elevator into the storeroom and usually charged an "inside"

delivery fee. The loading dock was in a congested area. While the dock was located off the street, the truckers had to use the same driveway entrance that was used by obstetric patients as well as others. Only two trucks could park at the dock at any one time. With the number of daily deliveries received by the storeroom, there were often more than two trucks arriving at the same time. This blocked the driveway entrance and hampered patients trying to enter because they could not maneuver their vehicles around the trucks.

The loading dock for the dietary storeroom, located above the main kitchen, also had a freight elevator. Since this elevator opened into the kitchen, the vendors had to go through the kitchen to make deliveries.

Since the loading docks were not covered, the supplies and personnel were exposed to inclement weather. After heavy rains, water leaked into the general storeroom. The storing of stock in these areas of leakage was usually avoided.

#### Receiving Function

The receiving of goods is one of the primary functions of a storeroom.<sup>12</sup> A typical procedure consists of the following basic elements: unloading and checking the shipment; unpacking and inspecting the material (material received against the packing slips and the purchase order); verifying quantity received and viewing the general condition of the items; completing receiving reports and other necessary paperwork; and placing the merchandise in stock or delivering the items.<sup>13</sup>

Many deliveries were received on a daily basis due primarily to the shortage of storage space. The items were brought into the general storeroom via the loading dock entrance at the rear of the storeroom; however, the receiving office was located in the front of the storeroom. The driver would bring the goods into the rear of the storeroom, leave them there, and walk to the office to find someone to sign for them. The driver and clerk would then walk back to where the merchandise was, verify the invoice, and the driver would leave. As a result of this arrangement, the items were usually left where they were until they could be unpacked and inspected.

There was a receiving clerk position, but goods were received and processed by the storeroom manager, the assistant manager, or the receiving clerk. The receiving clerk was also used for many other duties within the storeroom and was the "back-up man" for the dietary storeroom. The receiving clerk was not being utilized in the capacity he was hired to perform.

Most of the items, except bulk goods, were brought to the office for unpacking and inspection. Special orders were placed on a delivery cart for distribution by the delivery clerk. Stock items were placed in another area.

The paperwork associated with receiving was minimal and the flow was simple. The receiving reports were filed and maintained in the storeroom office. The last copy of the purchase order was used as the receiving report and was so marked (Appendix D). Once the buyer had completed a purchase order, the receiving copy along with the

requisition, if it was for a special order, was brought to the storeroom where it was filed by storeroom personnel. When the goods arrived, the receiving report copy was pulled from the file, annotated, and placed in the "out" box. This box was emptied each day and the completed reports served as source documents for updating the computer records. Purchasing department personnel who used the files and emptied the "out" box had to travel from the rear of the storeroom (where there is a connecting door between the purchasing department and the storeroom) to the office and back many times a day.

Another problem caused by the receiving office's location in the front of the storeroom was that there was no one in the rear of the storeroom to witness anyone entering or leaving the storeroom by the rear entrance.

While the receiving procedures were being accomplished effectively, these procedures in the general storeroom could be improved.

The receiving procedures could be accomplished more efficiently if a desk and work table, with the files, were set up in the rear of the storeroom. The receiving clerk could remain in this area and not be used, except for emergencies, for any other duties. This would reduce the number of times material was handled and the number of people involved and would provide someone to monitor arrivals and departures of drivers. This change would also reduce the distance traveled by purchasing department personnel who use the files daily.

These changes could be accomplished with some minor alterations

in the storeroom and without loss of time. The required alterations and changes were discussed with the storeroom manager.

#### Filling of Orders

There was a regular schedule for using activities to submit routine requisitions. They were sent, via pneumatic tubes or hand-carried, to the storeroom one to two days before scheduled delivery date. The requisitions were completed in three copies. Two copies went to the storeroom and one copy was maintained by the using activity. Since each of the three delivery clerks had specific areas of responsibility, the requisitions were sorted and placed in the appropriate delivery clerk's "in" box. The requisitions were then used to fill the order. When the using activity received its order the supplies were checked and the requisitions signed. The signed requisitions were brought back to the storeroom and placed in the "out" box. Picked up daily, these requisitions were used as source documents for updating the inventory and for charging items to the cost centers. After this they were filed.

Requisitions received for special orders were brought to the purchasing department, and when the purchase order had been completed, it was attached to the receiving report copy. When the item arrived, the requisition was detached from the receiving report and processed in the same manner as routine requisitions.

No difficulties with this system were apparent and orders were filled effectively and efficiently.

### Materials Distribution

A totally manual system of distribution of materials and supplies was used by all storerooms except the dietary storeroom, which used one motorized cart for deliveries.

A great deal of time was spent in the delivery of goods from the storerooms to the using activities. Much of this time was consumed in pushing the carts to their destinations, waiting for elevators, and waiting for someone to check in the items.

A cart exchange system could reduce the time spent in the delivery of supplies, but this system requires a large cart storage area. A cart exchange system, as described in the literature, did not appear to be acceptable at this facility. The space needed to store the carts, both on the units and in the storeroom, was not available.

An automated materials distribution system likewise could reduce the time consumed in the delivery of materials and supplies but it too was precluded by the Center's physical configuration and lack of space.

Manual distribution systems can be cumbersome, slow, noisy, dangerous, and in view of rising labor costs, expensive.<sup>14</sup> While it does not sound like an ideal method based on today's technology in automated distribution systems, there are cases where manual transportation is the most logical answer.<sup>15</sup> This was the case at Baylor University Medical Center.

The Center has a pneumatic tube system, but it was not capable of handling storeroom supplies and materials. The system could be

used to transport certain small special orders or items needed in an emergency. However, the feasibility of using this system, and the matter of obtaining signatures for these items, were not examined during this study. The possibility of using the pneumatic tube system for this purpose was brought to the attention of the storeroom manager. A system that should be considered is the combining of central sterile services and the general storeroom. All supplies and material could then be delivered at one time through one system. The existing space problem did not allow for this at the time of this study.

### Workload Statistics

#### General Storeroom

The general storeroom's workday was reviewed to determine if there was adequate staffing to perform the necessary tasks. Table 1 shows the total daily workload, the events that make up the workload, and the time spent to perform these tasks.

The computation of the daily frequency of the first ten listed events was from historical data and a daily work log that was maintained by the writer during the two-week on-site study. The remainder of the daily frequency of events was obtained from the work logs and discussions with the storeroom manager and employees. All figures were based on the existing workload.

The average time per event was computed by finding a mean time for each event based on actual timing of the event at randomly selected occurrences. The mean times were discussed with the storeroom manager and they were considered to be representative. The

TABLE 1  
GENERAL STOREROOM DAILY WORKLOAD

Event	Average Time Per Event (in min.)	Daily Frequency of Event	Daily total Time (in min.)
1. Item returned to vendor . . . . .	15.00	3.00	45.00
2. Item shipped for repair . . . . .	18.00	2.00	36.00
3. Sign for vendor deliveries . . . . .	0.50	23.00	11.50
4. Receipt of stock items (line items) <sup>a</sup> . . . . .	2.50	39.50	98.75
5. Place item in stock (line items) <sup>a</sup> . . . . .	3.00	39.50	118.50
6. Receipt of special orders (purchase orders) <sup>b</sup> . . . . .	4.50	58.62	263.79
7. Filing of pending receipts <sup>c</sup> . . . . .	0.50	72.75	36.38
8. Scheduled breaks . . . . .	15.00	7.00	105.00
9. Walk-in requests . . . . .	4.50	14.00	63.00
10. Filling of orders . . . . .	36.21	22.20	803.86
11. Delivery of stock items (trips made) <sup>d</sup> . . . . .	22.61	23.60	533.60
12. Delivery of special orders (trips made) <sup>d</sup> . . . . .	39.80	15.00	597.30
13. Clean storeroom . . . . .	40.00	1.00	40.00
14. Pick up mail . . . . .	3.00	1.00	3.00
15. Interruptions <sup>e</sup> . . . . .	2.24	70.00	156.80
16. Weekly events <sup>f</sup> . . . . .	. . . .	. . . .	342.00
Total . . . . .			3254.74
Daily Workload . . . . .			54.25 hrs.

There are other duties that must be performed in the storeroom, however, they occur on a less than weekly basis and are not included in daily workload figures.

<sup>a</sup>Reflects number of different items, not quantity of each item.

<sup>b</sup>Reflects number of purchase orders only, does not include number of line items or quantity of each received.

<sup>c</sup>There is an average of 58.62 special purchase orders and an average 14.13 stock item purchase orders made per day. All purchases are received through the general storeroom. These figures do not include purchase orders for dietary products.

<sup>d</sup>A trip is the time it takes a delivery clerk to make a delivery and return to the storeroom.

<sup>e</sup>This includes telephone calls, inventory checks, answering buyers' questions, etc.

<sup>f</sup>These are duties that are done each week, but not on a daily basis. It includes restocking of bins; diluting solutions and filling bottles; drawing alcohol; receiving, storing, and processing of forms (they stock 349 different forms); and filling and delivering orders to School of Nursing, Student Religious Activities, Surgical Research Building, and the Medical Library. It takes approximately 28.5 hours to accomplish these tasks and a daily average of 5.7 hours.

administration was informed that these times should not be used as standards, but were to provide information concerning average workload.

The general storeroom in 1973 filled 34,487 requisitions; 17,588 of these were for stocked items and the remainder were for special orders. In 1974, total requisitions filled increased by 5.5 per cent to 36,384; however, the number of requisitions filled for stocked items decreased to 17,464. Special order requisitions rose from 16,899 to 18,920, an increase of 11.96 per cent. This increase was caused by the lack of storage space. Many of these special order items were ordered on a monthly basis and should have become a part of standard stock; however, they could not do so due to the lack of storage space.

In 1974, the storeroom received and processed 14,809 special orders and 3,404 stock orders; 9,627 line (different) items were on these stock orders. Based on the number of workdays, the storeroom received an average of 58.62 special purchase orders, 14.13 stock orders, and 39.5 line items each day.

Discussion with the storeroom manager revealed that about 70 to 75 per cent of the work consisted of picking or filling orders, delivery of routine orders, and delivery of special orders.<sup>16</sup> Emphasis was placed on these three events. The methods used to derive the workload figures will be discussed.

#### Filling of Orders

There were 111 cost centers that sent orders to the storeroom each week. Assuming that the orders were received each day of the

five-day work-week, the storeroom personnel averaged filling 22.2 orders per day. These orders were usually comprised of more than one requisition, since many cost centers were made up of more than one using activity; however, they were filled at the same time based on their location. This reduced the number of deliveries made to the same area.

It was felt that 90 per cent certainty with a 10 per cent margin of error would be satisfactory for estimating the average time required to fill an order. A minimum sample size of 62 was needed and obtained to satisfy this criterion.

Three employees in the storeroom routinely filled and delivered orders. They were timed while filling orders, at various times, during the two-week study.

With a sample size of 62, the mean time to fill an order was 36.21 minutes with a standard deviation of 17.36 minutes. Using a 90 per cent confidence interval for the mean, it was found that the average time for filling an order should fall between 32.72 minutes and 39.70 minutes.

Using the mean time of 36.21 minutes, it took an average 803.86 minutes per day to fill the average number of 22.2 orders per day. Thus, 90 per cent of the time, it took between 12.11 and 14.69 hours per day to fill orders; on the average, 13.4 hours.

#### Delivery of Stock Items (Trips Made)

Based on the number of delivery locations, the number of orders that could be taken at one time, and the average size of the orders, it was computed that there were 23.6 trips made per day.

The deliveries were made to seven different areas: Truett Hospital; Hoblitzelle Hospital; Jonsson Hospital; Veal Hospital; Collins Hospital; the Medical Plaza; and the basement area. Since different routes were used, stratified random sampling techniques were used to derive the mean delivery time.

The mean delivery time to each location, the standard deviation, and the percentage of daily deliveries were calculated by taking sample sizes of ten to twenty deliveries to each location. These results are recorded in Table 2.

TABLE 2  
DELIVERY TIMES TO EACH LOCATION  
FROM GENERAL STOREROOM

Location	Mean <sup>a</sup> Time	Standard <sup>a</sup> Deviation	Percentage of Daily Deliveries
Truett	20.4	7.47	36%
Hoblitzelle	24.5	7.08	16
Jonsson	16.6	5.28	18
Veal	27.6	5.63	10
Collins	29.1	5.78	8
Medical Plaza	32.1	6.27	3
Basement Area <sup>b</sup>	25.6	9.93	9
All locations	22.61	13.47	100%

<sup>a</sup>Reflected in minutes.

<sup>b</sup>Basement area is comprised of all interlinked hospitals.

The mean delivery time to all locations was 22.61 minutes with a standard deviation of 13.47 minutes. Using a 90 per cent confidence interval, it was found that the mean time to make a trip should fall

between 18.23 and 26.99 minutes. The average time of 22.61 minutes per trip accounted for 8.89 hours of work per day.

#### Delivery of Special Orders (Trips Made)

Based on the work logs kept and discussions with personnel, it was determined that an average of fifteen trips were made per day to deliver special orders. The storeroom received 58.62 special purchase orders per day with varying amounts of line items per purchase order. The orders were checked in and placed on a delivery cart. When the clerk who delivered specials returned from one trip, he would take the next loaded cart and continue the deliveries.

A sample size of 39 randomly selected special deliveries were timed, which was large enough to satisfy the minimum 90 per cent certainty and 10 per cent error margin that was desired. The mean time of the samples was 39.80 minutes with a standard deviation of 15 minutes. Again using a 90 per cent confidence interval for the mean, it was determined that the average time per special delivery trip would fall between 35.98 and 43.66 minutes. The average special delivery time of 39.80 minutes accounted for 9.96 hours of work per day.

After computation of the workload statistics it was found that filling of orders, delivering orders, and delivering special orders, on the average, accounted for 59.44 per cent of the workload; 32.25 hours. Total time to accomplish the daily work was 54.25 hours in the general storeroom.

Dietary Storeroom

The dietary storeroom was moved in the organizational structure from the Food Service Department to the Material Services Division in July 1974.

While the workload did not significantly change for the dietary storeroom clerk, the circumstances under which he operated changed dramatically. Prior to the organizational move, virtually all main kitchen personnel had access to the storeroom. Delivery of items to the main kitchen was minimal, since personnel could go to the storeroom and obtain the items whenever desired. Also, when the storeroom clerk was making a delivery to one of the other dietary departments, main kitchen personnel would accept delivery of items from vendors. Documentation and record keeping were minimal in the storeroom.<sup>17</sup>

From July 1974 to February 1975, there were 1,113 purchase orders for stocked dietary items. From July to December 1974, the dietary storeroom received 3,667 line items and issued 18,107 line items. Since the transfer, the storeroom area has become secured and the storeroom clerk must deliver all items to the main kitchen as well as the other using activity. The storeroom clerk was the only person who could sign and receive items from vendors. Therefore, when he was making a delivery and a vendor arrived, the vendor had to wait until the storeroom clerk returned before the items could be signed for and received. The storeroom clerk was responsible for proper documentation on all requisitions and receiving reports to ensure proper charging of items to cost centers and inventory updates on a daily basis.

Data were maintained to reflect workload in the dietary storeroom; however, data were not kept before the move and thus there was only an eight-month historical base from which to compute workload factors.

There were ten using activities that ordered dietary products from the storeroom on a weekly basis, with some ordering daily and others ordering once or twice a week. Under the existing system seventeen orders were filled per week. Of these, seven were picked up from the storeroom and required no delivery; the remaining ten orders were delivered and averaged nineteen trips per week.

Table 3 reflects the weekly events, the frequency with which they occurred, and the time each took to accomplish.

Vendor deliveries were made daily, an average of 48 per week, and approximately 80 per cent of these arrived before noon. The items were brought directly to the dietary storeroom by the vendors. There was a fairly steep incline (about 10 degrees) leading up to the dietary storeroom and the storeroom clerk had to help the vendors push their loaded carts up this ramp. Normally, the items were checked in by the dietary storeroom clerk, unloaded from the carts by the storeroom clerk and driver, and then placed in stock by the clerk. One vendor, the largest supplier of foodstuffs, delivered three times each week and the driver assisted the storeroom clerk in putting the items in stock. Since delivery from this vendor always involved more than one trip to bring in the entire order, the clerk had to stop whatever he was doing and place the delivered items into stock at that moment. The average time to check in these items and place them in stock was

TABLE 3

## DIETARY STOREROOM WEEKLY WORKLOAD

Event	*Time Per Event	Frequency of Event
Main Kitchen Order	75	Daily <sup>b</sup>
Deliver Main Kitchen	45	Daily <sup>c</sup>
Jonsson Kitchen Order	45	Tues, Fri
Deliver Jonsson	20	Tues (2)
Doctors Cafe	25 <sup>a</sup>	Wed
Hoblitzelle Kitchen Order	45	Mon, Fri
Deliver Hoblitzelle	25	Mon (2), Fri
Truett Kitchens' Orders	125 <sup>a</sup>	Thurs <sup>d</sup>
Isolation Orders	35	Fri
Deliver Isolation	45	Fri
Receipt of Goods	1.5	Daily (9)
Place Items in Stock	5	Per Delivery
Receipt and Storage (Main Vendor)	35	Tues, Wed, Thur
Miscellaneous <sup>e</sup>	90	Daily

\*Reflected in minutes.

<sup>a</sup>Includes time of person picking up orders and verifying quantities.

<sup>b</sup>Two orders on Monday and double order on Friday.

<sup>c</sup>Monday--3 trips; Friday--4 trips; other days--2 trips.

<sup>d</sup>There are 5 separate kitchens in Truett and each one orders on Thursday.

<sup>e</sup>Includes scheduled breaks, interruptions, telephone calls, walk-ins, etc.

thirty-five minutes. One of these deliveries, usually made on Wednesday, was a double load and took about an hour to complete.

Orders for isolation patients were filled at least once a week, however, this could occur more frequently if needed. The items needed to fill an isolation order were not kept in the dietary storeroom, due to lack of space, and the clerk had to leave and lock the storeroom to fill these orders. It took an average of thirty-five minutes to fill an isolation order due to the separate location.

Two delivery carts, one motorized, were used in the dietary storeroom. Neither cart had brakes, thus when a cart was loaded the storeroom clerk had to find someone to aid him in taking the cart down the incline. The storeroom was located in an "alleyway" off the corridor in the basement. The incline leading to the storeroom had walls on both sides which prevented the clerk from seeing if anyone or anything was coming past the "alleyway." Approximately eight feet from the "alleyway" and directly in front of it was a wall. The carts could not be pushed down the incline, therefore the clerk had to back down the ramp, holding the cart in front of him. It would have been very easy for the clerk to lose control or slip and be pinned to the wall by the loaded cart. This was an extremely dangerous situation.

The computations of average times for the various activities in the dietary storeroom were not as involved as those for the main storeroom. There were only ten using activities and they placed virtually the same order each week. Delivery times were also much less difficult to compute since deliveries were made to only seven locations

and all but one of these were in the basement. Samples were obtained in order to arrive at a mean delivery time. The only time that fluctuated significantly was that for deliveries to the main kitchen. The time involved was a function of how much and how soon someone in the kitchen would assist the storeroom clerk in unloading the items and putting them in the proper location. The mean time of these deliveries was 45 minutes with a standard deviation of 14.4 minutes from a random sample of 10 trips. The dietary storeroom clerk was responsible for "assisting" in putting the items delivered to the main kitchen in the various storage locations within the kitchen. All of the average times used in the study, the frequency of the events, and the workload data were discussed with the storeroom manager and the dietary storeroom clerk to assure that no significant disparity existed. It was felt that the findings accurately reflected the work that was done.

Table 4 shows the activities that occurred, the time involved in completing them, and the total hours required to accomplish the necessary tasks for each workday. The number of hours needed to complete a day's work was found to differ from one weekday to the next. The weekly workload, unlike that of the general storeroom, could not be spread over the five-day workweek. Certain activities took place on certain days and could not be changed. As an example, on Friday the main kitchen ordered enough foodstuffs to last the entire weekend, and on Monday morning it had to immediately reorder items to prepare that day's menu. There was not sufficient storage space in the kitchen to house more items and reduce the number of orders.

TABLE 4

DIETARY STOREROOM WORKLOAD PER DAY OF WEEK  
(Minutes Spent In Activities)

	Orders	Trips	Receiv- ing	Stock- ing	Main Vendor	Misc.	Total Hrs.
Monday	195	195	13.5	45	..	90	8.98
Tuesday	120	130	13.5	45	35	90	7.23
Wednesday	100	90	13.5	45	60	90	6.64
Thursday	200	90	13.5	45	35	90	7.89
Friday	275	250	13.5	45	..	90	11.23

Workload Summary

There were 54.25 hours of work to be accomplished in an average day in the general storeroom and an average 8.39 hours per day in the dietary storeroom for a total of 62.64 hours per day. The dietary storeroom workload did not allow the tasks to be done each day; however, for computation the weekly workload was spread over a five-day period.

There were 62.64 hours of work per day and 64 man hours authorized for the storerooms. A review of work history disclosed that over the past 54 weeks 92 per cent of the hours authorized were actually worked. This took into account absenteeism, vacation time, sick days, and birthday holidays. With 92 per cent productive time there was a need for 68.09 man hours to accomplish the workload. Thus there was a daily shortage of 4.09 man hours.

This shortage was compensated for through the use of overtime. Over the last 24 weeks there was a total of 252 hours of paid overtime

and 131.4 hours, or 52 per cent of this, was overtime by the storeroom manager, the highest hourly wage earner in the storeroom. Since overtime was paid at time and a half and the highest wage earner was performing more than 50 per cent of the overtime, it was evident that the cost of this daily average of 2.1 hours of overtime could pay for approximately 4 hours of an additional worker.

An additional 4.09 hours per day were needed to accomplish the present workload. In addition, workload will increase this year with the opening of five operating rooms and a recovery room in the Collins Hospital in March and the opening of the Cancer Center, scheduled for September.

There was more to consider than just workload data. The figures did not reflect the type of work that was done. Even though personnel were present for work 92 per cent of the time, it was not realistic to assume they worked every minute. In the general storeroom the workers were constantly on their feet, having to move around the storeroom to do the various tasks or traveling fairly long distances, pushing heavy carts, to deliver orders. The work was fatiguing, and, in the dietary storeroom, extremely heavy.

As there was only one man in the dietary storeroom, every item of stock, whether issues or receipts, was handled by him. The majority of dietary items were canned goods, delivered by the case, and very heavy.

When the dietary storeroom clerk filled an order he had to lift heavy goods from stock and place them on the delivery cart.

After the cart was loaded it had to be taken down the ramp. The clerk often had to find someone to help him because the cart was too heavy for one man to control. Then, after going back up the ramp to lock the storeroom, he continued with the delivery. When the destination was reached he again lifted the heavy items and placed them in the kitchen storeroom, most of the time without help. He had to take the empty cartons out of the main kitchen storeroom, and rearrange the stock to put the items he delivered away.

Many of these problems would be alleviated by physically combining the two storerooms. This would decrease the total workload and make for smoother operations. The receiving function would not be "duplicated" and the one-man dietary storeroom operation would be eliminated. However, lack of space made this impossible.

These workload findings indicated that there were not enough man hours available to accomplish the required total workload in the manner prescribed in the literature. There were two possible solutions to the situation. One was to find different methods and decrease the workload; the other was to increase the staff.

The workload would be decreased if the number of vendor deliveries received daily were reduced. This would affect the time spent in the receiving function, the storing function, and the delivery of special orders, all of which were time-consuming. Vendors were requested to deliver their goods at certain times in an effort to spread the workload, but this had no effect on the total number of deliveries to the Center. One method of accomplishing this would be

for the purchasing department to combine orders, which would decrease the number of daily deliveries. Purchasing department operation was not studied to determine the feasibility of this alternative. It appeared on the surface that workload could not be substantially reduced by this method due to lack of storage space.

Daily workload would be reduced if orders were filled and delivered every two weeks on a staggered system rather than every week. This could reduce the number of orders filled and delivered each week by 50 per cent. It would necessitate using activities maintaining a two-week level of supplies in lieu of the one-week level that was maintained. Storage space, however, was inadequate to achieve this.

Another method to decrease workload would be to reduce or eliminate the deliveries of special orders. When special orders were received, the items could be held until the next routine delivery to the intended operational activity. Emergency items received via special orders would be delivered upon receipt. This would reduce workload by approximately eight hours each day. Once again the lack of space eliminated this as a feasible method; there was no area where these items could be held pending delivery.

There were various alternatives as to how the workload could be decreased; however, they were not under the control of the store-room manager nor did they appear to be feasible at that time.

The existing workload, the physical aspects of the job, the amount of productive time, and the forthcoming increased workload definitely showed the need for an additional worker. The daily

shortage of slightly more than four man hours could be eliminated by hiring an individual. In addition, when the increased workload becomes a reality the person will be fully trained and there would be no loss of effectiveness in storeroom operation. While the amount of time needed to accomplish the additional workload could not be accurately determined, the extra man hours provided by the added worker should be sufficient.

The new worker should be used in both storerooms. A proposed schedule, based on the workload statistics, would be to have the individual work in the dietary storeroom from 8:00 a.m. to 12:30 p.m. Monday through Thursday and all day on Friday. The remainder of the time should be spent in the general storeroom.

Training and utilization of the worker should be left to the discretion of the storeroom manager. More than likely, until the individual is trained, some of the work will take longer to accomplish and no appreciable change will be noticed. Once training is completed, many procedures that should have been done, but were put off, will be accomplished. Overtime should be eliminated and greater overall effectiveness and efficiency should result.

#### Summary of Chapter

The intent of this chapter was to present the findings of the two week on-site study in light of the objectives stated in Chapter I and to identify problem areas. Some methods to resolve these problems and the reasons they could not be implemented were also discussed.

One objective of this study was to see if there was "effective and efficient use of labor" to accomplish the functions of the storerooms. It is relatively easy to show whether or not methods are "effective." This is accomplished by examining the results and determining if the objectives were satisfied. With the exception of the inventory discrepancies, which should be evaluated in greater depth by the staff and corrective action taken, it was found that operations were effective.

There is a major problem when an attempt is made to evaluate efficiency. The evaluation of efficiency, in the majority of instances, is extremely subjective in nature. It can be said that efficiency is "in the eyes of the beholder."

While it cannot be stated categorically or proven statistically, some things were believed to be inefficient. Bins, shelves, and other storage places were not marked with adequate information. Goods that were placed in stock were not marked with stock numbers and, in the dietary storeroom, they were not even marked with storage location. Case lots were not broken down into their units of issue and some units of issue reflected in supply catalogs were considered questionable. The receiving function was performed inefficiently because of the method used and the place where it was done.

<sup>15</sup>Anton B. Hauser, "Materials Handling for Hospitals," *Progressive Architecture*, November, 1970, p. 113.

<sup>16</sup>Mr. Jordan Hixley, Storeroom Manager, private interview held during on-site study at Baylor University Medical Center, Dallas, Texas, March 3, 1975.

Footnotes

<sup>1</sup>John R. Willis, "Storeroom Design and Location," Hospitals, J.A.H.A., XLII (September 16, 1968), 89.

<sup>2</sup>U.S. Department of Health, Education, and Welfare, Minimum Requirements of Construction and Equipment for Hospitals and Medical Facilities (Washington, D.C.: Government Printing Office, 1974), p. 19.

<sup>3</sup>Willis, p. 89.

<sup>4</sup>Edward M. Boudreau, "Meeting the New Requirements for Hospital Materials Handling," Hospitals, J.A.H.A., XLIII (February 1, 1969), 43-4.

<sup>5</sup>Frederick L. Soule, "Hospital Materials Management," (unpublished masters thesis, Duke University, 1973), p. 8.

<sup>6</sup>Boudreau, p. 44.

<sup>7</sup>Ibid.

<sup>8</sup>Mrs. Martha Rusk, Purchasing Director, private interview held during on-site study at Baylor University Medical Center, Dallas, Texas, March 3, 1975.

<sup>9</sup>Lamar Lee, Jr. and Donald W. Dobler, Purchasing and Materials Management (2nd ed., New York: McGraw-Hill Book Company, 1971), pp. 408-10.

<sup>10</sup>George W. Aljian, Purchasing Handbook (3rd ed., New York: McGraw-Hill Book Company, 1973), p. 14-9.

<sup>11</sup>Willis, p. 93.

<sup>12</sup>James M. Apple, Materials Handling Systems Design (New York: The Ronald Press Company, 1972), p. 471.

<sup>13</sup>Lee and Dobler, pp. 393-94.

<sup>14</sup>George Spink, "A Survey of Automatic Materials Distribution Systems," Hospitals, J.A.H.A., XLIII (February 1, 1969), 53.

<sup>15</sup>Anton H. Maurer, "Materials Handling for Hospitals," Progressive Architecture, November, 1970, p. 113.

<sup>16</sup>Mr. Jordan Hinsley, Storeroom Manager, private interview held during on-site study at Baylor University Medical Center, Dallas, Texas, March 3, 1975.

17 Rusk interview.

## CHAPTER III

### CONCLUSIONS AND RECOMMENDATIONS

#### Conclusions

As a result of this study, the following conclusions have been made:

1. The amount of space available in Baylor University Medical Center for general and dietary storerooms is less than the recommended minimum.
2. The shortage of space for storeroom activities has increased the workloads of not only the storerooms and the purchasing department but also those of using activities throughout the Center.
3. The shortage of storeroom space and the physical configuration of the building housing the storerooms have combined to restrict the effective use of personnel and equipment, limit access to items, and create hazards for storeroom employees.
4. Although satisfied with the responsiveness of the Center supply system, the personnel in using activities blamed inadequate storage space for the many special orders they had to prepare.
5. Staffing was inadequate for efficient operation of the storerooms.

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4. Although satisfied with the responsiveness of the Center supply system, the personnel in using activities blamed inadequate storage space for the many special orders they had to prepare.
5. Staffing was inadequate for efficient operation of the storerooms.

Recommendations

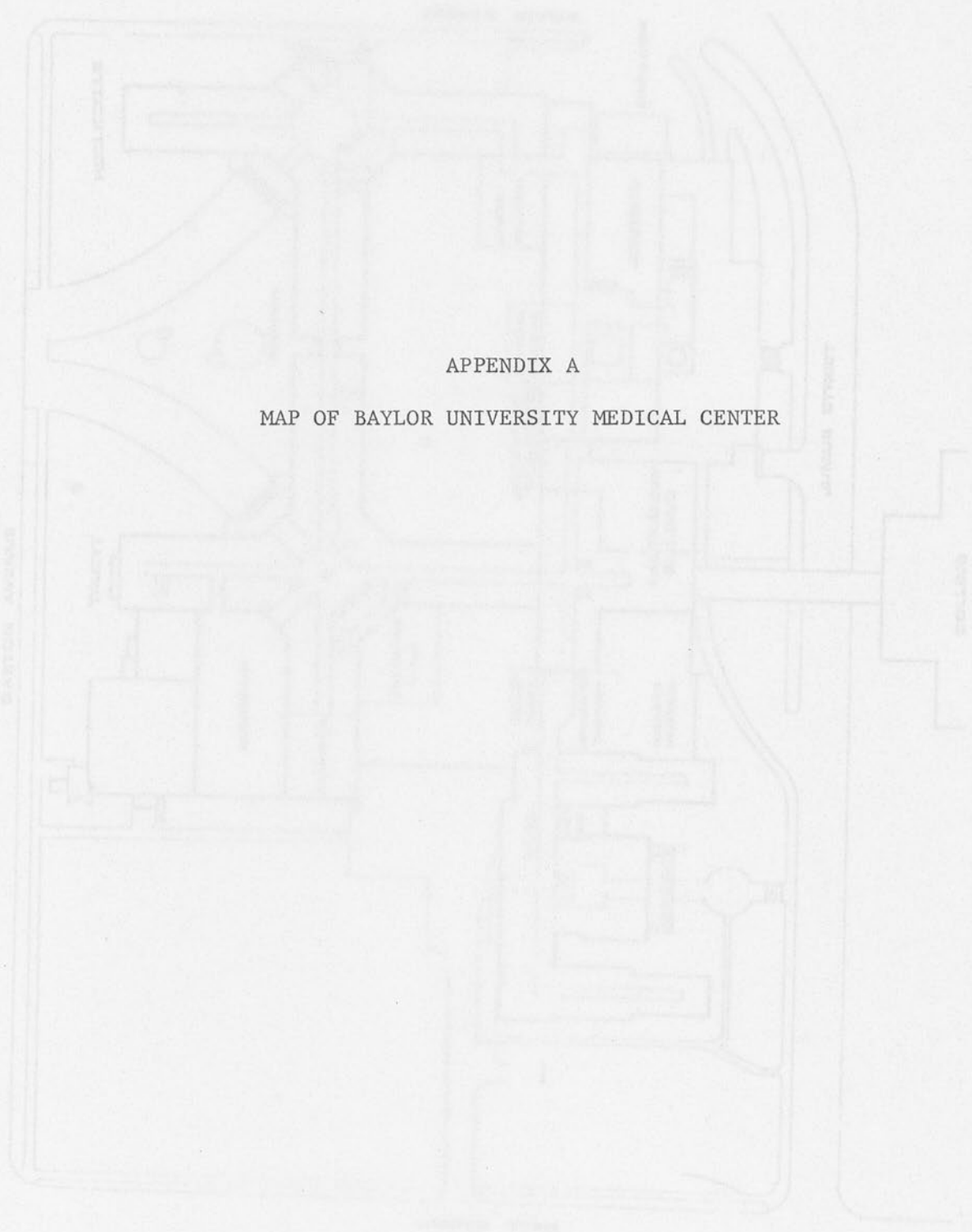
It was recommended that:

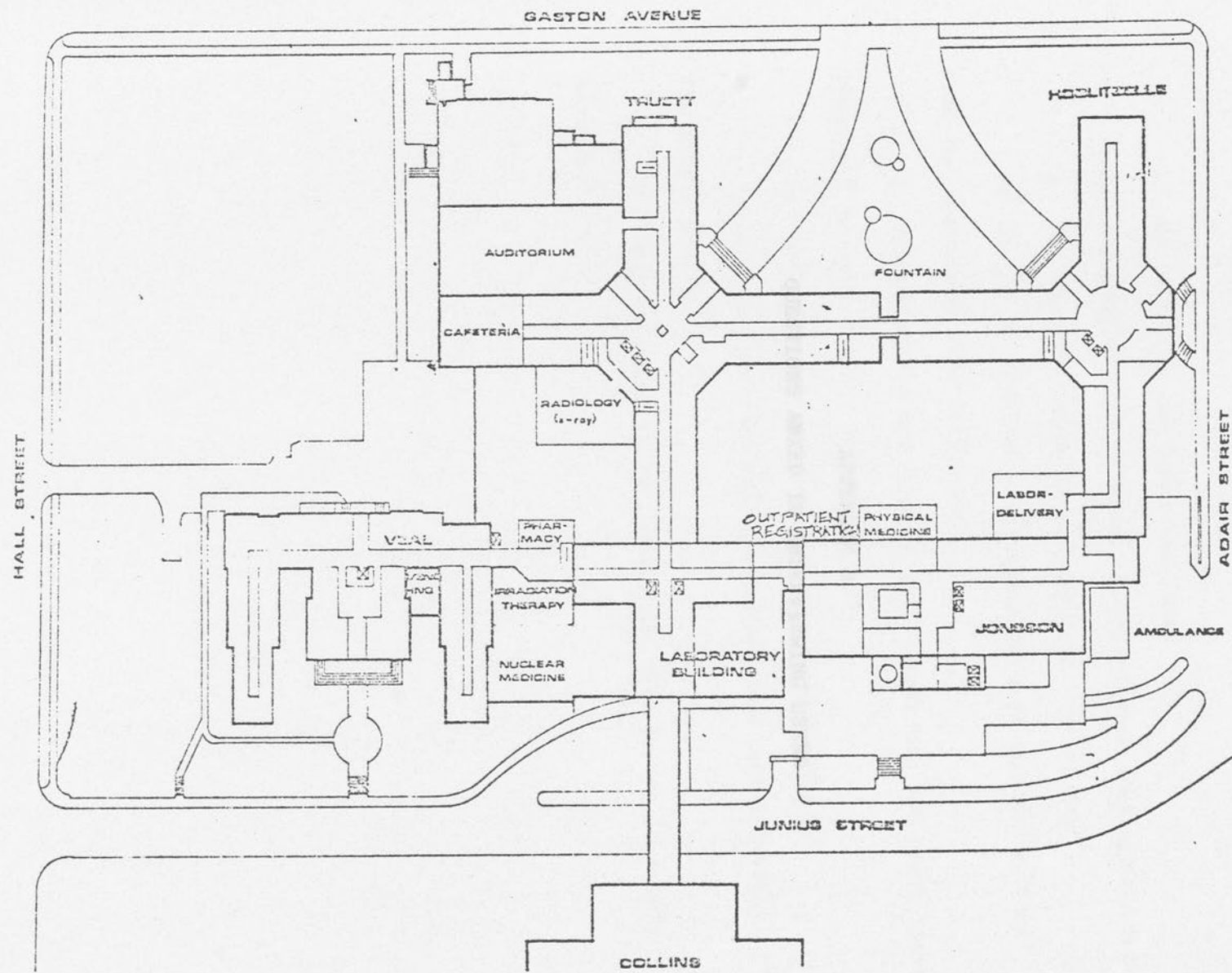
1. Storage space in the Baylor University Medical Center be increased to the recommended minimum.
2. A detailed study be carried out to determine the best way to achieve the needed increase in storage space, giving primary consideration to an offsite warehouse.
3. A plan be implemented to apply the findings of the study.
4. Until storeroom space is increased to the recommended minimum, the following actions be taken:
  - a. The purchasing director and the storeroom manager establish and put into writing storeroom operating policies consonant with Center objectives, prepare and publish procedures for storeroom operations, and prepare written job descriptions for all storeroom employees.
  - b. The Center's supply catalogs be corrected to reflect current prices, items carried in stock, and revised units of issue.
  - c. The inventory situation be studied to preclude discrepancies in inventory accounting.
  - d. Standing order items be so identified in the general storeroom.
  - e. Storage bins, shelves, pallets, and storage areas be numbered and marked with the item stock number, the unit of issue, and the item description.

- f. The receiving office be set up in the rear of the storeroom.
- g. One additional storeroom employee be hired.
- h. Dietary storeroom items needed for isolation be placed in a central location.
- i. A food cart with controls to ensure safe handling be obtained.
- j. Kitchen personnel assist the dietary storeroom clerk in unloading and storing delivered items.

APPENDIX A

MAP OF BAYLOR UNIVERSITY MEDICAL CENTER





QUESTIONS ASKED IN INTERVIEWING USERS

1. How often do you order supplies?
2. Are supplies and materials received when they are needed?
3. Are they delivered at a convenient time of day?
4. Do you receive the wrong quantities or the wrong items from the storeroom? How frequently?
5. Approximately how many of your orders are for stock listed items and how many are for special orders?

APPENDIX B

QUESTIONS ASKED IN INTERVIEWING USERS

1. Are you satisfied with the support and responsiveness of the supply system?
2. What changes, if any, would you like to see in supply services?

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1. How often do you order supplies?
2. Are supplies and materials received when they are needed?
3. Are they delivered at a convenient time of day?
4. Do you receive the wrong quantities or the wrong items from the storeroom? How frequently?
5. Approximately how many of your orders are for stock listed items and how many are for special orders?
6. How often are stock listed items not available?
7. Are you satisfied with the support and responsiveness of the supply system?
8. What changes, if any, would you like to see in supply services?





**BAYLOR UNIVERSITY MEDICAL CENTER  
DIETARY REQUISITION-1**

OFFICE OR DIVISION \_\_\_\_\_  
 BAYLOR  0  1  
 OTHER  \_\_\_\_\_  
 CO. \_\_\_\_\_ GEN. \_\_\_\_\_ SUB. \_\_\_\_\_ DEPT. \_\_\_\_\_ PROG. \_\_\_\_\_ FUND \_\_\_\_\_ DOC. \_\_\_\_\_

DATE \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

ITEM NUMBER	NUMBER CHECKED	STORAGE LOCATION	ISSUE QTY.	ITEM DESCRIPTION	ITEM NUMBER	NUMBER CHECKED	STORAGE LOCATION	ISSUE QTY.	ITEM DESCRIPTION
88010		AA-1	Box	Pecan, Pieces, 30 Lb. Box	88070		AA-30	Jar	Peanut Butter, 2 1/2 Lb.
88020		AA-2	Box	Coconut, 25 Lb. Box	88072		AA-31	Jar	Honey, Burlison, 4 Lb.
88030		AA-3	Box	Coffee, Decaffeinated, Individual Pkg.	88073		AA-32	Bag	Marshmallows, 1 Lb.
88032		AA-4	Cs	Rice, Wild, Uncle Ben's, Long Grain	88074		AA-33	Bag	Crackers, Meal, 5 Lb.
88034		AA-5	Box	Cream-of-Rice, 1 Lb.	88075		AA-34	Cs-300	Crackers, No. 552
88036		AA-5-1	Box	Scotch Barley, 1 Lb.	88077		AA-35	Box	Vanilla Wafers
88038		AA-6	Box	Oatmeal, 42 Oz.	88078		AA-35-1	Box	Crackers, Banquet
88040		AA-7	Box	Relston, 18 Oz.	88080		AA-36	Cs-300	Crackers, Salt Free
88041		AA-8	Box	Malt-O-Meal, 24 Oz.	88081		AA-37	Box	Melba Toast
88042		AA-9	Box	Petty Johns, 14 Oz.	88083		AA-38	Box	Crackers, Graham
88044		AA-10	Box	Grits, 20 Oz.	88084		AA-39	Pkg.	Toast, Husk-Holland
88045		AA-11	Box	Farina, 28 Oz.	88085		AA-40	Cs-280	Crackers, No. 540
88047		AA-12	Box	Cream-of-Wheat, 28 Oz.	88086		AA-41	Pkg.	Cookies, Butter
88048		AA-13	Cs-50	Wheaties, 1 Oz.	88087		AA-42	Pkg.	Cookies, Sugar
88049		AA-14	Cs	Product 19, 1 Oz.	88088		AA-43	Pkg.	Cookies, Hydrox
88050		AA-15	Cs	Bran Flakes, 1 Oz.	88090		AA-44	Box	Spaghetti, Long, 10 Lb.
88051		AA-16	Cs-50	Raisin Bran, 1 Oz.	88091		AA-45	Box	Noodles, Medium, 10 Lb.
88053		AA-17	Cs-50	Puffed Rice, 1 Oz.	88092		AA-46	Box	Macaroni, Cut, Elbow, 10 Lb.
88054		AA-18	Cs-50	Puffed Wheat, 1 Oz.	88093		AA-47	Box	Uneeda Biscuits
88056		AA-19	Cs-50	Rice Krispies, 1 Oz.	88094		AA-48	Cs	Paygel, No. 10
88057		AA-20	Cs	Frosted Flakes, 1 Oz.	88095		AA-49	Cs-6	Pudding, Chocolate, Instant, Delmark
88059		AA-21	Cs	Cornflakes, 1 Oz.	88096		AA-50	Cs-6	Pudding, Butterscotch, Instant, Delmark
88060		AA-22	Cs-50	Shredded Wheat, 1 Oz.	88097		AA-51	Cs-6	Pudding, Vanilla, Instant, Delmark
88061		AA-23	Cs	All Bran, 1 Oz.	88098		AA-52	Cs-6	Custard Mix, Egg, 3 1/2 Lb.
88062		AA-24	Cs-50	Special K, 1 Oz.	88100		AA-52-1	Pkg.	Custard, Diet, 1 Oz. Pkg.
88063		AA-25	Box	Baking Soda, 1 Lb.	88110		AA-53	Can	Pudding, Lemon, No. 10
88064		AA-26	Bag	Cornflake Crumbs, 5 Lb. Sk.	88112		AA-54	Cs-6	Tapioca Mix, Delmark, 3 Lb.
88065		AA-27	Can	Baking Powder, 10 Lb.	88115		AA-55	Bag	Eggnog Mix, 2 Lb.
88067		AA-28	Can	Syrup, Karo, 5 Lb.	88116		AA-56	Bag	Milk Shake Mix, 5 Lb.
88069		AA-29	Gal.	Molasses, 1 Gal.	88117		AA-57	Can	Nuts, Mixed, Salted, 1 Lb.

**GRAND TOTAL**

Requisitioned By \_\_\_\_\_ Approved By \_\_\_\_\_

Received By \_\_\_\_\_ Date \_\_\_\_\_

- WHITE - Storeroom Copy, to be costed and forwarded to Accounting
- YELLOW - Cost Copy, to go to Storeroom, costed by Stock Record Clerk & returned to originator.
- PINK - Retained by Originator.

**BAYLOR UNIVERSITY MEDICAL CENTER  
GENERAL OFFICE SUPPLIES  
REQUISITION-1**

OFFICE OR DIVISION

I  G  I BAYLOR  0  0  1  
 OTHER  CO. GEN. SUB. DEPT. PROG. FUND DOC.

DATE / /

STOCK NO.	NUMBER ORDERED	CATALOG NUMBER	ISSUE QTY.	ITEM DESCRIPTION	STOCK NO.	NUMBER ORDERED	CATALOG NUMBER	ISSUE QTY.	ITEM DESCRIPTION
03160		B 46	Each	Scissors, Utility, 7"	69320		U 138	Box-100	Carbon Paper, Typewriter, 8 1/2" x 11 1/2"
					69322		U 138-2	Each	Binder, TBC, 11 x 14 1/4"
					66781		U 138-3	Pkg	Indexes, Arco CI-213-8
					69211		U 138-4	Each	Sheet Protectors 8 1/2" x 11"
66291		U28-1	EA	PEN, FELT TIP, RED	69390		U 139	CASE	Paper, Xerox
66010		U 1	Each	Pencil, China Marking, Brite Red	69400		U 140	Doz.	Clamps, Paper
66049		U 4	Each	Pencil, Marking, Black	69450		U 145	Pkg-100	Cards, Index 3" x 5", Unruled
66050		U 5	Each	Pencil, Checking, Red	69460		U 146	Pkg-100	Cards, Index, 3" x 5", Ruled
66090		U 9	Each	Pad, Stamp, Black, Size 1	69500		U 150	Each	Pad, Scratch, 4" x 6"
66140		U 14	Each	Eraser, Pencil, Pink Rubber	69510		U 151	Each	Pad, Scratch, 5 1/2" x 8 1/2"
66200		U-20	Each	Liquid paper thinner	69520		U 152	Each	Pad, Work, Legal, Ruled
66230		U 23	Btl-4oz.	Liquid Paper	69530		U 153	Each	Pad, Worksheet, 4 Col., 8 1/2" x 14"
66281		U165	BOX	NCR PAPER	69570		U 157	Roll	Tape, Cellophane, 1/2"
66250		U 25	Box-50	Fasteners, File	69580		U 158	Roll	Tape, Cellophane, 1/2"
66260		U 26	Box-5000	Staples, Bostitch, 1/2"	69590		U 159	Box 100	Clip, Paper, Gem # 1
66290		U 29	Each	Pen, Felt Tip, Black	69630		U 163	Box-1/2 lb.	Bands, Rubber, Size 16
66530		U 53	Each	Ribbon, Typewriter, I.B.M., Carbon	69640		U 164	Roll	Paper, Adding Machine, 2 1/4"
66660		U 66	Each	Binder, Notebook, w/3 Fasteners	69701		U 169	Each	Pen, Ball Point, Red
66670		U 67	Each	Binder, Loose Leaf, 3 Ring, 6" x 9 1/2"	69700		U 170	Each	Pen, Ball Point, Black
66690		U 69	Each	Binder, 8 1/2" x 11", 3 Ring	69710		U 171	Doz.	Pencil, Lead # 3
66830		U 83	Btl-4 oz.	Cement, Rubber, Transparent	69720		U 172	Doz.	Pencil, Lead #2 1/2
66870		U 87	Box-1000	Tags, Marking, Dennison 42B	69730		U 173	Doz	Pencil, Lead # 2
66910		U 91	Each	Binder, Nylon Post, 14 1/4" x 11"	69780		U 178	Each	Folder, File, Manila, Plain
66960		U 96	Each	Notebook, Steno, Spiral, 6" x 9"	69790		U 179	Each	Envelope, 10" x 13", Klasp
66970		U 97	Each	Notebook, Champion, 9" x 11"	69800		U 180	Each	Envelope, 12" x 15 1/2", Klasp
69020		U 102	Each	Stapler, Bostitch	69810		U 181	Each	Envelope, 6 1/2" x 9 1/2", Klasp
69130		U 113	Each	Remover, Staple	69820		U 182	Each	Envelope, 7" x 10", Klasp
69220		U 122	Box-150	Reinforcements, Paper, Gummed	69840		U 184	Each	Envelope, 9" x 12", Klasp
69221		U 122-1	Each	Binder, TBC, 8 1/2" x 11 1/4"	69850		U 185	Each	Folders, File, Manila, Rt. Tab
69350		U 135	Each	Pad, Scribble	69910		U 191	Pkg-8000	Paper, Sulphite Bond, White, # 16
69353		U 135-3	Pkg-40	Ko-Rec-Type	69920		U 192	Box-500	Envelopes, Business Reply, # 9
69354		U 135-4	Pkg-24	Ko-Rec-Copy	72010		U 201	Each	Box, Record, 15" x 10 1/2" x 24"
69370		U 137	Box-100	Carbon Paper, Typewriter, 9 1/2" x 12 1/2"	72030		U 203	Each	Blotters, Desk

Requisitioned By \_\_\_\_\_ Approved By \_\_\_\_\_ **GRAND TOTAL**

Received By \_\_\_\_\_ Date \_\_\_\_\_

**WHITE** - Storeroom Copy, to be costed and forwarded to Accounting  
**YELLOW** - Cost Copy, to go to Storeroom, costed by Stock Record Clerk & returned to originator.  
**PINK** - Retained by Originator.



# BAYLOR UNIVERSITY MEDICAL CENTER NURSING SERVICE SUPPLIES REQUISITION - 1

Office or Division \_\_\_\_\_

Chart of Accounts No. \_\_\_\_\_ Date \_\_\_\_ / \_\_\_\_ / 19\_\_

STOCK NO.	NUMBER ORDERED	CATALOG NUMBER	ISSUE QTY.	ITEM DESCRIPTION	STOCK NO.	NUMBER ORDERED	CATALOG NUMBER	ISSUE QTY.	ITEM DESCRIPTION
00010		A 1	Roll	Tissue, Toilet					
00020		A 2	Roll	Towels, Paper, "West Sanifiber"					
00230		A 23	Pkg-100	Bags, Paper, 1 lb.					
00240		A 24	Pkg-100	Bags, Paper, 4 lb.					
00260		A 26	Pkg-100	Bags, Paper, 16 lb.	09040		D 4	Case-200	Wipes, Cellulose, 5" x 8 1/2", Box
00262		A 27	Box-500	Band, Toilet Seat	09280		D 28	Box-90	Bandage Roll, "Nu-Wrap", 2" x 10 yds.
00300		A 30	Each	Bags, Paper, 1/2 Barrel	09313		D 31-3	Box-24 rls	Tape, Surgical, 1/2" x 10 yds.
00310		A 31	Roll	Cellophane Sheets, 40" x 200'	05314		D 31-4	Box-12 rls	Tape, Surgical, 1" x 10 yds.
00320		A 32	Box-200	Straws, Glad, Plastic	09315		D 31-5	Box-6 rls	Tape, Surgical, 2" x 10 yds.
00350		A 35	Box-250	Cup, Souffle, #59	09320		D 32	Can-1 rls	Tape, Adhesive, 2" x 10 yds.
00361		A 36 1	Pkg-100	Labels, Drug Sensitivity	09330		D 33	Can-1 rls	Tape, Adhesive, 1" x 10 yds.
00380		A 38	Box-100	Cup, Medicine, Plastic, 1 oz.	09520		D 52	Box-100	Band-Aid, Butterfly Closure
00400		A 40	Each	Cup, Denture, w Lid					
00450		A 45	Box-100	Cup, Water, #58, 5 oz., "B.U.M.C."					
00470		A 47	Pkg-250	Towels, Paper, White, "C" Fold					
00490		A 49	Each	Cup, Specimen, w Lid, 1/2 pt.	12020		E 2	Each	Tray, Ash, Glass
00590		A 59	Case-200	Pitcher, Water, Disposable, 32 oz.	12370		E 37	Each	Tube, Drinking, Bent, 8"
					12460		E 46	Each	Glass, Fluid Intake, 8 oz.
					18040		G 4	Each	Gloves, Finger, Latex, Medium
					18191		G 19-1	Each	Flex-A-Temp, Body Pack, 4 1/4" x 7 1/2"
					18192		G 19-2	Each	Flex-O-Temp, Truett
03010		B 1	Bar- 1 oz.	Soap, Hand, Wrapped, "Coles"	18193		G 19-3	Each	Freez-A-Bag, #11425-020
03020		B 2	Can- 14oz	Cleanser, "Ajax", Red Label	18194		G 19-4	Each	Freez-A-Bag, 3 1/2" x 4", Eye Pack
03030		B 3	Box- 37oz	Powder, Dishwashing KOL					
03150		B 15	Bar- 1 oz.	Soap, Hand, Wrapped, "Ivory"					
03180		B 18	Gal.	Cleaner, "Alcodine"	30230		JD 23	Each	Needle, Disposable, 19G-1 1/2"
00340		B 34	Each	Mop Dish	30240		JD 24	Each	Needle, Sterile, 20G-1"
03420		B 42	Each	Brush, Hand Scrubbing	30250		JD 25	Each	Needle, Sterile, 21G-1"
03490		B 49	Each	Dish, Soap, Plastic, Aqua	30260		JD 26	Each	Needle, Sterile, 21G-1 1/2"
03520		B 52	Can-20 oz	Deodorizer, Mist, Spray Can	30270		JD 27	Each	Needle, Sterile, 23G-1"
03750		B 75	Each	Soap, Baby Bath, Mennen	30280		JD 28	Each	Needle, Sterile, 25G-1"

Requisitioned By \_\_\_\_\_ Approved By \_\_\_\_\_ **GRAND TOTAL**

Received By \_\_\_\_\_ Date \_\_\_\_\_

WHITE - Storeroom Copy, to be costed and forwarded to Accounting  
 YELLOW - Cost Copy, to go to Storeroom, costed by Stock Record Clerk & returned to originator.  
 PINK - Retained by Originator.

# BAYLOR UNIVERSITY MEDICAL CENTER NURSING SERVICE SUPPLIES REQUISITION - 2

Office or Division \_\_\_\_\_

Chart of Accounts No. \_\_\_\_\_ Date \_\_\_\_ / \_\_\_\_ / 19 \_\_\_\_

STOCK NO.	NUMBER ORDERED	CATALOG NUMBER	ISSUE QTY.	ITEM DESCRIPTION	STOCK NO.	NUMBER ORDERED	CATALOG NUMBER	ISSUE QTY.	ITEM DESCRIPTION
30290		JD 29	Each	Needle, Sterile, 26G-1 1/2"					
36022		L 2 2	Box-100	Soap, Enema, Castille, Liquid					
36610		L 61	Pair	Slippers, Bath, Paper					
36710		L 71	Each	Clamp, Shut-Off, Large					
36790		L 79	Pkg-5	Blades, Razor, "Gillette - Blue"					
39010		L 101	Each	Battery, Flashlight, Size "D"					
39070		L 107	Box-1450	Pins, Safety, #3, 2"	54080		P 8	Gal.	Soap, Surgical, Phisohex
39080		L 108	Box-1440	Pins, Safety, #2, 1 1/2"	54061		P 8-1	Box-100	Soap, Surgical, Phisohex, 1/2 oz.
39180		L 118	Box-100	Spoon, Plastic, Blue					
					66050		U 5	Each	Pencil, Checking, Red
					66230		U 23	Bl	Liquid paper, 5 oz.
					69371		U 137-1	Box-100	Carbon paper, 8 1/2" x 11"
51300		OD 30	Box-100	Syringe, Disp., 2 1/2cc, w/o needle	69400		U 140	Doz.	Clamp, Paper, "Triumph #1"
51301		OD 30-1	Box-100	Syringe, Disp., 2 1/2cc, w/25 - 1"	69500		U 150	Each	Pad, Scratch, 4" x 6"
51302		OD 30-2	Box-100	Syringe, Disp., 2 1/2cc, w/23 - 1"	69510		U 151	Each	Pad, Scratch, 5 1/2" x 8 1/2"
51303		OD 30-3	Box-100	Syringe, Disp., 2 1/2cc, w/21 - 1 1/2"	69580		U 158	Roll	Tape, Cellophane, 1 1/2"
51310		OD 31	Box-50	Syringe, Disp., 5cc, w/o needle	69590		U 159	Box-100	Clips, Paper, Gen #1, Wire
51320		OD 32	Box-50	Syringe, Disp., 10cc, w/o needle	69630		U 163	Box-25lb	Band, Rubber, size 16R
					69701		U 169	Each	Pen, Ball Point, Red
					69700		U 170	Each	Pen, Ball Point, Black
					69710		U 171	Doz.	Pencil, Lead #3
					69720		U 172	Doz.	Pencil, Lead #2 1/2
					69730		U 173	Doz.	Pencil, Lead #2

**GRAND TOTAL**

Requisitioned By \_\_\_\_\_ Approved By \_\_\_\_\_

Received By \_\_\_\_\_ Date \_\_\_\_\_

- WHITE - Storeroom Copy, to be costed and forwarded to Accounting
- YELLOW - Cost Copy, to go to Storeroom, costed by Stock Record Clerk & returned to originator.
- PINK - Retained by Originator.











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States Air Force in 1949. He was an enlisted member of the Air Force until 1963 when, under the auspices of the Airman's Education and Commissioning Program, he was sent to Florida State University. Upon receiving a Bachelor of Science degree in Management and Finance in 1970, Captain Brandler completed Officer Training School and was awarded a commission that year.

In 1972 he completed an advanced course in Health Services Administration at Sheppard Air Force Base, Texas, and in 1974 he completed Squadron Officers School at Maxwell Air Force Base, Alabama.

Captain Brandler's assignments have included Wiesbaden Air Force Base, Germany; Eglin Air Force Base, Florida; Plattsburgh Air Force Base, New York; and MacDill Air Force Base, Florida. In August, 1974, he entered the U.S. Department of the Army's University Program in Health Care Administration. Upon completion of the formal course of instruction he was assigned to Wilford Hall U.S.A.F. Medical Center, Lackland Air Force Base, Texas, for non-duty training.

Captain Brandler is married to the former Audrey Pronger Payne and they have two children.

BIOGRAPHICAL SKETCH

Captain Sidney Brandler [REDACTED]

[REDACTED], and resided there until he enlisted in the United States Air Force in 1959. He was an enlisted member of the Air Force until 1968 when, under the auspices of the Airman's Education and Commissioning Program, he was sent to Florida State University. Upon receiving a Bachelor of Science degree in Management and Finance in 1970, Captain Brandler completed Officer Training School and was awarded a commission that same year.

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