

A QUANTIFICATION OF QUALITY OF PHARMACEUTICAL
PATIENT CARE IN HOSPITALS OF HOUSTON

A Thesis

Presented to

The Faculty of the College of Pharmacy
Univeristy of Houston

In Partial Fulfillment
of the Requirements of the Degree
Master of Science

by

Ann Myrtle Guenther

August 1971

592525

. ACKNOWLEDGEMENTS

I wish to acknowledge my indebtedness to Dr. Dewey D. Garner for his patience, guidance and encouragement, and to Mr. Herman L. Lazarus for his assistance throughout this project.

I also wish to express my appreciation to Dean Noel M. Ferguson and to the members of my committee.

To my family and friends, for the many kindnesses extended to me during this time, I wish to express my sincere thanks.

A QUANTIFICATION OF QUALITY OF PHARMACEUTICAL
PATIENT CARE IN HOSPITALS OF HOUSTON

An Abstract of a Thesis

Presented to

The Faculty of the College of Pharmacy
University of Houston

In Partial Fulfillment
of the Requirements of the Degree
Master of Science

by

Ann Myrtle Guenther

August 1971

ABSTRACT

The objectives of this study were to evaluate the quality of pharmaceutical services according to the structure and process components of the Donabedian model and to investigate the relationship between these elements. In addition, several factors which might contribute toward the quality of care were investigated to explore their relationships with each of these two quality components.

For this study a list of all hospitals in the Houston area was compiled. An interview schedule was prepared for use in personal interviews with the individual in charge of drug distribution in each institution. All inquiries investigated either structure or process components of pharmaceutical patient care and were based on J.C.A.H. accreditation standards and on A.S.H.P. statements. The questions were scored by assigning one point each time the hospitals met these standards. Cumulative scores for each institution were obtained by totaling the number of points in each category.

After subjecting the data to statistical analysis, a positive correlation was found between the structure and process components of quality. This relationship is a linear functional one. No correlation was found between the acti-

vity of the Pharmacy and Therapeutics Committee and either process or structure scores. Hospitals employing full-time pharmacists have significantly higher components of structure and of process than those employing only consultant pharmacists. Hospitals of 400 beds and over have significantly higher structural components of care than smaller hospitals. Hospitals of 100 beds and over have significantly higher process components than smaller hospitals. Non-profit institutions have significantly higher components of structure and process than profit-making institutions. Government owned hospitals have significantly higher components of structure than non-government, profit-making institutions. No significant difference was found in the structure of non-government, non-profit hospitals and either government owned or non-government, profit-making institutions. Both government owned hospitals and non-government, non-profit hospitals have significantly higher components of process than non-government profit-making insitutions. No significant difference was found in the process variables in government owned hospitals and non-government, non-profit ones. Both structure and process were significantly higher in hospitals employing individuals who have completed a Master's Degree or a residency

in hospital pharmacy than in those employing full-time B.S. pharmacy graduates. Both structure and process scores were found to be significantly higher in hospitals utilizing at least one defined "advanced" pharmaceutical service.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
OBJECTIVES OF THE STUDY	2
II. HISTORICAL REVIEW OF THE LITERATURE	4
III. PARAMETERS FOR DEFINING PHARMACEUTICAL PATIENT CARE	14
ADAPTATION OF THE MODEL	14
DEFINITIONS AND DISCUSSION	18
IV. METHODOLOGY	22
V. RESULTS	25
DATA	25
ANALYSIS	45
VI. DISCUSSION OF RESULTS	55
VII. SUMMARY	62
BIBLIOGRAPHY	64
APPENDIX I	71
APPENDIX II	73
APPENDIX III	75
APPENDIX IV	79

TABLE OF TABLES

TABLE	PAGE
I. RESULTS OF PRELIMINARY SURVEY	26
II. STRUCTURE, PROCESS AND DUPLICATION SCORES . . .	27
III. PROCESS SCORES DICHOTOMIZED AT MEAN- TO DUPLICATION SCORES	29
IV. STRUCTURE, PROCESS AND DUPLICATION SCORES BY ACTIVE COMMITTEE ARRANGEMENT	30
V. STRUCTURE, PROCESS AND DUPLICATION SCORES BY NO ACTIVE COMMITTEE ARRANGEMENT	31
VI.. STRUCTURE AND PROCESS SCORES BY PHARMACIST EMPLOYMENT ARRANGEMENT	32
VII. STRUCTURE SCORES DICHOTOMIZED AT MEAN- TO DUPLICATION SCORES	34
VIII. STRUCTURE SCORES BY BED CAPACITY ARRANGEMENT .	35
IX. PROCESS SCORES BY BED CAPACITY ARRANGEMENT . .	36
X. STRUCTURE AND PROCESS SCORES BY CONTROL ARRANGEMENT	37
XI. STRUCTURE AND PROCESS SCORES BY PROFIT AND NON-PROFIT ARRANGEMENT	39
XII. STRUCTURE AND PROCESS SCORES BY ADVANCED DEGREE OR RESIDENT EMPLOYMENT ARRANGEMENT . . .	41
XIII. STRUCTURE AND PROCESS SCORES BY ADVANCED AND NON-ADVANCED SERVICE ARRANGEMENT	43

CHAPTER I

INTRODUCTION

Noticeable efforts have been made within the health care systems of this country, almost since its origin, to increase standards and thus improve the quality of care provided to the people. Members of the health professions through the years have committed themselves to "continuing efforts to provide the best possible quality of care to patients and to constant improvements of this care when this is possible" (1). Now with the advancements in communications, the changes within our social system and increased government participation, health care services provided to the citizens of this nation have become a matter of unprecedented concern to all. There has been a heightened investigation into the quality of services provided as activities within the hospital have moved closer to the public eye. Federal legislation has now made these institutions more responsible for monitoring services provided to its patients (2). Substantial attention has been given to increasing the effectiveness of routine medical audits (3-4-5-6). With the realization that "patient care" must be enlarged to incorporate all aspects of an individual's stay in the hospital, (7) recommendations have been made that

similar systems, to increase the quality of patient care, be utilized by members of paramedical professions (8-9).

Parallelling these trends there has been increased attention given to the problems of defining and measuring quality. Within recent years several plans have been proposed for identifying its concrete components in order to assess a seemingly abstract entity.

OBJECTIVES OF THE STUDY

It is the primary objective of this study to evaluate the quality of pharmaceutical services according to the structure and process components of the Donabedian (10) model and to investigate the relationship between these elements. It is intended to analyze the effect of employment of full-time pharmacists to consultant pharmacists, and to explore the relationships between the components of quality of pharmaceutical patient care and the Pharmacy and Therapeutics Committee. The results of these investigations in metropolitan hospitals are to be compared with the results of the works of Lazarus (11) and Brown (12) in hospitals serving primarily a rural population. The data collected here are also to be used in analyzing the relationships between quality components and the bed capacity of hospitals, control or ownership of institutions, the profit-motive, and utilization of at least one defined "advanced" pharmaceutical service. In addition, it is to be used in exploring the effect of employment of pharmacists who graduated with a Master's degree or completed a residency program in hospital pharmacy to Bachelor of Science pharmacy graduates.

CHAPTER II

HISTORICAL REVIEW OF THE LITERATURE

Despite the abundance of the literature that has been published on research into the quality of health services, the term quality is one that eludes precise definition (13). For the purpose of different studies, it has assumed a variety of definitions ranging from a measure of the performance of a system (14) to a measure of various components of a system or multitude of systems (15). Donabedian has referred to it as "value judgments that are applied to several aspects, properties, ingredients or dimensions of a process called medical care" (16).

If the definition is difficult, its measure is even more difficult. Basically the problems encountered in assessment involve defining valid and reliable measures of quality and evaluating these measures when made (17). The "ultimate validator" of the quality of care is its success at producing health and satisfaction among the recipients. The valid use of other indices as a measure of care depend on their relationship to this desired result (18). Reliability or reproducibility of the results is an important qualification, particularly because the measure of quality involves judgment. A detailed specification of

the standards and criteria used is a valuable aid in raising the level of reliability (19).

Measurement by definition involves a comparison of one thing to another. It is dependent on standards which can be derived from two sources. Normative standards are those that are derived from textbooks, publications, highly qualified professionals, or any other legitimate bodies of knowledge and values within the analyzed system. Empirical standards are those that are derived from actual practice. In the health care system they depend on levels of care that are known to be attainable. They are used to compare situations existing in one place with those in another (20).

The variables that have been measured in the assessment of patient care have been categorized by several authors (17-15-21). Such classifications are based on the premise that the system of medical care delivery can be divided into a number of defined components.

The first of these variables is structure. An investigation of this component examines such things as physical facilities and equipment, organizational characteristics and qualifications of personnel involved in the care system. This technique is commonly employed by accreditation agencies by judging these variables within an institution according

to their compliance with established standards. The normative values of such studies vary according to the purpose of the evaluation. They can be minimum desirable levels or comparative ones established by regional or national averages. Because of the relative ease of evaluation of such concrete criteria and the accessibility of necessary information, this type of analysis can be performed with a maximum efficiency of both time and money. The use of this technique implies that these variables are essential components of the care system and that given these components, a desirable level of care can be reached (17). While structural measurement provides only an indirect measure of care, structural elements have been demonstrated in research to have significant effect in medical treatment (22-23).

Another approach to the problem is the assessment of elements of performance of the professionals functioning within the system (17). This approach focuses on total patient care (21) and continuity of treatment by both medical and paramedical personnel (24). Studies of this type have concentrated on length of patient stay (25), utilization rates of x-ray, pharmacy, central supply and other ancillary services (26). Although the validity of many of the indices

used in this type of evaluation has received much criticism (27-28), because of the magnitude of the problem involved in evaluation and the capability of utilizing technical and non-professional personnel, it has been recommended as the most feasible one for routine medical care assessments (29). In addition, as our hospitals become more complex and more highly organized, we are becoming more cognizant of the growing need to evaluate the care given by the institution as a unit. Fragmented analysis may easily overload many essential components of the health care delivery system (30).

The concept of periodic analysis of the professional's performance by peer groups received national acceptance in 1970 (31). DeGayndt refers to this method of quality measurement as an appraisal of content. This seeks to answer the question of whether medicine has been properly practiced (13). Probably one of the greatest difficulties in judging performance is establishing objective criteria by which it can be measured. A noticeable effort at solving this problem empirically was made by Sanazaro and Williamson in a survey of over 2,000 practitioners. In each case reported, the performance of the practitioner resulted in specific effects upon the patient. The incidents of performance were described and categorized by the authors into

types of activity (32).

Many peer reviews by physicians have utilized medical records as the primary source of information (13-5-33), but the value of these documents as a source for research data has given rise to a great deal of contention (34-35). As Gonnella points out, many of the studies using these techniques often lack objective data about the pathological state of the population tested (36). Other studies have utilized direct observation for the collection of data (37), but this method may be limited by the degree of bias introduced into the inquiry.

In order to obtain quantitative ratings by this technique, it is necessary to define individual aspects of care and to weigh carefully each assigned numerical value. Phaneuf has reported the use of an audit that separates nursing functions into seven categories and rates each of these on a two hundred point scale (38).

The difficulties in arriving at definitions and the weight of specific criteria has at times been circumvented by basing the analysis simply on a judgment of relative quality by those who are familiar with the services of the sample tested (39).

Donabedian has grouped the evaluation of performance and content into one category called process (16). Though

it is necessary to contend with certain flaws inherent within this method of analysis, an investigation of process is considered a more direct and more relevant evaluation than one of structure.

The most direct analysis of care is an assessment of the effects upon the patient. This is the study of outcome (16), or end-result (40). Investigations using this approach have been based on mortality ratios, pathological conditions of surgically removed tissue (41) and recuperation of physically handicapped patients (42). Some limiting factors to this approach are the numerous variables that can influence the outcome, the probability of attaining the desirable end-result in a given situation, and the difficulty in establishing criteria for its definition that make it relevant to the question (43). A measure of outcome, however, remains the most direct approach to the problem. Studies combining process and outcome have been easily adapted to paramedical professions to determine the relative merit of different regimens of care for the patient (44-45-42).

An indirect approach to outcome rates quality on the basis of how well care, associated with the desired end-result, is provided. Studies of this type involve complex

methods of analysis that include acceptability of services, utilization by the populous, and appropriateness of treatment (24-46). Because it encompasses such a critical evaluation of all these variables, this has been differentiated into a separate category of impact (21).

In contrast to the literature available on investigations into the quality of care provided by members of the medical profession, there is a paucity of information regarding similar work in the area of pharmacy.

Self appraising audits have been recommended by several authors as an educational tool for improving the quality of patient care in hospital pharmacies (47-48).

Probably the most complete inquiry into pharmacy service can be found in the Mirror to Hospital Pharmacy. The authors reported statistics obtained from a national survey on a variety of structure and process components of pharmacy practice (49).

While a number of studies have been made that have investigated various aspects of pharmaceutical services, few have explored the relationship existing between the components of this health delivery system. Analyses of structure have been reported in two surveys in which the status of pharmacist employment was determined (50-51).

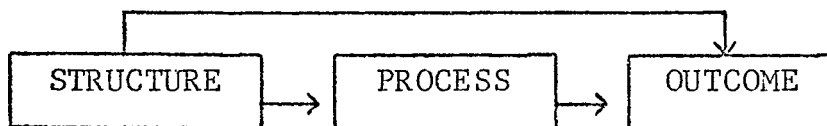
Other researchers have conducted drug utilization reviews which can be considered an analysis of process of the Department of Pharmacy and of the Pharmacy and Therapeutics Committees (52-53-54-55).

A noticeable contribution to the literature was made by Gibson and his co-workers, in a report of the quality of pharmacy services in the University System of Georgia. The authors quantified pharmacy care as measured by compliance with pharmacy standards of accrediting agencies. They further reported a correlation between the employment of a pharmacist and those institutions whose quality ranked highest in the sample (56).

The first effort to identify the indices of quality in this area according to any of the previously proposed methods of measurement was made by Lazarus in his survey of Mississippi hospitals that had less than one hundred beds. He reported a "strong positive correlation between the variables of structure and process" and found the components of process to be significantly higher in those hospitals employing full-time pharmacists (57). The duplication of this work by Brown in Mississippi hospitals with a capacity over one hundred beds later was in agreement with these results (58).

Five reported methods of measuring quality have been reviewed. Donabedian has restricted the classification of

measurable variables to the three components of structure, process, and outcome. He proposed a relationship between these three components as a chain of events. In this, each event serves as a means to an intermediate end. This, in turn, serves as a means to another end. Donabedian states, however, that these relationships are not yet fully understood (10). A schematic model for this proposal was presented by Lazarus as follows (59):



The relationship that had been suggested by Donabedian was identified for the first time by Lazarus in his research. This simultaneously quantified structure and process components of pharmaceutical services. After subjecting the scores to statistical analysis, Lazarus found a functional relationship to exist between these two variables of the Donabedian model (60).

A totally new approach to these studies was presented by Goss in 1970. After a comprehensive review of the literature of process and outcome research, Goss reported a relationship between organizational goals and quality of medical care. She reported that the quality of care rendered

in teaching hospitals is higher than that in non-teaching hospitals, and that the absence of the profit motive facilitates better medical care (61).

CHAPTER III

PARAMETERS FOR DEFINING PHARMACEUTICAL PATIENT CARE

ADAPTION OF THE MODEL

In order to adapt the Donabedian model to pharmaceutical patient care, it is necessary to categorize all elements of this care into one of these components of the model.

"Structural characteristics include all reasonably stable features of the organization within which care is provided" (62). These include adequacy of physical facilities and equipment, qualifications of personnel and the existence of many features which facilitate effective organization, for example, organizational charts, policy and procedure manuals and staff meetings. The establishment of fixed systems designed to increase control of narcotics and other dangerous drugs, to assure the excellence of the pharmaceuticals purchased, and to maintain the standards of those stored within the department and throughout the facility are also considered essential structural components of care. In assessing structure, attention is focused upon the existence of the system and not on the performance of the system.

The process of care is "viewed in terms of activities,

judgments and decisions of the providers" (62). The literature is replete with information on efforts that have been made in recent times to provide extended services by increasing the hours of coverage, by verifying the quality of pharmaceuticals manufactured and prepaced within the hospital, by providing intravenous solutions to the patient free from bacterial contamination and admixture incompatibilities, and by providing drug utilization reviews to the medical staff. Pharmacists have also made noticeable strides in providing in-service education to hospital personnel to increase their understanding of medication usage and thus increase the quality of patient care. The concept of the pharmacist working as a drug consultant, both in drug information services as well as in clinical areas is a newly emerging one that will provide new expressions of the process element. In assessing process, attention is focused upon the individual's ability to function within the system and not upon the existence of the system.

Outcome in pharmacy, as it is in other health care services, can be measured by its effects upon the patient. This can be measured by gauging the ability of the department to fulfill the five rights of dispensing and administering medication: the right drug, in the right amount, to the right patient, at the right time, and by the

right method of administration. Barker's study of medication errors before and after unit dose drug distribution can be considered an outcome measurement (63). Outcome studies can be justifiably measured only by gauging an individual's success at reaching the attainable goal. In those hospitals where nurses administer medication, an outcome of pharmacy service can be measured by determining the extent to which Pharmacy has reached its goals in the functions of dispensing and distributing medication. In those hospitals where administration of medicine is also a function of pharmacy service, an outcome study can be continued one additional step to the patient. Intravenous Additive Services might also be gauged by the quality of the product reaching the patient through intravenous solutions. Although more difficult to measure because of the question of clinical significance, the outcome of Drug Information Services should be measurable by determining the number of incompatibilities and drug interactions prevented by the information service. The effect of pharmacist-patient consultation might be measured in controlled studies by gauging the patient's understanding of the physician's orders before and after pharmacist contact and, in a more liberal sense, by patient satisfaction with services provided.

Extending an analysis of structure and of process to include an investigation of all the aspects of pharmaceutical care mentioned above would necessitate the use of empirical standards. For the purposes of this study, the definitions of structure and of process in relation to pharmaceutical services will be limited to the normative standards established by the J.C.A.H. and the A.S.H.P. The assessment of structure will be limited to the qualifications of personnel and to the adequacy of facilities and equipment as recommended by those agencies. The assessment of process will be limited to those activities and procedures specifically recommended by those organizations in the Standards for Pharmaceutical Services and in the Guidelines Relative to the Safe Use of Medications in Hospitals (64-65).

The fact that a relationship exists between the components of the Donabedian model has been well established (10-56-66-67). The complexity of that relationship has also been documented (68). A functional linear relationship between structure and process has been proposed (66). Applying this statement to the Donabedian model implies that the quality of pharmaceutical services can be determined by measuring any of the three components and that then "an inference can be made to the overall quality of

the system" (69).

DEFINITIONS AND DISCUSSION

Pharmaceutical Patient Care. "A final element in the framework that shapes and supports any system of quality appraisal is the definition of quality upon which that system rests" (70). Because of the difficulty in assessing all aspects of a complex system, an appraisal usually focuses on a few facets of traditional technical performance while it neglects certain others (71). As has been previously stated, those judgements involved in measurement are based on some type of standards that reflect what currently constitutes good care. For the purposes of this study, pharmaceutical patient care will be defined as those aspects and functions of pharmaceutical service that are measurable by use of normative standards. The standards chosen are those set forth by the two recognized organizations that deal specifically with pharmaceutical services within hospitals, the Joint Commission on Accreditation of Hospitals, and the American Society of Hospital Pharmacists. Quality will be measured in this study according to compliance with these standards.

Pharmacist Employment. Full-time pharmacist employment will be defined here as a provision of services by one or

more registered pharmacists for a minimum of forty hours per week. Consultant pharmacist employment will be defined as a provision of advisory services by a registered pharmacist.

Resident or Advanced Degree Employment. For the purpose of this study, resident or advanced degree employment will be defined as provision of services on a full-time basis by an individual who has completed a formal residency in hospital pharmacy, or one who holds a graduate degree in this area of study.

Control. As previously stated, a correlation between patient care and organizational goals has been reported by Goss (61). To investigate this hypothesis, all institutions in the sample have been categorized by ownership or control. The four categories used by the American Hospital Association in classifying hospitals in the Guide Issue of Hospitals have been chosen as the reference grouping (72). These include government hospitals, non-government non-profit hospitals, non-government profit-making hospitals and osteopathic institutions.

Pharmacy and Therapeutics Committee. The Pharmacy and Therapeutics Committee is that organizational group within the hospital which serves as a liason between the medical

staff and the pharmacy department. The goal of this committee is the improvement of patient care (73). Its purpose "is to consider all matters related to the handling or use of drugs" in the hospital (74). Some of the specific functions performed by the committee include approval of drugs to be included in the formulary and to be stocked in the hospital, selection of medications for emergency stock on nursing units and establishment of policies governing the safe use of drugs (75).

In this study a measure of stock duplication was chosen as a measure of functional activity of the Pharmacy and Therapeutics Committee. Those committees, meeting four times a year or more were arbitrarily designated as "active".

Advanced Services. The traditional role of the hospital pharmacist is changing rapidly, partly from the increased needs of a growing health care system and partly from pressure within the profession to expand the dimensions of practice. Pharmacy literature is replete with information on a variety of new services being offered by its members.

In response to the realization that drugs must be available at all times, many hospital pharmacies now offer twenty-four hour service (76-77-78).

Medication is being provided to patients by unit dose

drug distribution (79). The primary advantage of this system in reducing medication errors has been well established (80-81), and the effect of the system in reducing clerical time of the nurse has been recognized (82). In addition, the service has been received with enthusiasm by hospital administrators and other members of the health care team (83-84).

With an increased recognition of problems involving contamination and incompatibilities in intravenous solutions, Intravenous Additive Services have been established in many hospital pharmacies (85). The importance of this system has also been acknowledged by the J.C.A.H. (64).

For the purpose of this study, a twenty-four hour pharmacy service, a unit dose drug distribution system and an I.V. additive system are operationally defined as advanced services.

CHAPTER IV

METHODOLOGY

A list of all hospitals in the Houston area was compiled from the 1970 Guide Issue of Hospitals (72) and from the 1970 issue of the Yellow Pages of the Houston Area Telephone Directory (86).

A preliminary survey was conducted by mailing a card and a letter to these hospitals to obtain information regarding employment of pharmacists and activity of the Pharmacy and Therapeutics Committees of the institutions.

(See Appendixes I and II) All hospitals that had not responded after two weeks were contacted by telephone to obtain the necessary data.

An interview schedule (See Appendix IV) was prepared for use in the personal interviews. Its structure was based upon the works of Gibson (56) and of Lazarus (87) and additional questions were prepared by the author. All inquiries investigating either structure or process components of the Donabedian model were based on J.C.A.H. accreditation standards (64) and on A.S.H.P. statements (65). All questions used in the Lazarus survey were included to compare studies conducted in a rural area (11-12) to results of this study

in a metropolis. Questions numbered 2, 4, 5, 6, 9a, 19, 26, 27, 30, 31a, 34, 36, 39, 55, 58, 62, 63, 65 and card number 1, investigated structure.

Questions numbered 3, 7, 9b, 10-18, 20-25, 28, 29, 31b, 33, 37, 38, 40-52, 54, 57, 60, 61, 64 and cards numbered 6 and 14 investigated process. The remaining cards were used to determine duplication scores. The additional questions were utilized to obtain information on employment of a pharmacist who had completed a residency program in the hospital pharmacy or who had completed a graduate degree in this area of study, and to determine utilization of one of the previously defined "advanced services" within the institutions tested.

Forty-five hospitals were included in the survey. Two hospital systems in the population were composed of more than one hospital. Since the hospitals were in different locations with separate personnel for pharmacy service, each was interviewed separately. Two hospitals included in the population were served jointly by one Department of Pharmacy Services. In this case, two separate Pharmacy and Therapeutics Committees were involved and two methods of drug distribution were used. On this basis, it was decided that these organizations would also be tested separately.

Approximately one week prior to the interview, a letter of introduction was mailed to the Chief Pharmacist of each hospital or to the Administrator, if the hospital employed only a consultant pharmacist. (See Appendix III). Appointments were arranged by telephone within five days after receipt of the letter.

All interviews were conducted by the author with the chief pharmacist or the assistant chief pharmacist in those hospitals where one was employed. When only a consultant pharmacist was employed, the interviewee was either the administrator of the hospital or the person in charge of drug distribution. Each question was read aloud and repeated when necessary. Explanations were kept to a minimum.

The structure and process questions were scored by assigning one point each time the institution met the standards of J.C.A.H. and A.S.H.P. The cumulative scores for each hospital were then obtained by totaling the number of points in each category.

Functional scores for the Pharmacy and Therapeutics Committees were obtained on the basis of duplications of stock. One point was assigned each time response to the question indicated that only a single brand of generically equivalent drugs were stocked.

CHAPTER V

RESULTS

DATA

The data collected in this survey will be presented in the following tables. All hospitals were consecutively numbered starting with two hundred twenty-one as a continuation of previous work. Table I reveals the results of the preliminary survey. Thirty-nine hospitals were contacted in the original survey. The number of hospitals interviewed increased to forty-five. One hospital originally classified in the part-time or consultant pharmacist category was re-classified in the full-time pharmacist category as a result of the information obtained in the interview. Tables II through VII reveal the data collected in the personal interviews using the first fifty-nine questions seen in Appendix IV. Tables VIII through XIII disclose all data accumulated from all sixty-six questions shown in Appendix IV.

TABLE I
RESULTS OF PRELIMINARY SURVEY

HOSPITALS WITH A FULL-TIME PHARMACIST	33
HOSPITALS WITH A PART-TIME PHARMACIST OR CONSULTANT PHARMACIST	6

HOSPITALS DISPENSING OUTPATIENT PRE- SCRIPTIONS	28
HOSPITALS NOT DISPENSING OUTPATIENT PRE- SCRIPTIONS	11

HOSPITALS WITH NO PHARMACY AND THERAPEUTICS COMMITTEE	2
HOSPITALS WITH A PHARMACY AND THERAPEUTICS COMMITTEE MEETING FOUR TIMES OR MORE PER YEAR	30
HOSPITALS WITH A PHARMACY AND THERAPEUTICS COMMITTEE MEETING LESS THAN FOUR TIMES PER YEAR	7

TABLE II
STRUCTURE, PROCESS, AND DUPLICATION SCORES

Hospital Number	Structure Scores	Process Score	Duplication Score
221	22	35	0
222	19	39	0
223	11	24	3
224	25	37	1
225	28	48	6
226	20	35	4
227	26	45	3
228	16	42	1
229	8	20	4
230	22	25	0
231	16	38	0
232	27	29	0
233	13	28	2
234	30	49	6
235	19	33	1
236	15	44	0
237	22	51	0
238	19	42	0
239	20	40	5
240	30	46	0
241	15	30	0
242	17	38	1
243	20	40	0
244	19	42	0
245	16	30	1
246	21	31	0
247	23	38	3
248	20	39	0
249	17	45	1
250	16	46	0
251	29	43	0
252	31	54	0
253	19	49	0
254	18	38	0
255	28	42	0
256	14	28	1
257	29	53	0

TABLE II (Continued)

STRUCTURE, PROCESS, AND DUPLICATION SCORES

Hospital Number	Structure Score	Process Score	Duplication Score
258	27	43	3
259	20	28	5
260	16	37	1
261	17	30	1
262	28	46	3
263	28	47	5
264	22	27	0
265	11	34	4

TABLE III
PROCESS SCORES
DICHOTOMIZED AT MEAN - TO DUPLICATION SCORES

ABOVE THE MEAN		BELOW THE MEAN	
Hospital Number	Duplication Score	Hospital Number	Duplication Score
222	0	221	0
225	6	223	3
227	3	224	1
228	1	226	4
234	6	229	4
236	0	230	0
237	0	231	0
238	0	232	0
239	5	233	2
240	0	235	1
243	0	241	0
244	0	242	1
248	0	245	1
249	1	246	0
250	0	247	3
251	0	254	0
252	0	256	1
253	0	260	1
255	0	261	1
257	0	259	5
258	3	264	0
262	3	265	4
263	5		

TABLE IV
STRUCTURE, PROCESS AND DUPLICATION SCORES
BY ACTIVE COMMITTEE ARRANGEMENT

Hospital Number	Structure Score	Process Score	Dupli- cation	Hospital Number	Structure Score	Process Score	Dupli- cation
221	22	35	0	243	20	40	0
222	19	39	0	244	19	42	0
223	11	24	3	245	16	30	1
224	25	37	1	247	23	38	3
225	28	48	6	249	17	45	1
226	20	35	4	250	16	46	0
227	26	45	3	251	29	43	0
228	16	42	1	252	31	54	0
229	8	20	4	253	19	49	0
230	22	25	0	255	28	42	0
232	27	29	0	257	29	53	0
234	30	49	6	258	27	43	3
235	19	33	1	259	20	28	5
236	15	44	0	260	16	37	1
237	22	51	0	261	17	30	1
238	19	42	0	262	28	46	3
239	20	40	5	263	28	47	5
240	30	46	0	264	22	27	0
241	15	30	0				
242	17	38	1				

TABLE V
STRUCTURE, PROCESS, AND DUPLICATION SCORES
BY NO ACTIVE COMMITTEE ARRANGEMENT

Hospital Number	Structure Score	Process Score	Duplication Score
231	16	38	0
233	13	28	2
246	21	31	0
248	20	39	0
254	18	38	0
256	14	28	1
259	20	28	5

TABLE VI
STRUCTURE AND PROCESS SCORES BY PHARMACIST
EMPLOYMENT ARRANGEMENT

FULL TIME PHARMACIST

Hospital Number	Structure Score	Process Score	Hospital Number	Structure Score	Process Score
221	22	35	244	19	42
222	19	39	245	16	30
224	25	37	246	21	31
225	28	48	247	23	48
226	20	35	248	20	39
227	26	45	249	17	45
228	16	42	250	16	46
230	22	25	251	29	43
231	16	38	252	31	54
232	27	29	253	19	49
234	30	49	254	18	38
235	19	33	255	28	42
236	15	44	257	29	53
237	22	51	258	27	43
233	19	42	259	20	28
239	20	40	260	16	37
240	30	46	261	17	30
241	15	30	262	28	46
242	17	38	263	28	47
243	20	40	264	22	27

TABLE VI (Continued)

STRUCTURE AND PROCESS SCORES BY PHARMACIST
EMPLOYMENT ARRANGEMENT

CONSULTANT PHARMACISTS

Hospital Number	Structure Score	Process Score
265	11	34
223	11	24
233	13	28
229	8	20
256	14	28

TABLE VII
STRUCTURE SCORES
DICHOTOMIZED AT MEAN - TO DUPLICATION SCORES

ABOVE THE MEAN		BELOW THE MEAN			
Hospital Number	Duplication Score	Hospital Number	Duplication Score	Hospital Number	Duplication Score
221	0	222	0	243	0
224	1	223	3	244	0
225	6	226	4	245	1
227	3	228	1	248	0
230	0	229	4	249	1
232	0	231	0	250	0
234	6	233	2	253	0
237	0	235	1	254	0
240	0	236	0	256	1
246	0	238	0	259	5
247	3	239	5	260	1
251	0	241	0	261	1
252	0	242	1	265	4
255	0				
257	0				
258	3				
262	3				
263	5				
264	0				

TABLE VIII
STRUCTURE SCORES BY BED CAPACITY ARRANGEMENT

UNDER 100 BEDS		100 TO 399 BEDS		400 BEDS AND OVER	
Hospital Number	Structure Score	Hospital Number	Structure Score	Hospital Number	Structure Score
223	11	228	16	225	30
230	22	224	25	232	28
233	13	226	20	237	22
246	21	227	26	240	30
235	20	229	8	251	30
241	15	231	16	252	32
248	21	236	16	263	28
254	18	242	18		
258	28	247	24		
264	22	249	17		
265	11	253	20		
244	20	256	14		
245	16	250	16		
239	20	259	20		
		261	17		
		262	29		
		260	16		
		238	19		
		221	22		
		222	19		
		243	20		
		255	29		
		234	30		
		257	30		

TABLE IX
PROCESS SCORES BY BED CAPACITY ARRANGEMENT

UNDER 100 BEDS		100 TO 399 BEDS		400 BEDS AND OVER	
Hospital Number	Process Score	Hospital Number	Process Score	Hospital Number	Process Score
223	24	228	42	225	49
230	25	224	37	232	30
233	28	226	37	237	52
246	31	227	47	240	47
235	34	229	20	251	44
241	30	231	39	252	56
248	40	236	44	263	48
254	38	242	38		
258	44	247	39		
264	27	249	45		
265	34	253	49		
244	43	256	28		
245	30	257	55		
239	40	250	46		
		259	28		
		261	30		
		262	48		
		260	38		
		238	43		
		221	35		
		222	40		
		243	40		
		255	43		
		234	51		

TABLE X
STRUCTURE AND PROCESS SCORES
BY CONTROL ARRANGEMENT

NON-GOVERNMENTAL/NON-PROFIT			NON-GOVERNMENTAL/PROFIT		
Hospital Number	Structure Score	Process Score	Hospital Number	Structure Score	Process Score
229	8	20	223	11	24
231	16	39	224	25	37
232	28	30	226	20	37
237	22	52	235	20	34
238	19	43	236	16	44
221	22	35	241	15	30
222	19	40	248	21	40
240	30	47	242	18	38
250	16	46	254	18	38
251	30	44	256	14	28
252	32	56	261	17	30
257	30	55	264	22	27
258	28	44	243	20	40
247	24	39	244	20	43
249	17	45	245	16	30
253	20	49	255	29	43
			260	16	38
			239	20	40
			227	26	47
			246	21	31

TABLE X (Continued)

STRUCTURE AND PROCESS SCORES
BY CONTROL ARRANGEMENT

GOVERNMENTAL			OSTEOPATHIC		
Hospital Number	Structure Score	Process Score	Hospital Number	Structure Score	Process Score
263	28	48	228	16	42
259	20	28	230	22	25
262	29	48	233	13	28
225	30	49	265	11	34
234	30	51			

TABLE XI
STRUCTURE AND PROCESS SCORES
BY PROFIT - NON-PROFIT ARRANGEMENT

PROFIT			NON-PROFIT		
Hospital Number	Structure Score	Process Score	Hospital Number	Structure Score	Process Score
223	11	24	221	22	35
224	25	37	222	19	40
226	20	37	225	30	49
227	26	47	228	16	42
230	22	25	229	8	20
233	13	28	231	16	39
235	20	34	232	28	30
236	16	44	234	30	51
239	20	40	237	22	52
241	15	30	238	19	43
242	18	38	240	30	47
243	20	40	247	24	39
244	20	43	249	17	45
245	16	30	250	16	46
246	21	31	251	30	44
248	21	40	252	32	56
254	18	38	253	20	49
255	29	43	257	30	55
256	14	28	258	28	44

TABLE XI (Continued)

STRUCTURE AND PROCESS SCORES
BY PROFIT - NON-PROFIT ARRANGEMENT

Hospital Number	PROFIT Structure Score	Process Score	Hospital Number	NON-PROFIT Structure Score	Process Score
260	16	38	259	20	28
261	17	30	262	29	48
264	22	27	263	28	48
265	11	34			

TABLE XII

STRUCTURE AND PROCESS SCORES BY ADVANCED DEGREE
OR RESIDENT EMPLOYMENT ARRANGEMENTNON-ADVANCED DEGREE OR RESIDENT EMPLOYMENT
(FULL-TIME B.S. PHARMACY GRADUATE)

Hospital Number	Structure Score	Process Score	Hospital Number	Structure Score	Process Score
228	16	42	231	16	39
232	28	30	237	22	52
238	19	43	221	22	35
222	19	40	240	30	47
250	16	46	239	20	40
258	28	44	247	24	39
249	17	45	253	20	49
259	20	28	224	25	37
230	22	25	246	21	31
226	20	37	235	20	34
227	26	47	241	15	30
236	16	44	248	21	40
242	18	38	264	22	27
254	18	38	244	20	43
261	17	30	255	29	43
243	20	40			
245	16	30			
260	16	33			

TABLE XII (Continued)

STRUCTURE AND PROCESS SCORES BY ADVANCED DEGREE
AND RESIDENT EMPLOYMENT ARRANGEMENT

ADVANCED DEGREE OR RESIDENT EMPLOYMENT

Hospital Number	Structure Score	Process Score
225	30	49
252	32	56
251	30	44
257	30	55
262	29	48
263	28	48
234	30	51

TABLE XIII

STRUCTURE AND PROCESS SCORES BY ADVANCED
AND NON-ADVANCED SERVICE ARRANGEMENT

NON-ADVANCED SERVICE ARRANGEMENT

Hospital Number	Structure Score	Process Score	Hospital Number	Structure Score	Process Score
228	16	42	231	16	39
232	28	30	237	22	52
238	19	43	221	22	35
222	19	40	254	18	38
250	16	46	256	14	28
258	28	44	247	24	39
249	17	45	253	20	49
259	20	28	230	22	25
233	13	28	265	11	34
224	25	37	229	8	20
226	20	37	246	21	31
227	26	47	235	20	34
236	16	44	241	15	30
242	18	38	248	21	40
261	17	30	264	22	27
243	20	40	244	20	43
245	16	30	255	29	43
260	16	38	263	28	48
234	30	51	239	20	40
223	11	24			

TABLE XIII (Continued)

STRUCTURE AND PROCESS SCORES BY ADVANCED
AND NON-ADVANCED SERVICE ARRANGEMENT

ADVANCED SERVICE ARRANGEMENT

Hospital Number	Structure Score	Process Score
225	30	49
252	32	56
251	30	44
257	30	55
262	29	48
240	30	47

ANALYSIS

The analysis of this data will be divided in twelve parts to treat the relationships between various components of pharmaceutical patient care and to compare these variables to a number of factors that might contribute toward the quality of care.

RELATIONSHIP BETWEEN STRUCTURE AND PROCESS

The strength of the relationship between structure and process was tested with the Pearson product-moment correlation coefficient. This coefficient is $r = 0.60$ and is significant beyond the 0.05 level (critical value, $r = 0.29$, $df = 43$).

It is possible to determine the functional relationships between the process scores and the structure scores using the linear equation model:

$$Y' = a + bX$$

where

Y' = the predicted process score

a = the Y intercept

b = the slope of the prediction line

x = the known structure score

we find:

$$Y' = 20.75 + .86 (X)$$

The Standard Error of Estimate for this prediction is 6.79. This is the functional relationship between the two components, structure and process, of pharmaceutical patient care.

RELATIONSHIP BETWEEN COMPONENTS OF PROCESS

The strength of the relationship between process scores and duplication scores was tested by the use of a point-biserial correlation coefficient. To do so, hospitals were categorized into two groups dichotomized at the mean of their process scores.

The point-biserial was calculated from the data in Table III and found to be $r_{pb} = 0.01$ and was not significant at the 5% level (calculated $t = 0.07$; critical value, $t_{.05 (43)} = 2.02$).

Two other components of process were tested for correlation. These were number of meetings held annually by the Pharmacy and Therapeutics Committee and the functional activity of the Committee as measured by its duplication score. Hospitals were divided into two groups of "active Committee" and "non-active Committee" as previously defined.

The point-biserial correlation coefficient calculated was $r_{pb} = 0.07$ and was not significant at the 5% level

(calculated $t = 0.46$; critical value, $t_{.05} (43) = 2.02$).

The relationship between the activity of the Pharmacy and Therapeutics Committee and the process scores was tested by categorizing the hospitals into two groups dichotomized by "active" and "non-active" Committees. The point-biserial correlation coefficient calculated was $r_{pb} = 0.28$ and was not significant at the 5% level (calculated $t = 1.91$; critical value, $t_{.05} (43) = 2.02$).

RELATIONSHIP BETWEEN COMPONENTS OF STRUCTURE

The pharmacist is considered one of the structural components of pharmaceutical patient care. To test the significance of a full-time versus a consultant pharmacist, the hospitals were categorized into two groups by pharmacist employment arrangement and their structure scores were compared.

The point-biserial correlation coefficient calculated was $r_{pb} = 0.57$ and was significant beyond the 5% level (calculated $t = 4.55$; critical value, $t_{.05} (43) = 2.02$).

RELATIONSHIP BETWEEN STRUCTURE AND COMPONENTS OF PROCESS

To test the structure and components of process, the hospitals were first dichotomized into two groups according to "active" and "non-active" Pharmacy and Therapeutics Committees and their structure scores were compared. The

point-biserial correlation coefficient calculated was $r_{pb} = 0.26$ and was not significant to the 5% level (calculated $t = 1.77$; critical value, $t_{.05} (43) = 2.02$).

The hospitals were then classified into two groups dichotomized at the mean of the structure scores, and their duplication scores, as a component of process, were compared. The point-biserial coefficient calculated was $r_{pb} = 0.06$ and was not significant at the 5% level (calculated $t = 0.39$; critical value, $t_{.05} (43) = 2.02$).

Finally the hospitals were categorized into groups, those employing full-time versus consultant pharmacists, and their process scores were compared. The point-biserial correlation coefficient calculated was $r_{pb} = 0.50$ and was significant beyond the 5% level (calculated $t = 3.79$; critical value, $t_{.05} (43) = 2.02$).

RELATIONSHIPS BETWEEN BED CAPACITY AND STRUCTURE

The hospitals were classified into three groups according to bed capacity, those having under 100 beds, those having 100 beds to 399 beds and those having 400 beds and over.

The point-biserial technique was applied by comparing the structure scores of hospitals under 100 beds to the scores of hospitals having 100 beds to 399 beds. The correlation

coefficient calculated was $r_{pb} = 0.17$ and was not significant to the 5% level (calculated $t = 1.04$; critical value, $t_{.05 (36)} = 2.02$).

The point-biserial technique was applied by comparing the structure scores of hospitals having 100 beds to 399 beds to the scores of those with 400 beds and over. The correlation coefficient calculated was $r_{pb} = 0.56$ and was significant beyond the 5% level (calculated $t = 3.64$; critical value, $t_{.05 (29)} = 2.05$).

The point-biserial technique was applied by comparing the structure scores of hospitals under 100 beds to the scores of hospitals having 400 beds and over. The correlation coefficient calculated was $r_{pb} = 0.74$ and was significant beyond the 5% level (calculated $t = 4.80$; critical value, $t_{.05 (19)} = 2.09$).

RELATIONSHIPS BETWEEN BED CAPACITY AND PROCESS

The point-biserial technique was applied by comparing the process scores of hospitals under 100 beds to the scores of hospitals having 100 beds to 399 beds. The correlation coefficient calculated was $r_{pb} = 0.39$ and was significant beyond the 5% level (calculated $t = 2.54$; critical value, $t_{.05 (36)} = 2.02$).

The point-biserial technique was applied by comparing the

process scores of hospitals having 100 beds to 399 beds to the scores of those with 400 beds and over. The correlation coefficient calculated was $r_{pb} = 0.32$ and was not significant to the 5% level (calculated $t = 1.82$; critical value, $t_{.05 (29)} = 2.05$).

The point-biserial technique was applied by comparing the process scores of hospitals having under 100 beds to the scores of those with 400 beds and over. The correlation coefficient calculated was $r_{pb} = 0.66$ and was significant beyond the 5% level (calculated $t = 3.83$; critical value, $t_{.05 (19)} = 2.09$).

RELATIONSHIP BETWEEN CONTROL AND STRUCTURE SCORES

The hospitals were classified into four groups according to control or ownership; governmental, non-governmental non-profit, non-governmental profit and osteopathic. Because only four hospitals fell into the category of osteopathic this group was not included in the analysis.

The point-biserial technique was applied by comparing the structure scores of governmental hospitals to scores of non-governmental non-profit hospitals. The correlation coefficient calculated was $r_{pb} = 0.32$ and was not significant to the 5% level (calculated $t = 1.47$; critical value, $t_{.05 (19)} = 2.09$).

The point-biserial technique was applied by comparing the structure scores of governmental hospitals to the scores of non-governmental profit-making hospitals. The correlation coefficient calculated was $r_{pb} = 0.61$ significant beyond the 5% level (calculated $t = 3.69$; critical value, $t_{.05} (23) = 2.07$).

The point-biserial technique was applied by comparing the structure scores of non-governmental non-profit hospitals to the scores of non-governmental profit-making hospitals. The correlation coefficient calculated was $r_{pb} = 0.29$ and was not significant to the 5% level (calculated $t = 1.77$; critical value, $t_{.05} (34) = 2.03$).

RELATIONSHIPS BETWEEN CONTROL AND PROCESS SCORES

The point-biserial technique was applied by comparing the process scores of governmental hospitals to the scores of non-governmental non-profit hospitals. The correlation coefficient calculated was $r_{pb} = 0.10$ and was not significant to the 5% level (calculated $t = 0.44$; critical value, $t_{.05} (19) = 2.09$).

The point-biserial technique was applied by comparing the process scores of governmental hospitals to the scores of non-governmental profit hospitals. The correlation coefficient calculated was $r_{pb} = 0.46$ and was significant beyond

the 5% level (calculated $t = 2.48$; critical value, $t_{.05 (23)} = 2.07$).

The point-biserial technique was applied by comparing the process scores of non-governmental non-profit hospitals to the scores of non-governmental profit hospitals. The correlation coefficient calculated was $r_{pb} = 0.40$ and was significant beyond the 5% level (calculated $t = 2.54$; critical value, $t_{.05 (34)} = 2.03$).

RELATIONSHIPS BETWEEN THE PROFIT MOTIVE AND STRUCTURE SCORES

The hospitals were dichotomized into two categories according to the profit and non-profit arrangement and their structure scores were compared by the point-biserial correlation test. The coefficient so calculated was $r_{pb} = 0.38$ and was significant beyond the 5% level (calculated $t = 2.69$; critical value, $t_{.05 (43)} = 2.02$).

RELATIONSHIP BETWEEN THE PROFIT MOTIVE AND PROCESS SCORES

The point-biserial correlation test was applied to the same two categories of hospitals and their process scores were compared. The coefficient so calculated was $r_{pb} = 0.47$ and was significant beyond the 5% level (calculated $t = 3.47$; critical value, $t_{.05 (43)} = 2.02$).

RELATIONSHIP BETWEEN DEGREE OF TRAINING AND STRUCTURE SCORES

The point-biserial technique was applied using hospitals with and without "advanced degree or resident employment" as dichotomous variable and structure scores as the continuous variable. The correlation coefficient calculated was $r_{pb} = 0.68$ and was significant beyond the 5% level (calculated $t = 5.72$; critical value, $t_{.05 (38)} = 2.02$).

RELATIONSHIP BETWEEN DEGREE OF TRAINING AND PROCESS SCORES

The point-biserial technique was applied using hospitals with and without "advanced degree or resident employment" as the dichotomous variable and process scores as the continuous variable. The correlation coefficient calculated was $r_{pb} = 0.57$ and was significant beyond the 5% level (calculated $t = 4.28$; critical value, $t_{.05 (38)} = 2.02$).

RELATIONSHIPS BETWEEN SERVICES PROVIDED AND STRUCTURE SCORES

The point-biserial technique was applied using hospitals with and without "advanced service" as the dichotomous variable and structure scores as the continuous variable. The correlation coefficient calculated was $r_{pb} = 0.60$ and was significant beyond the 5% level (calculated $t = 4.90$; critical value, $t_{.05 (43)} = 2.02$).

RELATIONSHIPS BETWEEN SERVICES PROVIDED AND PROCESS SCORES

The point-biserial technique was applied using hospitals with and without "advanced service" as the dichotomous variable and process scores as the continuous variable.

The correlation coefficient calculated was $r_{pb} = 0.49$ and was significant beyond the 5% level (calculated $t = 3.69$; critical value, $t_{.05 (43)} = 2.02$).

CHAPTER VI

DISCUSSION OF RESULTS

This study was designed to measure the structure and process components of pharmaceutical care within the hospitals of the survey. It was also intended to investigate the relationships existing between them and several factors which might contribute toward the quality of care. It was designed to compare the results of this survey in a metropolis to similar surveys in rural areas (11-12). A list of hospitals to be included in the survey was compiled from the 1970 Guide Issue of Hospitals (72) and from the 1970 Houston Area Telephone Directory (86). A representative of each hospital was then personally interviewed to obtain composite scores for structure and process variables of pharmaceutical patient care in the institutions tested. The data and analyses have been presented.

It can be concluded from this study that a positive correlation exists between the structure and process elements of pharmaceutical patient care in the hospitals of Houston. It was found that this relationship is a linear functional one.

Although establishment of a formulary system is considered one of the duties of the Pharmacy and Therapeutics Committee, the results of this survey indicate that this is not the case in the population tested. Duplication scores were not significantly correlated with the number of meetings of this committee, indicating that a measure of stock duplication was not an acceptable measure of functional activity of the Pharmacy and Therapeutics Committees in these hospitals. Duplication scores were also not correlated with either structure or process scores. In view of previous research (11-12) none of these were unexpected findings.

Neither process scores nor structure scores were found to be significantly affected by the number of Pharmacy and Therapeutics Committee meetings held annually. These findings are not in agreement with previous research (11-12). This indicates that some variation may exist in the relative influence of Pharmacy and Therapeutics Committees in rural areas in contrast to metropolitan areas. The structure and the process variables are apparently being influenced by some other force in the hospitals of this study. The lack of correlation with P. and T. activity may also reflect an inadequacy in the definition of the terms active and inactive. The true degree of activity may be hidden by utilizing such a broad scale in categorizing the Committees. It is also

possible that activity cannot be judged only in terms of number of annual meetings. Perhaps, in establishing definitions for activity, attention should be given to attendance and participation of committee members and relevance of the agenda.

Both structure and process scores were significantly higher in institutions employing a full time pharmacist. This supports the popular belief that employment of a pharmacist will increase the quality of pharmacy services rendered.

The results of this study also indicate that hospitals of different sizes provide a different quality of pharmacy service to their patients. The structural components of pharmaceutical patient care provided in hospitals of 400 beds and over are significantly higher than in smaller hospitals. The performance of individuals involved in the delivery of this care is significantly higher in hospitals with 100 beds and over than in hospitals under 100 beds.

The correlation of organizational goals with quality of care in the area of pharmacy services was established by this research. Both structure and process scores were found to be significantly higher in non-profit than in profit-making institutions. This reflects an increased availability of facilities and equipment in these hospitals as well as a

higher level of performance on the part of the individuals involved in this work. Both concepts seem to reflect a higher degree of concern for patient welfare in non-profit hospitals.

In exploring the relationships between control or ownership of hospitals and the quality of services rendered, it was found that structural components of care are significantly higher in the government owned hospitals than in the non-government profit-making institutions. No significant difference was found in the facilities and equipment available in non-government non-profit hospitals when compared to government owned and non-government profit-making institutions.

The process variables were found to be significantly higher both in government owned institutions and in non-government non-profit hospitals than in non-government profit-making hospitals. No significant variation was found in the level of performance by those individuals employed in government hospitals and non-government, non-profit hospitals. This data supports the correlation between organizational goals and the quality of care rendered.

Both structure and process scores were found to be significantly higher in hospitals employing individuals who have completed a Master's Degree or a residency in hospital pharmacy. It is important to note here that no additional

credit was given to these hospitals solely on the basis of increased qualifications of personnel. Analysis of the data indicate that hospital employment of individuals with advanced education and training in this pharmacy sub-specialty may result in a significant increase in quality of pharmaceutical patient care in those institutions.

Both structure and process scores were found to be significantly higher in hospitals utilizing at least one defined "advanced service". If one considers these services as goals for more progressive institutions, the results of this data are compatible with the correlation between organizational goals and quality of care. Utilization of any of these services represents increased concern for patient welfare. It also shows an increased willingness on the part of administration to make financial investments necessary to support this concern. The results of this survey substantiate these ideas.

The information revealed by this survey does not indicate cause and effect relationships, only a correlation between quality of care and a number of factors that might influence this quality. Data for this work was collected in hospitals of one metropolitan area and can only be strictly applied to the hospitals of that population. It is felt, however, that these conclusions can be broadly interpreted to describe hospitals of other metropolitan areas. The

relationship between the structure and process components of the Donabedian model established in rural hospitals has been corroborated in this metropolitan area. It is felt that this relationship can be liberally extended to describe situations existing throughout the country.

Primarily because of third party involvement in medical care delivery, there is a growing need to develop accurate and inexpensive means for measuring quality. In defining the relationship between the structure and process components of the Donabedian model, we have made a significant stride in accomplishing this goal. It is now important to elucidate the relationships between these components and outcome.

Although pharmacists are continuing their efforts to expand their roles in patient care, they have devoted little scientific research to measuring the effects of these changes on the patient. The Donabedian model provides an outline for research design to measure performance and outcome that results from any of the new pharmaceutical patient care systems that are being developed.

An accurate evaluation of the advantages that can be derived from such innovations would be an invaluable tool in weighing the relative importance of any difficulties that may also be encountered.

It is apparent that improvement of patient care is the principal goal of every professional in the health care delivery system. Probably the primary importance of continuing research in the measurement of quality is that it will provide an effective method for guiding us to the attainment of this goal.

CHAPTER VII

SUMMARY

A study investigating the structure and process components of quality of pharmaceutical patient care was conducted in the hospitals of Houston. The following information for the institutions of the population was revealed:

1. A positive correlation was found between the process and structure components. This relationship is a linear functional one.
2. No correlation was found between the activity of the Pharmacy and Therapeutics Committees and either process or structure scores.
3. Hospitals employing full-time pharmacists have significantly higher components of structure and of process than those employing only consultant pharmacists.
4. Hospitals of 400 beds and over have significantly higher structural components than smaller hospitals.
5. Hospitals of 100 beds and over have significantly higher process components than smaller hospitals.
6. Non-profit institutions have significantly higher components of structure and process than profit-

making institutions.

7. Government owned hospitals have significantly higher components of structure than non-government profit-making institutions. No significant difference was found in the structure of non-government non-profit hospitals and either government owned or non-government profit-making institutions.
8. Both government owned hospitals and non-government non-profit hospitals have significantly higher components of process than non-government profit-making institutions. No significant difference was found in the process variables in government owned and non-government non-profit hospitals.
9. Both structure and process scores were significantly higher in hospitals employing individuals who have completed a Master's Degree or a residency in hospital pharmacy than in those employing full-time Bachelor of Science pharmacy graduates.
10. Both structure and process scores were found to be significantly higher in hospitals utilizing at least one defined "advanced pharmaceutical service".

BIBLIOGRAPHY

1. Peterson, Osler L., "Medical Care: Its Social and Organizational Aspects," New England Journal of Medicine, 269:1238 (December 5) 1963.
2. Cumming, Gordon R., "Annual Administrative Reviews - Legislation," Hospitals, 43:125 (April 1) 1969.
3. Williams, K. J., "Annual Administrative Reviews - Medical Care Appraisal," Hospitals, 40:105 (April 1) 1966.
4. Daiger, Stephen, "Peer Review: Cost Control or Quality Control?," California Medicine, 113:75 (December) 1970.
5. Myers, Robert and Slee, Vergie, "Basic Ingredients of a Medical Audit," Modern Hospital, 86:62 (April) 1956.
6. Riessler, Lawrence T., "Evaluating the Medical Audit in a Community Hospital," Hospital Topics, 48:27 (September) 1970.
7. Landdeck, John R., "Efficiency and Quality of Patient Care," Hospitals, 44:41 (September 16) 1970.
8. Bianco, Emidio, "The Medical Audit: Powerful Tool for Upgrading Care," Hospital Progress, 51:72 (July) 1970.
9. Noland, Royce P., "Components of Quality Health Care," Physical Therapy, 50:34 (January) 1970.
10. Donabedian, Avedis, "Evaluating the Quality of Medical Care," Health Services Research, (New York: The Milbank Memorial Fund, 1967) page 169.
11. Lazarus, Herman Lee, A Quantification of Quality of Pharmaceutical Patient Care in Mississippi Hospitals Under One Hundred Beds, Masters Thesis, University of Mississippi, 1970, pages 41-43.
12. Brown, Thomas R., A Quantification of Quality of Pharmaceutical Patient Care In Mississippi Hospitals Having One Hundred or More Beds, Masters Thesis, University of Mississippi, 1971, pages 31-32.

13. Makover, H. B., "The Quality of Medical Care: Methodological Survey of Medical Groups Associated with the Health Insurance Plan of Greater New York," American Journal of Public Health, 41:824 (July) 1951.
14. Howland, Daniel and McDowell, Wanda E., "The Measurement of Patient Care: A Conceptual Framework," Nursing Research, 13:4 (Winter) 1964.
15. Donabedian, op. cit., page 166.
16. Ibid., page 167.
17. Sheps, Mindel C., "Approaches to the Quality of Hospital Care," Public Health Reports, 70:877 (September) 1955.
18. Donabedian, op. cit., page 186.
19. Ibid., page 183.
20. Ibid., page 177.
21. DeGayndt, Willy, "Five Approaches for Assessing the Quality of Care," Hospital Administration, 15:21 (Winter) 1970.
22. Peterson, Osler L., et al., "An Analytical Study of North Carolina General Practice: 1953-1954," The Journal of Medical Education, 31:1, Part II (December) 1956.
23. Stapleton, John F. And Zwerheman, James A., "The Influence of an Intern-Resident Staff on the Quality of Private Patient Care," Journal of the American Medical Association, 194:135 (November 22) 1965.
24. Brooke, Ronald, "An Audit of the Quality of Care of Social Medicine," Milbank Memorial Fund Quarterly, 46:351 (July) 1968.
25. Pearce, K. I. "A Comparison of Care Given by Family Practitioners and Psychiatrists in the Teaching Hospital Psychiatric Unit," American Journal of Psychiatry, 127:135 (December) 1970.
26. Sparling, J. Frederick, "Measuring Medical Care Quality: Comparative Study, Part II," Hospitals, 36:51 (April 1) 1962.

27. Myers, Robert S., "The Audit Makes Evaluation Meaningful," Modern Hospital 86:96 (July) 1956.
28. Kolisch, Paul deR., "Evaluating Medical Care," Hospitals, 37:80 (February 16) 1963.
29. Chase, John D., "Quality of Patient Care," Military Medicine, 135:916 (October) 1970.
30. Smith, David and Metzner, Charles, "Differential Perceptions of Health Care Quality in a Prepaid Group Practice," Medical Care, 8:264 (July-August) 1970.
31. Sanazaro, Paul J. and Slosberg, Bernard, "Annual Administrative Reviews--Patient Care Evaluation," Hospitals, 45:131 (April) 1971.
32. Sanazaro, Paul J. and Williamson, John W., "Physician Performance and Its Effects on Patients: A Classification Based on Reports by Internists, Surgeons, Pediatricians and Obstetricians," Medical Care, 8:131 (July-August) 1970.
33. Morehead, Mildred A., "Evaluating Quality of Medical Care in the Neighborhood Health Center Program of the Office of Economic Opportunity," Medical Care, 8:118 (March-April) 1970.
34. Kolisch, Paul deR., "Quality of Care: You Can't Check It with Charts!," Medical Economics, 41:80 (October 19) 1964.
35. Donabedian, Avedis, "Some Issues in Evaluating the Quality of Nursing Care," American Journal of Public Health, 59:1833 (October) 1969.
36. Gonnella, Joseph A., Goran, Michael J., Williamson, John W., and Cotsonas, Nicholas J., "Evaluation of Patient Care: An Approach," Journal of the American Medical Association, 214:2040 (December 14) 1970.
37. Johnson, Walter and Rosenfeld, Leonard, "Indices of Performance in Ambulatory Care Services," Medical Care, 7:250 (May-June) 1969.

38. Phaneuf, Maria C., "Quality of Care: Problems of Measurement, Part I," American Journal of Public Health, 59:1827 (October) 1969.
39. Denton, John C., Ford, Amasa B., Liske, Ralph E., and Ort, Robert S., "Predicting Judged Quality of Patient Care in General Hospitals," Health Services Research, 2:26 (Spring) 1967.
40. Shapiro, Sam, "End Result Measurements of Quality of Medical Care," Milbank Memorial Fund Quarterly, 45:7 (April) 1967.
41. Sparling, J. Frederick, "Measuring Medical Care Quality: Comparative Study, Part I," Hospitals, 36:62 (March 16) 1962.
42. Ellwood, Paul M., "Quantitative Measurements of Patient Care Quality, Part II," Hospitals, 40:42 (December 16) 1966.
43. Sidel, Victor W., "Quantifying Quality," Hospital Practice, 2:9 (April) 1967.
44. Leonard, Robert C., Skipper, James K., and Wooldridge, Powhatan J., "Small Field Experiments for Evaluating Patient Care," Health Services Research, 2:46 (Spring) 1967.
45. Ellwood, Paul M., "Quantitative Measurements of Patient Care Quality, Part I," Hospitals, 40:59 (December 16) 1966.
46. Wallace, Helen M., "How to Evaluate the Services and Care Offered Handicapped Children," Public Health Report, 85:647 (July) 1970.
47. Archambault, George F., "Evaluation of a Pharmacy Service in Hospitals," American Journal of Hospital Pharmacy, 16:390 (August) 1959.
48. Derewicz, Henry J., "An Audit of Pharmaceutical Services-- A New Committee Begins," Drug Intelligence, 2:258 (October) 1968.
49. Francke, Don E., Latiolais, Clifton J., Francke, Gloria N., and Ho Norman F. H., Mirror to Hospital Pharmacy, (Easton, Pennsylvania: Mack Printing Company, 1964) pages 199-215.

50. Gautreaux, Ronald and Watkins, C. Eugene, "A Survey of Narcotic Control in Hospitals," American Journal of Hospital Pharmacy, 24:566 (October) 1967.
51. Smith, Mickey C., and Hopper, Columbus B., "Pharmacy Services in Hospitals under 100 Beds," Southern Hospitals, 37:13 (May) 1968.
52. Burkholder, David F., "Monitoring Drug Usage Data," Drug Intelligence, 1:87 (March) 1967.
53. Burkholder, David F., "Drugs Selected by Pharmacy and Therapeutics Committees of Teaching Hospitals," Drug Intelligence, 1:329 (October) 1967.
54. Alexander, W. E., Humechuk, R. J., and Keeping, D., "A Drug Usage Study, Part I," Drug Intelligence, 3:6 (January) 1969.
55. Alexander, W. E., Humechuk, R. J. and Keeping, D., "A Drug Usage Study, Part II," Drug Intelligence, 3:304 (November) 1969.
56. Gibson, J. Tyrone, Sumner, Edward D., and Kotzan, Jeffrey A., "The Quality of Pharmacy Services within the Student Health Services of the University System of Georgia," American Journal of Hospital Pharmacy, 28:37 (January) 1971.
57. Lazarus, op. cit., page 37.
58. Brown, op. cit., page 33.
59. Lazarus, op. cit., page 14.
60. Ibid., page 42.
61. Goss, Mary E., "Organizational Goals and Quality of Medical Care: Evidence from Comparative Research on Hospitals," Journal of Health and Social Behavior, 11:255 (December) 1970.
62. Donabedian, Avedis, "Annual Administrative Reviews-- Patient Care Evaluation," Hospitals, 44:131 (April 1) 1970.

63. Barker, Kenneth, et al., The Demonstration and Evaluation of an Experimental Medication System for the U.A.M.C. Hospital, Volume I, (Fayetteville: Department of Editorial Services, University of Arkansas, 1967) pages 221-257.
64. Joint Commission on Accreditation of Hospitals, Standards for Hospital Accreditation, (December) 1970.
65. American Society of Hospital Pharmacists, "Guidelines Relative to the Safe Use of Medications In Hospitals," American Journal of Hospital Pharmacy, 19:577 (November) 1962.
66. Lazarus, op. cit., page 41.
67. Brown, op. cit., page 31.
68. Donabedian, Avedis, "Evaluating the Quality of Medical Care," Health Services Research, (New York: The Milbank Memorial Fund, 1967) page 188.
69. Ibid., page 15.
70. Donabedian, Avedis, A Guide to Medical Care Administration, Volume II: Medical Care Appraisal, (New York, New York: American Public Health Association, Inc., 1968) page 7.
71. Ibid, page 9.
72. Guide Issue, Part 2, Hospitals, 44:210 (August 1) 1970.
73. Katcher, Avram Labe, "Appraising Purposes and Functions of the P. and T. Committee," Hospital Topics, 47:61 (February) 1969.
74. Francke, Don E., et al., op. cit., page 140.
75. Ibid., page 144.
76. Speakman, Eugene and Carpenter, Douglas C., Jr., "We Threw Away the Key to the Pharmacy," Hospital Management, 104:25 (December) 1967.
77. Bowles, Grover, "Good Patient Care Requires 24 Hour Pharmacy Service," Modern Hospital, 110:118 (January) 1968.

78. Brooke, Robert, "Round-the-Clock Pharmacy Service," Hospital Topics, 47:74 (March) 1969.
79. McClain, Percy R. and Ravin, Robert L., "The Status of Unit Dose Dispensing in the United States Hospitals: 1969," American Journal of Hospital Pharmacy, 27:994 (December) 1970.
80. Barker, Kenneth N., "The Effects of an Experimental Medication System on Errors and Costs, Part I," American Journal of Hospital Pharmacy, 26:324 (June) 1969.
81. Hynniman, Clifford E., et al., "Comparison of Medication Errors Under the University of Kentucky Unit Dose System and Traditional Drug Distribution Systems in Four Hospitals," American Journal of Hospital Pharmacy, 27:802 (October) 1970.
82. Slater, Wallace E., and Hripko, Joseph R., "The Unit Dose System in a Private Hospital, Part II," American Journal of Hospital Pharmacy, 27:994 (December) 1970.
83. Moody, Philip M., et al., "Attitudes of Hospital Personnel Toward Unit Dose at the University of Kentucky Hospital," American Journal of Hospital Pharmacy, 27:473 (June) 1970.
84. Beste, Donald F., "An Integrated Pharmacist-Nurse Approach to the Unit-Dose Concept," American Journal of Hospital Pharmacy, 25:396 (August) 1968.
85. Ravin, Robert L., "The Reasons to Begin," Handbook of I.V. Additive Reviews, 1970 (Cincinnati, Ohio: University of Cincinnati, 1970) page 1.
86. Southwestern Bell, Greater Houston Yellow Pages, 1970, page 612.
87. Lazarus, op. cit., pages 58-63.

APPENDIX I

Letter to each hospital pharmacist or administrator accompanying the preliminary survey card.

Dear _____:

The increasing importance of institutionalized pharmacy in the drug delivery system is readily apparent to those of us involved in academic practice.

We are anxious to update our programs to meet the needs of our future hospital pharmacists.

Will you take a minute of your time to complete the enclosed post card so that we may have a more current picture of hospital pharmacy in the city of Houston?

Your assistance will be sincerely appreciated.

Sincerely yours,

Dewey D. Garner, Ph.D.
Assistant Professor
Pharmacy Administration

Enclosure: Post Card

P.S. This survey has the approval of the Harris County
Hospital Association.

APPENDIX II

Preliminary questionnaire card mailed to each hospital in the Houston Metropolitan area.

1. How many pharmacists are employed in your hospital?

Full-time_____ Part-time_____

If part-time, how many hours per week?_____

- Yes No 2. If no pharmacists are employed, do you employ the services of a consultant pharmacist?

If yes, how many hours weekly does he spend in your hospital?

- Yes No 3. Is there a Pharmacy and Therapeutics Committee in your hospital?

How many P & T meetings were held last year?_____

How many meetings will be held this year?

- Yes No 4. Do you dispense medications to Outpatients?

5. Please list below the names of the members of your Pharmacy and Therapeutics Committee.

APPENDIX III

Letter to each interviewee to request participation in the survey.

Dear _____:

In October last year, you were kind enough to furnish us with the information necessary to update our files and allow us to begin our research in hospital pharmacy that now is in the final stages.

Once again, we are in need of your assistance in this project. A final survey is being made of Houston hospitals. Our need now is to talk personally with you. We would like to come to your hospital during the week of _____, 1971.

We feel that we will need less than one hour of your time. We are aware that this is a lot to ask but hope that you will be willing to help us in our efforts to provide needed information to hospital administration and pharmacists throughout Texas.

My research assistant, Miss Ann Guenther will call you shortly to discuss an appointment which is convenient to you. Again, thank you for your continued cooperation and interest.

Sincerely yours,

Dewey D. Garner, Ph.D.
Assistant Professor
Pharmacy Administration

DDG:rjw

P.S. This research project has the approval of the Texas Hospital Association.

APPENDIX IV

Final questionnaire used in the personal interview with each hospital pharmacist or administrator. Cards shown at the end of this appendix were handed to the interviewee for him to check during the interview.

Yes No Directions: Ask each question in the same manner.
 Read the question as it is stated on the questionnaire.
 Do not elaborate. If clarification is necessary, do
 so but in as few words as possible.

1. Name of the hospital _____
 Number of beds _____. Arrangement for pharmacist:
 full-time _____, part-time _____,
 consultant _____. How many hours does the
 pharmacist spend in your facility each week _____
 How many times each week does the pharmacist visit
 your hospital _____.

____ _ 2. Are separate locked storage areas provided for
 disinfectants and drugs intended for external use?

____ _ 3. Are drugs within the pharmacy and throughout the
 hospital inspected at least once monthly by the person
 in charge of drugs?

____ _ 4. Are there locked drug storage areas on nursing
 units?

____ _ 5. Is double-locked storage provided for narcotics
 on each nursing station where drugs are kept?

____ _ 6. Are nursing stations provided with a separate
 medication preparation area?

____ _ 7. Are periodic inspections of nursing stations
 medication centers performed to ensure:

____ _ a. that medications for external use are kept apart
 from internal and injectable medications?

____ _ b. that special storage is provided for biologicals
 and other relatively unstable products?

____ _ c. that there are no out-dated or deteriorated
 medications?

____ _ d. that there is an adequate supply of emergency
 drugs?

____ _ e. that there is posted on the nursing units a
 conversion chart for each change from the metric
 to the apothecary system?

8. Card #1

9. Ask the person being interviewed to:
Name the Poison Control Center in his area
Show you where the telephone number for the center is posted.
10. Does your facility have a defined procedure for returning drugs recalled by their supplier or manufacturer?
11. Please give the TITLE of the person responsible for handling the recall of drugs. _____
12. Has your facility ever returned drugs that have been recalled by their supplier?
13. Is there a policy that drugs be administered only on the written order of a physician?
14. Are investigational drugs used at this facility?
- If yes, is there written provision for the handling of investigational drugs?
15. Does your facility have a written policy for reporting adverse drug reactions?
16. Does your facility have a written policy for reporting medication errors?
17. Do you report medication errors to the Administrator?
18. Labels for nursing station medication containers indicate which of the following:
- _____ name of the medication
 - _____ name of the hospital
 - _____ strength of the drug
 - _____ lot or control number
 - _____ date of issue
 - _____ directions for use
 - _____ other information
19. Are labels on nursing stations medication containers machine typed?
20. Do detail men regularly visit your facility?
If so, do they visit the pharmacy or drug room? _____

- ___ 21. Has the person in charge of the pharmacy or
___ drug room ever arranged an exhibit relating to drugs
in this facility?
- ___ 22. Are in-service training programs sponsored by the
___ pharmacy personnel? If yes, give the subject covered
by the programs _____
- ___ 23. On the outpatient prescription order itself, is
___ the source and lot number of the drug recorded?
- ___ 24. Is a standard list of abbreviations and symbols
___ used for the writing of medication orders?
- ___ 25. Are medication cards used for the preparation
___ and administration of most medications?
- ___ 26. Is the person responsible for pharmaceutical
___ services a member of the following:
___ American Pharmaceutical Association
___ American Society of Hospital Pharmacists
___ Texas Pharmaceutical Association
___ Any drug information service
- ___ 27. The pharmaceutical or drug service within your
___ facility is under direct supervision of (give the
TITLE of the person): _____
(M.D., R.Ph., R.N., etc.)
- ___ 28. Are vaccines refrigerated?
- ___ 29. Are thermometers kept in refrigerators so that
___ the temperature inside the refrigerator can be readily
determined?
- ___ 30. Check the following that your medication refri-
___ gerators are equipped with:
___ biological drawer inserts
___ deep freeze or ice cube unit
___ automatic defrosting equipment
___ circulation fan
- ___ 31. Do you dispense medications to outpatients?
___ If yes, do you feel that your record of drugs and
___ medications dispensed to outpatients are readily
available and sufficient?
32. Card #2

- — 33. When a person fills a narcotic prescription or order, does he write his full signature across the face of the prescription?
- — 34. What equipment is available within the pharmacy or drug room for the compounding and dispensing of pharmaceutical and parenteral preparations?
-
35. Cards #3, #4, #5, #6, #7.
- — 36. Give the TITLE of the person(s) responsible for adding substances to intravenous solutions:
-
- — 37. If drugs are added to I.V. solutions, is a supplementary label attached to the parenteral solutions container?
38. Does the I.V. label contain the indicated information:
- — name of drug added
- — amount of drug added
- — date drug was added
- — time drug was added
- — name or initials of person adding the drug(s)
- — 39. Are WRITTEN specifications established for the procurement of all or any approved drugs, chemicals, antibiotics, biologicals, and pharmaceutical preparations?
- — 40. Does the person filling the drug order review the prescriber's original order or direct copy?
- — 41. Are provisions provided for the return of containers with marred labels, unlabeled medications or discontinued medications to the pharmacy or drug room?
42. What is the disposition of discontinued or unused medications?
-

- ___ 43. Check the following person(s) who may remove
___ drugs from the drug room or pharmacy after closing
time.
___ physician
___ a designated (particular) nurse
___ any nurse
___ all of these
___ none of these
___ some other person
- ___ 44. When the pharmacy or drug room is closed, is the
___ quantity of drug or medication that may be removed
from the pharmacy or drug room restricted?
- ___ 45. Do you have a WRITTEN POLICY on automatic stop
___ orders? If yes, do you have an automatic stop order
for:
___ narcotics
___ hypnotics and sedatives
___ tranquilizers
___ antibiotics
___ steroids
___ mood elevators
___ Coumadin and other anticoagulants
- ___ 46. Is there written provision for recording on the
___ patient's record, each dose of medication administered?
- ___ 47. Do you have a policy for handling medications
___ brought into your facility by admitted patients?
If yes, is this policy written ___ or
verbal ___
- ___ 48. Are bedside medications allowed in your facility?
- ___ 49. Are radioactive medications used in this facility?
- ___ 50. Are empty medication containers from the nursing
___ stations returned to the pharmacy or drug room?
- ___ 51. Do drugs that are reconstituted on the nursing
___ stations carry an auxilliary label prepared by the
nurse?
- ___ 52. Are medication cards used for the preparation
___ and administration of most medications?

53. Cards #8, #9, #10.

___ 54. Are medications to be administered by the
nurses ever prepared several hours in advance?

___ 55. Are large volume (e.g. 1000 ml. I.V. solutions)
parenteral solutions used in your facility?

56. Cards #11 and #12.

___ 57. Are drugs and medications issued to nursing
stations on a periodic basis? If yes, please
check the following that apply. The period of
issue to nursing stations is:

_____ daily
_____ twice weekly
_____ once weekly
_____ monthly
_____ other (specify)

___ 58. Is a manual of policies and procedures provided
to control the administration of toxic or dangerous
drugs? (Coumadin, narcotics, antibiotics)
If yes, ask to see it and record the name of the
publication as shown on its cover.

59. Cards #13 and #14.

___ 60. Is there a procedure enforced in your institution
to provide that unused medications are not released to
discharged patients without proper outpatient labeling?
How do you enforce this procedure?

___ 61. Does your pharmacy compound or manufacture
solutions for hospital use such as alcohol, benz-
alkonium chloride or acetic acid?

___ 62. Are there any written specifications for control
of quality of these products prepared in the pharmacy?

___ 63. What organized systems are available in your
department for the dissemination of pharmaceutical
information? _____

___ 64. Do you provide an I.V. Additive Service in your
pharmacy?

- ___ 65. Is the person responsible for pharmaceutical
___ services a member of the Texas State Pharmaceutical
Association?
- ___ 66. Have you completed or do you employ a pharmacist
___ who has completed a residency in hospital pharmacy?
- ___ 67. Have you completed or do you employ a pharmacist
___ who has a Master's degree in Hospital Pharmacy?
68. How many hours a day is your pharmacy open? _____
69. What type of drug distribution system do you
use? _____
70. How many Pharmacy and Therapeutics Committee
meetings are held each year? _____

1. Check any of the following that are readily available to the person in charge of drugs:

☐ American Journal of Hospital Pharmacy
☐ Journal of American Pharmaceutical Association
☐ Remington's Practice of Pharmacy (13th edition)
☐ U.S. Dispensatory (25th or later edition)
☐ Modern Drug Encyclopedia (10th edition)
☐ a handbook on poisons
☐ a medical dictionary
☐ U. S. P. XVII
☐ Physician's Desk Reference, 1970 or 1971 edition
☐ Facts and Comparisons (with current additions)
☐ American Hospital Formulary Service
☐ Others (please specify) _____

2. Please place a check (✓) by any of the following registration classes in which your facility is registered with the Bureau of Narcotics.

☐ Class I ☐ Class IV
☐ Class II ☐ Class V
☐ Class III ☐ None of the above

3. Check each of the items available in your hospital:

- ☐ Polycillin capsules
- ☐ Amcil capsules
- ☐ Penbritin capsules
- ☐ Principen capsules
- ☐ Omnipen capsules

4. Check each of the items available in your hospital:

- ☐ Esidrex tablets
- ☐ HydroDiuril tablets
- ☐ Oretic tablets

5. Check each of the items available in your hospital:

☐ Ampicillin
☐ Methacillin
☐ Nafcillin (any brand, any dosage form)
☐ Oxacillin
☐ Cloxacillin
☐ Dicloxacillin

6. Check each of the items available in your hospital:

☐ Dilaudid Hypodermic tablets
☐ Codeine Hypodermic tablets

7. Check each of the items available in your hospital:

___ Tenuate Tablets

___ Tepanil Tablets

8. Check each of the items available in your hospital:

___ Tofranil

___ Pertofrane

___ Norpramin

9. Check each of the items available in your hospital:

___Elavil

___Aventyl

10. Check each of the items available in your hospital:

___Butazolidin

___Tandearil

11. Check each of the items available in your hospital:

☐ Permitil

☐ Prolixin

12. Check each of the items available in your hospital:

☐ Triavil

☐ Etrafon

13. Check each of the items available in your hospital:

___ Ilotycin

___ Erythrocin

___ Pediamycin

___ Ilosone

14. Which of the following persons attaches the supplementary label to IV bottles? (check as many as applicable)

___ RN

___ LVN

___ Nurses Aide

___ Pharmacist

___ Physician

___ Other (who???) _____