IMPORTANCE OF SELECTED CRITERIA USED BY PHARMACEUTICAL SERVICES COMMITTEE MEMBERS IN SELECTING PHARMACEUTICAL SERVICES IN SKILLED NURSING FACILITIES IN WISCONSIN

by

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This manuscript is dedicated with love to my wife, Bonnie, whose faith in me helped me to persevere, and to my parents, who instilled in me the value of hard work and a good education.

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ABSTRACT

The objectives of this study were to: (1) determine the importance of selected general criteria used by pharmaceutical services committee members (PSC) in selecting Vendor and Consultant Pharmacists' services in Skilled Nursing Facilities in Wisconsin; (2) assess if differences exist among the categories of committee members as to which general criteria were deemed to be most important; (3) assess if differences exist among PSC members from facilities of different ownership types as to which general criteria were deemed to be most important; (4) assess if differences exist among PSC members from facilities of different bed size categories as to which general criteria were deemed to be most important; and (5) explore the respondents' rating of relative importance of individual elements for each of the general criteria.

A seven page questionnaire was pretested then mailed to 560 PSC members from 140 SNFs selected as a random sample. A total of 261 respondents ranked the importance of the criteria. The general criteria for the Vendor Pharmacist were: distribution system, practice setting, location, and administrative, dispensing, delivery, regulatory and experience factors. The general criteria for the Consultant Pharmacist were: practice setting, location, and administrative, auxiliary, regulatory, clinical and experience factors.

The drug distribution system was the most important criterion in selecting Vendor Pharmacist services, with a unit dose system

preferred by 47 percent of the respondents. Experience was the most important criterion for selecting a Consultant Pharmacist's service, preferrably personal experience with a particular Consultant Pharmacist.

The differences found among the categories of PSC members suggested a tendency for: the Administrator showing more concern for the economic variables, the Consultant Pharmacist showing more concern for variables related to the expanding role of the profession, the Director of Nursing showing more concern for variables concerned with the traditional role of the pharmacist, and the Medical Director showing more concern for the patient care variables. The PSC member differences in the importance of the evaluative criteria found by ownership type showed a slight preference for personnel associated with for-profit facilties to be more concerned with economic variables. The PSC member differences in importance of the evaluative criteria among bed size categories suggest personnel associated with smaller facilities may be more concerned with acquiring pharmaceutical services, and less with the level of the services.

Further research is recommended to correlate the level of services present in a facility with the decision criteria found important in this study. Also, further research could determine if interactions are present among some of the variables considered for this study. Finally, this study provides baseline information for analyzing the criteria used by a group in selecting pharmaceutical services.

CHAPTER 1

INTRODUCTION

Researchers have investigated what factors motivate individual patients in the selection of a pharmacy for obtaining prescription drugs. Gagnon, in his review of the literature in this area, derived a list of eight significant patronage motives. These motives were: convenient location (close to home, work, physician or shopping), like the pharmacist, parking, price better than other pharmacies, less waiting time, like personnel, professional and convenience services, and quality and merchandise assortment.[1] In a study published in 1979, Baldwin, Riley and Wojcik asked consumers to rank the importance of six selected patronage motives. They found that more than 50 percent of the respondents considered important the factors of convenience, confidence in the pharmacist, price and know or like the pharmacist. The other two motives studied were price posting and delivery.[2] In another study, Wiederholt identified eleven dimensions of consumer patronage for prescription drugs: drug information/monitoring, personal relationship with the pharmacist, economics, friendly

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[1]Jean Paul Gagnon, "Factors Affecting Pharmacy Patronage Motives - a Literature Review." *Journal of the American Pharmaceutical Association*. Vol. NS17, September 1977, p. 558.

[2]H. John Baldwin, David A. Riley and Albert F. Wojcik, "Prescription purchasers' patronage motives," *Pharmacy Management*, Vol. 151, July-Aug 1979, p. 186.

personnel, perceived pharmacist competence, temporal convenience, shopping center location, tradition, expeditious convenience, near doctor's office and close to home.[3] Thus, in selecting a pharmacy for pharmaceutical services, an ambulatory patient makes the decision based on specific choice criteria.

In Skilled Nursing Facilities (SNFs) the decision for selecting pharmaceutical services is part of a group decision making process, rather than the individual process one usually goes through when choosing a pharmacy for obtaining prescription drugs in the community setting. The regulations which outline this process were published in the *Federal Register* on January 17, 1974, under the heading "Conditions of Participation; Skilled Nursing Facilities", and became effective February 19, 1974. Under the section of these regulations titled, "Condition of Participation-Pharmaceutical Services," a pharmaceutical services committee was mandated. This committee "develops written policies and procedures for safe and effective drug therapy, distribution, control, and use. The committee is comprised of at least the pharmacist, the Director of Nursing services, the Administrator, and one physician. The committee oversees pharmaceutical services in the facility, makes recommendations for improvement, and monitors the service to ensure its accuracy and

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[3]Joseph B. Wiederholt, "Development of an Instrument to Measure Evaluative Criteria that Patients Use in Selecting a Pharmacy for Obtaining Prescription Drugs." *Journal of Pharmaceutical Marketing and Management.* Vol. 1, Summer 1987, p. 46.

adequacy."[4] The regulations do not differentiate specifically between the Vendor and Consultant Pharmacist responsibilities, however it has been suggested that there are definite differences in their duties.[5]

The Vendor Pharmacist is considered the pharmacist responsible for the distribution of medications to the facility, and the Consultant Pharmacist is more involved in the clinical aspects of patient care. Therefore, criteria the committee considers when making the selection of both the Vendor and Consultant pharmaceutical services that are offered in a nursing home should be divided between these two areas. To my knowledge, there has not been extensive research that has examined the criteria the pharmaceutical services committee uses in making the selection of pharmaceutical services in a nursing home.

It is known that at least four different individuals are responsible for making recommendations on Vendor and Consultant pharmaceutical services for a patient residing in a nursing home. Do the members of the committee use similar evaluative criteria in choosing providers of pharmaceutical services as non-institutionalized patients use in choosing a pharmacy to obtain prescription drugs? Presumably each committee member places a level of importance on

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[4]United States Social Security Administration: Skilled Nursing Facilities Standards for Certification and Participation in Medicare and Medicaid Programs, *Federal Register*, 39:2238 17 January 1974.

[5]Jess M. Gaynor, "Separation of Consultant and Provider Pharmacists," *Hospital Formulary Management*, Vol. 9, March 1974, p. 14.

the criteria s/he considers in making the final decision. Thus, is the importance of the criteria that committee members use similar to the importance of criteria used by individual consumers in selecting a pharmacy for prescription drugs?

Furthermore, since each individual on the committee comes from a different health care orientation, minor differences among the importance of criteria used in selecting pharmaceutical services are expected to occur. How closely does the degree of importance placed on the different criteria used in this decision compare among the four members of the pharmaceutical services committee? Do differences exist in the importance placed on the criteria considered in facilities with different characteristics, such as ownership type or bed size?

Although researchers have studied and published evaluative criteria (patronage motives) used by patients in selecting a pharmacy for obtaining prescription drugs, there has been little information published in the literature regarding the importance of evaluative criteria used by the pharmaceutical services committee in making the selection of pharmaceutical services. Furthermore, it is important to examine how the members of the pharmaceutical services committee rate the importance of the evaluative criteria to determine where and to what extent differences in the importance occur. The importance placed on the evaluative criteria by the pharmaceutical services committee members from Skilled Nursing Facilities of different ownership types should be examined to determine if any differences

occur. And, the importance placed on the evaluative criteria by the pharmaceutical services committee members from Skilled Nursing Facilities of different bed size categories should be examined to determine if any differences occur.

CHAPTER 2

LITERATURE REVIEW

Prior to 1965 in the nursing home industry, the standardization of patient care was minimal. Individual states regulated their nursing homes by establishing and applying their own standards to those homes located in the State. In 1965, the Federal government enacted the Medicare program (Title XVIII) and the Medicaid program (Title XIX). Along with the establishment of these programs came the conditions of participation (the requirements nursing homes had to meet in order to participate in these programs) and the standards for payment. This Medicare legislation established specific provisions for post-hospital extended care benefits by "extended care facilities". However, the Medicaid legislation established "skilled nursing home services" without defining the scope of their services. This legislation resulted in the States defining the Medicaid benefits so broadly they covered a level of care lower than the Medicare benefits.[1]

To correct this situation, in 1972 Congress established a single uniform definition of "Skilled Nursing Facility". This extended the same level of care to both the Medicaid and Medicare programs. In 1974, revised conditions of participation for both Medicaid and

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[1]Department of Health and Human Services, "Medicare and Medicaid; Conditions of Participation for Long Term Care Facilities," *Federal Register*, Vol. 52, 16 October 1987, p. 38582.

Medicare programs were mandated. On 16 October 1987, new proposed rules were published in the *Federal Register*. If adopted, these new rules would change the conditions of participation for long term care facilities participating in the Medicare and Medicaid programs to a greater degree than any of the changes since 1974.[2]

Even though none of the regulations differentiate between a Vendor and Consultant Pharmacist, it is the regulations which help the pharmaceutical services committee to determine the evaluative criteria for the Vendor and Consultant Pharmacists. Also, other factors such as the experience or practice setting of the pharmacist are considered in addition to the standards published in the regulations.

This literature review includes an analysis of the information available to the pharmaceutical services committee members to determine the sources and the content of the evaluative criteria the committee members may consider in making their selection of the Vendor and Consultant Pharmacist's services in a long term care facility. Next, the issues underlying some of the criteria will be examined to gain insight into the importance of the criteria to the committee members. Finally, the variables which may influence the relative importance assigned to the evaluative criteria for selecting pharmaceutical services will be analyzed to determine why the differences in relative importance may occur among the variables.

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[2]Department of Health and Human Services, 16 October 1987, pp. 38582-38605.

Pharmacists' Services to Long Term Care Facilities

This section of the literature review will focus on the services that are provided to long term care facilities by both Vendor and Consultant Pharmacists. The services that are required by law will be described first, focusing on those regulations now in effect rather than on the proposed regulations. Then other Vendor and Consultant Pharmacist services provided to facilities as described in the literature will be reviewed.

The current regulations concerning pharmaceutical services in Skilled Nursing Facilities became effective in 1974. These regulations deal with the structure and process of health care delivery, and make no attempt to measure the outcome of the health care delivery system--quality of care. The requirements, for the most part, are found in the three standards of the Nursing Services Conditions of Participation and the four standards of the Pharmaceutical Services Conditions of Participation.[3] Classifying the responsibilities of the pharmacist, as defined by these regulations, results in four broad categories; dispensing and distributive functions, training function, policy development functions and monitoring functions.[4] The Vendor Pharmacist criteria are concerned primarily with the dispensing and

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[3]Samuel W. Kidder, "Pharmaceutical Services in Skilled Nursing Facilities," *Journal of the American Pharmaceutical Association*, Vol. NS15, January 1975, pp. 14-15.

[4]Samuel W. Kidder, "The Pharmacist's Responsibilities in Skilled Nursing Facilities," *Hospital Pharmacy*, Vol. 12, November 1977, p. 547.

distributive functions, whereas the Consultant Pharmacist criteria are concerned mainly with the training, policy development and monitoring functions.

The dispensing and distributive functions are related to the drug product itself and are involved with the traditional functions of the pharmacist. They require that the pharmacist:

> 1) Compound and dispense drugs or biologicals, prepare labels, and make labeling changes.
> 2) Transfer drugs or biologicals between containers.
> 3) Identify drugs and biologicals brought to the facility by the patient.
> 4) Label drugs for outpatient use.
> 5) Dispose of drugs and biologicals (in conjunction with the nursing staff) which have been discontinued or recalled, or have become outdated or deteriorated.[5]

The training function refers to the standard for staff development, which requires the development of an ongoing educational program for developing and improving the skills of all of the facility's personnel. Although not specifically mandated in the regulations, this could involve the pharmacist in training nurses and other personnel in aspects of drug ordering, dispensing, storage and monitoring.[6]

Policy development activities for the pharmacist are achieved by mandatory participation on two committees, the Infection Control Committee and the Pharmaceutical Services Committee. In the Infection Control Committee meetings, the pharmacist contributes

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[5]Samuel W. Kidder, (November 1977), p. 547.

[6]Samuel W. Kidder, (November 1977), p. 547.

expertise in the areas relating to the efficacy of various antiseptics and germicides or the appropriate use of antibiotics. The Pharmaceutical Services Committee is responsible for:

> 1) Receiving and appropriately acting upon the written report submitted quarterly by the pharmacist.
> 2) Establishing stop-order policies or other methods to assure the appropriateness of continued drug therapy.
> 3) Approving the contents of the emergency medication kit.
> 4) Developing policies and procedures for the safe storage and disposal of drugs and biologicals.
> 5) Determining which personnel will be authorized to have access to keys for drug storage areas.
> 6) Developing a list of abbreviations and chemical symbols that are approved for use in ordering medications in the facility.
> 7) Determining the labeling requirements for over-the-counter drugs.
> 8) Establishing policies for the use of drugs brought to the facility by the patient.
> 9) Determining what reference materials should be available to each nursing unit.
> 10) Establishing a system of patient identification to assure that drugs prescribed to one patient are not administered to another.
> 11) Developing procedures to assure that; a) drugs to be administered are checked against physicians' orders, b) the patient is identified before administration of the drug, c) each patient has an individual medication record, and d) the dose of drug administered to the patient is properly recorded in the patient's individual medication record by the person who administered the drug.[7]

Monitoring functions of the pharmacist are designed to enhance safe and effective drug therapy. These monitoring functions can be divided into two types: facility monitoring services and patient monitoring services. The facility monitoring services are:

1) Submit a quarterly report to the pharmaceutical services

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[7]Samuel W. Kidder, (November 1977), pp. 547-548.

committee on the status of the facility's pharmaceutical service and staff performance.
2) Periodically reconcile the number of controlled drugs in the facility with records of such drugs, and notify the Director of Nursing and the Administrator if discrepancies occur, and assist them in implementing more stringent control procedures if necessary.
3) Periodically determine if drugs and biologicals are locked and that controlled drugs are separately locked.
4) Periodically determine if drugs and biologicals are stored at proper temperatures.
5) Periodically determine that no discontinued, outdated, recalled or deteriorated drugs or biologicals are available for use in the facility.
6) Periodically determine if drugs for external use, as well as poisons, are kept separate from other medications.
7) Periodically determine if antiseptics, disinfectants, and germicides used in patient care have legible, distinctive labels that identify the contents and include instructions for use.
8) Periodically determine whether drug containers with illegible, incomplete, makeshift, damaged, worn or missing labels are returned to the dispensing pharmacist for proper labeling.
9) Periodically determine if stop-order policies are being followed.[8]

The patient monitoring services are:

1) Review the drug regimen of each patient and report any irregularities to the Medical Director and the Administrator.
2) Review the patient's drug regimen to detect any irregularities in drug administration and report these to the Director of Nursing and the Administrator.
3) Alert the Director of Nursing, when the need arises and as a part of the drug regimen review, to any nonadherence to policies and procedures relative to insuring that; a) drugs to be administered are checked against physician's orders, b) the patient is identified before administration of the drug, c) each patient has an individual medication record, d) drugs administered are properly recorded in the patient's individual medication record, and e) drugs and biologicals are administered as soon as possible after doses are prepared and are administered by the same person who prepared the

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[8]Samuel W. Kidder, (November 1977), pp. 548, 550.

doses for administration, except in unit dose systems.[9]

The above functions encompass only what has been mandated by Federal Regulations. Each individual State still has the option of adopting additional or more forceful regulations as they see fit to govern long term care facilities in their State. However, in the State of Wisconsin the regulations pertaining to long term care facilities reflect what is contained in the Federal regulations.[10]

In addition to the regulations, another source of documentation for possible criteria in choosing pharmaceutical services for nursing homes is studies that have been done to determine the level of pharmaceutical services to long term care facilities. The sections of studies examining the Vendor Pharmacist's services will be reviewed first, followed by the sections pertaining to the Consultant Pharmacist's services.

In 1974, researchers found that on-call coverage on a 24-hour-a-day basis was provided in 93 percent of Rhode Island's Skilled Nursing Facilities. However, only 6 percent of the facilities had a pharmacist who would prepare sterile intravenous solutions with drug additives.[11]

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[9]Samuel W. Kidder, (November 1977), p. 550.

[10]State of Wisconsin Department of Health and Social Services, *Wisconsin Administrative Code*, Chapter HSS 132 Nursing Home Rules, Effective 1 August 1982.

[11]Abilio W. Pires, Ronald M. Lombardi and Norman A. Campbell, "A Survey of Pharmaceutical Services to Skilled Nursing Facilities," *Hospital Formulary*, Vol. 11, April 1976, pp. 209, 212.

In a study of Michigan's long term care facilities conducted in 1979, it was found that a formulary had been instituted in 28.8 percent of the facilities, computerized service in 39.8 percent of the facilities, and that in 69.2 percent of the facilities the pharmacist would provide the patients with medications to take with them on leave for holidays.[12] Glaser, in a nationwide study, found that in 82 percent of Skilled Nursing Facilities the Vendor Pharmacist was at least partly computerized, and in 81 percent of the facilities the Vendor Pharmacist offered drug delivery once or more daily. Other services found to be offered by the Vendor Pharmacists in that study were: medication administration records (57%), drug order forms (52%), drug newsletter (33%), enteral nutrition products (54%), total parenteral nutrition products (40%), IV antibiotics/admixtures (51%), IV cancer chemotherapy (9%), and durable/disposable medical supplies (28%).[13]

As would be expected, the researchers analyzing the services provided to long term care facilities by Consultant Pharmacists have found these services are usually more clinical in nature than those provided by the Vendor Pharmacist. The researchers for the study of facilities in Rhode Island considered "regularly scheduled visits" to be a service and found that in 93 percent of the facilities the Consultant

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[12]Gregory S. Umstead, "Pharmaceutical Services in Michigan Long-Term Care Facilities," *Michigan Pharmacist*, Vol. 19, January 1981, p. 28.

[13]Martha Glaser, "Most Nursing Homes Rate Their Rx Providers Highly," *Drug Topics*, Vol. 128, 20 August 1984, p. 60.

Pharmacists provided this service. It also was found in that study that the Consultant Pharmacist participated in utilization review in 30 percent of the facilities.[14] In the study of long term care facilities in Michigan the Consultant Pharmacist was involved in drug utilization review in 77.2 percent of the facilities. Other services provided by the Consultant Pharmacists in that study were: screening for drug interactions (79.3%) and adverse drug reactions (54.4%), participating on a patient care committee (30.8%), attending physician patient rounds (4.1%) and consulting with patients such as obtaining medication histories (15.4%) and discharge consultations (3.6%).[15]

In addition to the previously mentioned studies examining long term care facility pharmaceutical services, there are other published works that can be analyzed to determine if all of the pharmaceutical services for long term care facilities have been included. Reviewing such works further identifies possible evaluative criteria that could be used by the pharmaceutical services committee in making their selection of pharmaceutical services. The guidelines published by the American Society of Consultant Pharmacists list additional service areas as:

1) The Consultant Pharmacist seeks the qualifications to practice as a Consultant Pharmacist.
2) The Consultant Pharmacist maintains at least 20 contact

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[14]Abilio W. Pires, Ronald M. Lombardi and Norman A. Campbell, p. 209.

[15]Gregory S. Umstead, p. 28.

hours of post-graduate continuing education annually in subjects relative to the practice of consultant pharmacy in order to assure continued competence.
3) The Consultant Pharmacist practices within the bounds of all State and Federal laws and regulations and the Code of Ethics of the American Society of Consultant Pharmacists.
4) The Consultant Pharmacist enters into a written contractual agreement with the long term care facility to which s/he provides service.
5) The Consultant Pharmacist supervises the entire spectrum of the pharmaceutical services in the long term care facility, seeking as a goal the attainment and maintenance of the highest quality pharmaceutical services.
6) The Consultant Pharmacist assesses the drug therapy of each patient at least monthly.[16]

Other authors list additional service guidelines in the areas of nursing station inspections, evaluation of staff performance and system effectiveness, cost containment programs, documentation channeling, drug information and drug history and pharmacokinetics.[17] Another service area is the Consultant Pharmacist's liaison with the Vendor pharmacy.[18]

In summary, the evaluative criteria gathered from a review of the literature can be divided into two categories. The Vendor Pharmacist criteria include: the dispensing and distributive functions noted in the

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[16]"Guidelines for Consultant Pharmacists Practicing in Long Term Care Facilities," American Society of Consultant Pharmacists, 1981, 2300 Ninth St., South, Suite 503, Arlington, VA 22204.

[17]Mark I. Abrams, John A. Gans and Philip P. Gerbino, "Consultant Services to Nursing Homes," *The Pharmacist's Business Notebook*, Vol. 6, 1982, pp. 1-11.

[18]Jerome L. Fine, "The Administrator's Contract Guide to Consultant Pharmacy," *The Consultant Pharmacist*, Vol. 2, November/December 1987, p. 520.

regulations, the availability of on-call services, the preparation of sterile intravenous solutions, the frequency of drug delivery, and the availability of various administrative forms and documents. The Consultant Pharmacist criteria include: the training, policy development and monitoring functions of the regulations, participation on patient care or utilization review committees, the performance of drug interaction screening, pharmacokinetic counseling or discharge counseling, and the inspection of nursing stations.

Presumably the members of the pharmaceutical services committee would consider some or all of the aforementioned criteria gleaned from this selective literature review. However, it should be noted that other criteria may exist. Each committee member may bring into their decision for the selection of pharmaceutical services some evaluative criteria either from their own personal experiences or from discussions with their colleagues on the selection of pharmaceutical services. For example, additional criteria could be the criteria for establishing a back-up system of medications for the facility. These could include the timeliness of replacement or the contents of the system.

Effects of the Distribution System

In this section, an evaluative criterion which is most representative of the Vendor Pharmacist, the distribution system chosen for the nursing home, will be examined with regard to the impact the pharmacist can have in this area. Researchers in hospital

based studies have demonstrated the advantages of the unit-dose drug distribution system over traditional distribution systems in the areas of reduced medication errors, personnel costs and overall drug costs.[19,20,21,22,23]

However, the long term care facility setting is different from the hospital setting. Two of the main differences are the length of stay and the chronic disease states of the patients.

In reviewing studies comparing drug distribution systems in long term care facilities, the components analyzed included nursing time, pharmacy time, medication error rate and drug waste linked with the cost of the system. Not all of these components were analyzed in each of the studies. Also, it should be noted that different types of distribution systems often were analyzed thus making direct

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[19]Clifford E. Hynniman, et al., "A 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*, Vol. 27, October 1970, pp. 802-814.

[20]Wallace E. Slater and Joseph R. Hripko, "The Unit-Dose System in a Private Hospital. Part Two: Evaluation," *American Journal of Hospital Pharmacy*, Vol. 25, November 1968, pp. 641-648.

[21]Donald F. Beste, Jr., "An Integrated Pharmacist-Nurse Approach to the Unit-Dose Concept," *American Journal of Hospital Pharmacy*, Vol. 25, August 1968, pp. 397-407.

[22]Roger Klotz, "PEDIADOSE-Pediatric Unit Dose Dispensing," *American Journal of Hospital Pharmacy*, Vol. 27, February 1970, pp. 132-135.

[23]William E. Smith and Dennis W. Mackewicz, "An Economic Analysis of the PACE Pharmacy Service," *American Journal of Hospital Pharmacy*, Vol. 27, February 1970, pp. 123-126.

comparisons among the studies improper.

Nursing time was analyzed in five different studies. Sometimes it was divided into five basic areas: dosage preparation, drug administration, charting (record maintenance), audit of controlled drugs and ordering drugs. In other studies an aggregate figure, such as the number of minutes involved in medication administration per nursing shift, was used to determine which system utilized more nursing time.

The most indepth study on nursing time as related to SNF distribution systems was done by Farner and Hicks. They found an average of 3.22 minutes were required for administration of a dose in the traditional system, 1.91 minutes for a 24-hour unit-dose system and 1.07 minutes for a 72-hour unit-dose system.[24] Crawley, Eckel and McLeod found that implementing a unit-dose system in a 52-bed nursing home reduced nursing time involved with medication activities in a 24-hour period from 7 hours and 51 minutes to 4 hours and 16 minutes.[25] Mathieson and Rawlings noted that 112 minutes were saved on one nursing shift by implementing a unit-dose system in a 42-bed

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[24]James Farner and Charles I. Hicks, "The Impact of Drug Distribution Systems on Nurses Time Involvement in Medication Related Activities in Long Term Care Facilities," *Drug Intelligence and Clinical Pharmacy*, Vol. 10, August 1976, p. 460.

[25]Henry K. Crawley, III, Fred M. Eckel and Don C. McLeod, "Comparison of a Traditional and Unit Dose Drug Distribution System in a Nursing Home," *Drug Intelligence and Clinical Pharmacy*, Vol. 5, June 1971, pp. 166-171.

nursing home.[26] Lepinski, et al., projected that 1507.2 hours per year less nursing time were required by implementing a unit-dose system in a 352-bed nursing home.[27] Contrary to these studies, Reitberg, Miller and Bennes found there was no significant difference in nursing time involved between a traditional and a "modified" traditional (30-day blister pack) system.[28]

Pharmacy time was divided into dispensing pursuant to medication orders, record keeping and pricing, consultative activities and delivery activities. In three studies researchers analyzed the pharmacy component of the distribution system. Mathieson and Rawlings found that although more time was required for processing and dispensing pursuant to a medication order under the unit-dose system, it was less expensive because of a greater utilization of subprofessionals.[29] Reitberg, Miller and Bennes found a greater amount of pharmacist and pharmacy technician time was required for processing a prescription

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[26]Donald R. Mathieson and John L. Rawlings, "Evaluation of a Unit Dose System as Implemented by a Community Pharmacy," *American Journal of Hospital Pharmacy*, Vol. 28, April 1971, pp. 258-259.

[27]Penny W. Lepinski, et al., "Cost Comparison of Unit Dose and Traditional Drug Distribution in a Long-Term-Care Facility," *American Journal of Hospital Pharmacy*, Vol. 43, November 1986, p. 2776.

[28]Donald P. Reitberg, Robert J. Miller and Joseph F. Bennes, "Evaluation of Two Concurrent Drug-Delivery Systems in a Skilled-Nursing Facility," *American Journal of Hospital Pharmacy*, Vol. 39, August 1982, p. 1318.

[29]Donald R. Mathieson and John L. Rawlings, p. 256.

order under the modified traditional system.[30] In a related study, Strandberg and Stennett found the average daily cost of operation (labor plus overhead) for a pharmacy was more for a pharmacy utilizing the unit dose or 30-day card system of distribution, than it would have been if the pharmacy had used the traditional prescription vial system.[31]

In medication error rate studies, four different types of medication errors are measured. The errors are: (1) when an ordered drug is omitted, (2) when an unordered drug is given, (3) the wrong amount or dosage form of the drug is given, and (4) the drug is given at the wrong time (60 or more minutes from the scheduled time), called administration time errors. Then the error rate is calculated by combining all types of errors that occur and dividing by the opportunity for error. The opportunity for error is the number of doses administered plus the number of doses omitted.

The modified traditional system analyzed by Reitberg, Miller and Bennes showed improvement only in the elimination of administration time errors. There was no significant difference if administration time

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[30]Donald P. Reitberg, Robert J. Miller and Joseph F. Bennes, p. 1319.

[31]Lee R. Strandberg and Douglass J. Stennett, "Drug Distribution Systems in Oregon's Long-Term Care Facilities," *Hospital Formulary*, Vol. 16, June 1981, p. 628.

errors were excluded.[32] Crawley, Eckel and McLeod saw a drastic improvement in the error rate after the implementation of a unit-dose system. The error rate dropped from about 59 percent to approximately two percent. Even with the exclusion of administration time errors, the rate dropped from 26 percent to approximately two percent.[33] Lepinski, et al., found that the mean error rate dropped from 8.53 percent to 0.97 percent after implementing the unit-dose system.[34]

Researchers analyzed drug waste and cost in a total of seven studies. Lepinski, et al., and Reitberg, Miller and Bennes, concluded that the traditional system was still less expensive than the unit-dose and modified traditional systems, respectively, after factoring in the dollar value of the drugs wasted in the traditional system.[35,36] Mathieson and Rawlings found that drug waste accounted for 16 percent of the total drug bill for nursing home patients, and after combining all costs, concluded that the traditional and unit-dose

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[32]Donald P. Reitberg, Robert J. Miller and Joseph F. Bennes, p. 1318.

[33]Henry K. Crawley, III, Fred M. Eckel and Don C. McLeod, p. 170.

[34]Penny W. Lepinski, et al., p. 2777.

[35]Penny W. Lepinski, et al., p. 2777.

[36]Donald P. Reitberg, Robert J. Miller and Joseph F. Bennes, p. 1319.

systems are comparable in price to the patient.[37] In three separate studies, Parrott, Brown and Kirk, and Farmer, et al., concluded that a unit-dose system of drug distribution in a long term care facility would generate substantial savings on medications due to the cost of medications discarded under a traditional system.[38,39,40] In the Strandberg and Stennett study, they combined the daily drug and pharmacy cost of providing services, which revealed that the unit dose cost was 26.9 percent less than the traditional system, and the 30-day card system was 15.8 percent less than the traditional system.[41]

In reviewing the literature in the area of drug waste costs as related to the drug distribution system, Kidder concluded that the average drug waste cost for a traditional drug distribution system was about $3.12/patient/month, and the drug waste costs could be reduced from 75 percent to 83 percent by implementing a unit dose system. Also, after factoring in the added pharmacy costs of a unit dose

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[37]Donald R. Mathieson and John L. Rawlings, p. 258.

[38]Keith A. Parrott, "Drug Waste in Long-Term Care Facilities: Impact of Drug Distribution System." *American Journal of Hospital Pharmacy*, Vol. 37, November 1980, p. 1533.

[39]Charles H. Brown and Kenneth W. Kirk, "Cost of Discarded Medication in Indiana Long-Term Care Facilities," *American Journal of Hospital Pharmacy*, Vol. 41, April 1984, p. 699.

[40]Richard G. Farmer, et al., "Cost of Drugs Wasted in the Multiple-Dose Drug Distribution System in Long-Term-Care Facilities," *American Journal of Hospital Pharmacy*, Vol. 42, November 1985, p. 2490.

[41]Lee R. Strandberg and Douglass J. Stennett, p. 628.

system, there still was a 1.78 percent to 27 percent savings in overall costs.[42]

In summary, there were problems associated with many of the studies reviewed, i.e. lack of some type of control, small sample size in terms of nursing homes covered, variations between different nursing homes as to policies for drug administration and differing terminology making it difficult to compare types of distribution systems. Most authors recommend some type of unit-dose system as a viable alternative to the traditional system of drug distribution used in nursing homes. However, it should be kept in mind that the final decision is to be made by the pharmaceutical services committee, because

> "(t)here is no perfect system of drug distribution which is best for all skilled nursing facilities. Each has its own special needs and each system has its advantages and disadvantages. It is important for the pharmacist to fully understand each drug distribution system so that he can describe them to the pharmaceutical services committee to assist it to make a rational decision based upon the advantages and disadvantages of each."[43]

Effect of Consultant Pharmacist's Clinical Services

Similar to the choice of appropriate criteria for the selection of

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[42]Samuel W. Kidder, "Review of Drug Waste in Long Term Care Facilities 1976-1983," *Journal of Geriatric Drug Therapy*, Vol. 1, Spring 1987, pp. 40-42.

[43]Robert B. Supernaw and Patrick N. Catania, "Drug Distribution Systems in the Skilled Nursing Facility," *U.S. Pharmacist*, Vol. 5, September 1980, pp. 33-34.

a Vendor Pharmacist, the choice of criteria for selecting a Consultant Pharmacist will have an impact on the pharmaceutical services provided in a long term care facility. The Consultant Pharmacist's services usually are clinical, such as performance of the drug regimen review and conducting in-service education programs.

In 1974, the Department of Health, Education and Welfare promulgated regulations to implement the Social Security Act of 1972. These regulations changed the pharmacist's position in skilled nursing facilities from an administrator of a drug distribution system to "the primary individual responsible for developing, coordinating and supervising all pharmaceutical services including promoting the rational prescribing and clinical use of drugs."[44] This was the most dramatic development for expanding the role of pharmacists in the responsibility for long term care facility patients. To the traditional responsibilities of drug procurement, distribution and control, there were added responsibilities that required the pharmacist to monitor each patient's drug therapy at least monthly. Other added responsibilities were: providing in-service education for SNF personnel, providing drug information, patient counseling, and participation in meetings of the pharmaceutical services, infection control, and utilization review

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[44]Bruce G. Kay, David N. Adelman and Harris Brodsky, "The Changing Role of the Pharmacist in a Long Term Care Institution," *Long Term Care and Health Services Administration Quarterly*, Vol. 1, Spring 1977, p. 19.

committees.[45]

This section addresses those studies that assess the effectiveness of the Consultant Pharmacist in monitoring patients' drug therapy and providing in-service education for SNF personnel. For most of the studies which assess monitoring drug therapy, there are seven types of drug-related problems that are defined and brought to the prescriber's attention.

> 1) Therapeutic duplication. This is defined as more than one agent being used to treat an established diagnosis where optimum assessment of benefits of a single agent were not evident from patient data. The example given is of Haldol^{R} and Mellaril^{R} both being used in the treatment of dementia.
> 2) Drug relative contraindication. Defined as the presence of underlying established diagnoses, abnormal laboratory test, physical or physiologic condition or drug that would necessitate reconsideration of drug use. An example of this is the use of a potassium supplement in a patient with moderate renal impairment.
> 3) No therapy for established diagnosis. This is the presence in the database of a condition that there was not at the time a prescribed therapy. An example is a history of glaucoma with no medication prescribed to treat glaucoma.
> 4) No established diagnosis, but a drug was prescribed. This is self-explanatory. An example is PRN Elavil^{R} for sleep or dementia.
> 5) Anticipated or suspected adverse reaction to drug or interaction between drugs. This is defined as the potential or presence of signs, symptoms, and/or laboratory test abnormalities that necessitate some prescriber action to change dose, add or delete drug to diminish the problem.
> 6) Drug efficacy. Defined as drugs on state formulary list that are no longer covered by Medicaid, or agents judged to be "less than effective". An example is papaverine used to treat dementia.
> 7) Change in dose, product or dosage form to improve likelihood of therapeutic success with less expense. Also

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[45]Bruce G. Kay, David N. Adelman and Harris Brodsky, p. 19.

> self-explanatory. Examples are change nitroglycerin ointment to sublingual tablet PRN chest pain, or combining hydrochlorothiazide and hydralazine treatment as one combination product.[46]

In addition to drug-related problems, the pharmacist also attempts to identify any administrative problems that may occur. These are usually brought to the attention of the nursing staff for correction before the prescriber would be notified. The administrative problems fit into three categories:

> 1) Missed communication. For example a known penicillin allergy that is not indicated on the patient's chart. 2) Charting error. An example is charting Normal Saline solution instead of Renacidin for catheter irrigation. 3) Transcription error. For example a chlorpromazine PRN order transcribed as scheduled administration.[47]

Cheung and Kayne, in a study of 517 patients in three different facilities over an 11 month period, found that a Consultant Pharmacist detected 33 preventable adverse drug reactions per 1000 patient months, reduced medication errors from 20 percent to 8 percent of doses administered, reduced inappropriate or unnecessary drugs and

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[46]James W. Cooper, "Effect of Initiation, Termination, and Reinitiation of Consultant Clinical Pharmacist Services in a Geriatric Long-Term Care Facility," *Medical Care*, Vol. 23, January 1985, p. 85.

[47]Douglas A. Miller, et al., "Perceived Clinical Significance of Consultant Pharmacist Recommendations in the Skilled Nursing Facility," *Drug Intelligence and Clinical Pharmacy*, Vol. 14, March 1980, p. 183.

produced an overall savings effect of $0.73/patient/day.[48] Using 147 patients in one Skilled Nursing Facility over a 31 month period, Thompson and Floyd found that the Consultant Pharmacist could prevent six adverse drug reactions/100 patients/month to produce a savings of $9000/year in 1977 dollars, or approximately $0.20/patient/day.[49]

Cooper and Bagwell, in a study of 142 patients over a one year period, found that with the influence of a Consultant Pharmacist, the number of regularly scheduled drugs per patient was reduced from 3.30 to 2.66 for a 19.4 percent decrease. The nonscheduled drugs were reduced from 3.92 to 2.12 drugs per patient for a 45.9 percent decrease. Overall, then, the reduction was from 7.22 to 4.78 drugs per patient for a 33.8 percent decrease.[50] In a study lasting eight years, Strandberg, et al., analyzed 10 percent of 4,004 patient records from three different facilities and found that the Consultant Pharmacists' services led to a 42.8 percent decrease in the number of prescription

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[48]Alan Cheung and Ronald Kayne, "An Application of Clinical Pharmacy Services in Extended Care Facilities," *California Pharmacist*, Vol. 23, September 1975, pp. 22-25, 28, 43.

[49]John Thompson and Ronald Floyd, "Cost-Analysis of Comprehensive Consultant Pharmacist Services in the Skilled Nursing Facility: A Progress Report," *California Pharmacist*, Vol. 26, August 1978, pp. 22, 24, 26.

[50]James W. Cooper and C. Greg Bagwell, "Contribution of the Consultant Pharmacist to Rational Drug Usage in the Long-Term Care Facility," *Journal of the American Geriatrics Society*, Vol. 26, November 1978, p. 518.

drugs and a 34.6 percent decrease in the number of prescribed doses administered. Also, after adjusting for inflation, the average monthly medication bill per patient decreased by 28.9 percent.[51] Young, et al., in a study of 25 patients over a five month period showed that a Consultant Pharmacist's input could decrease the total number of drugs by 30 percent or the total number of administered doses by 18.6 percent in the first month. This reduction was shown to be sustained over at least five months. The savings due to decreased medication costs and nursing medication administration time were extrapolated to be approximately $1.7 million annually for the State of Washington alone.[52]

A study done by Cooper on 142 patients in one facility over four years was unique in that it showed the effect of initiation, termination and reinitiation of Consultant Pharmacist's services. In that study, when the Consultant Pharmacist was retained there was a decrease of from 4.1 to 4.7 drugs per patient. There also were decreased admission, discharge and death rates when a Consultant Pharmacist was retained. However, an interesting effect seen in this study was that the hospitalization rate actually increased when a Consultant

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[51]Lee R. Strandberg, et al., "Effect of Comprehensive Pharmaceutical Services on Drug Use in Long-Term Care Facilities," *American Journal of Hospital Pharmacy*, Vol. 37, January 1980, p. 93.

[52]Lloyd Yee Young, et al., "Decreased Medication Costs in a Skilled Nursing Facility by Clinical Pharmacy Services," *Contemporary Pharmacy Practice*, Vol. 4, Fall 1981, pp. 233-237.

Pharmacist was retained.[53] Chrymko and Conrad, in a study of 19 patients followed over 14 months, found that a Consultant Pharmacist can decrease the average number of scheduled and nonscheduled medications per patient in just two months. They also found there was a significant increase in the average number of nonscheduled medications one year after the removal of the Consultant Pharmacist's input.[54]

Wilcher and Cooper analyzed the effect of a Consultant Pharmacist when reviewing just analgesic and anti-inflammatory drug usage in a 143 patient population over 33 months. They found the Consultant Pharmacist significantly reduced the percentage of codeine-containing analgesics per patient, and there was an overall decrease in total drug usage from 7.2 to 4.8 drugs per patient. However, the percentage of anti-inflammatory agents and acetaminophen used per patient significantly increased over the 33 month study period.[55] In a similar study, Williamson, et al., analyzed the effect of a Consultant Pharmacist on antihypertensive therapy for 30 patients over a one year period. They found that although both the average systolic and

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[53]James W. Cooper, pp. 86-87.

[54]Margaret M. Chrymko and Wayne F. Conrad, "Effect of Removing Clinical Pharmacy Input," *American Journal of Hospital Pharmacy*, Vol. 39, April 1982, p. 641.

[55]Debra Elaine Wilcher and James W. Cooper, "The Consultant Pharmacist and Analgesic/Anti-Inflammatory Drug Usage in a Geriatric Long-Term Care Facility," *Journal of the American Geriatrics Society*, Vol. 29, September 1981, pp. 429-432.

diastolic pressure for all patients increased, the number of patients with hypotensive readings decreased. Also, the average antihypertensive drug cost decreased.[56] Berchou assessed the effect of a Consultant Pharmacist on the prescribing patterns in an institution for the mentally retarded. He found that after the retention of the Consultant Pharmacist the percentage of patients receiving antipsychotics or anticonvulsants as a single drug entity increased, but those receiving multiple agents decreased, so the overall percentage of patients receiving these agents remained unchanged. There also were fewer patients receiving no long-term medications.[57]

In a study conducted in Canada, Studnicki-Gizbert and Segal assessed the effect of a Consultant Pharmacist in two nursing homes. In each of the facilities and another facility chosen as a control, 60 patients were chosen for the pharmacist to review the drug regimens and make recommendations. The Consultant Pharmacist was found to have a significant impact in one of the facilities. This impact led to a reduction in the average number of medications prescribed per patient from 5.7 to 5.0; in the average number of doses administered per patient from 8.0 to 6.6; and in the average cost per resident per

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[56]Debbie E. Williamson, et al., "Consultant Pharmacist Impact on Antihypertensive Therapy in a Geriatric Long-Term Care Facility," *Hospital Formulary*, Vol. 19, February 1984, pp. 125-126.

[57]Richard C. Berchou, "Effect of a Consultant Pharmacist on Medication Use in an Institution for the Mentally Retarded," *American Journal of Hospital Pharmacy*, Vol. 39, October 1982, pp. 1671-1674.

day from $1.24 to $0.99 for this facility. In the second study facility and the control facility, there was no change in medication use over the study period. It also was found that 77 percent of the Consultant Pharmacist's recommendations were accepted by the physician in the control facility.[58]

In a study of the monthly chart reviews in ten skilled nursing facilities over a one year period, Witte, et al., found the Consultant Pharmacist detected drug therapy problems at a rate of 7.1 percent. Over 58 percent of these problems refer to requests made by the Consultant Pharmacist for more objective data needed for monitoring or recommendations concerning indications for medication use.[59]

Miller, et al., tried to assess the perceived clinical significance of the Consultant Pharmacist's recommendations for 79 patients over a six month period. About 72 percent of the recommendations were accepted by the SNF physicians, and all of the recommendations were perceived to be clinically significant by a review panel of physicians. However, the recommendations accepted by the SNF physicians were perceived to be more clinically significant than those rejected. They concluded that Consultant Pharmacists can have a significant input

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[58]Donna Studnicki-Gizbert and Harold J. Segal, "Effectiveness of Selected Pharmacy Services in Long Term Care Facilities," *Journal of Social and Administrative Pharmacy*, Vol. 1, 1983, pp. 187-193.

[59]Kenneth W. Witte, et al., "Drug Regimen Review in Skilled Nursing Facilities by Consulting Clinical Pharmacists," *American Journal of Hospital Pharmacy*, Vol. 37, June 1980, pp. 822-823.

into disease management for SNF patients.[60] In a study on the effect of a Consultant Pharmacist's review of nursing home admission orders, Cooper found that a Consultant Pharmacist can identify more therapy-related problems than other health professionals and can improve the initial drug use in the facility. The physicians accepted 80 percent of the Consultant Pharmacist's recommendations in that study.[61]

In addition to the reported studies on the effects of Consultant Pharmacist conducted drug regimen reviews in long term care facilities, researchers reviewed the literature for these effects. McGhan, et al., conducted a meta-analysis on 15 different studies of drug regimen reviews. Their conclusion was that between 20 and 144 studies averaging 149 subjects per study showing no effect of drug regimen reviews would be needed to cancel the effect of the 15 studies included in the analysis.[62] Kidder performed a review of 23 studies dealing with the Consultant Pharmacist's drug regimen review. After reviewing all of the studies, he conducted a cost-benefit analysis and concluded that $220 million could be saved annually by having pharmacists perform drug regimen reviews for all Medicare and

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[60]Douglas A. Miller, et al., pp. 182-186.

[61]James W. Cooper, "Effects of Intensive Consultant Pharmacy Review of Nursing Home Admission Orders," *The Consultant Pharmacist*, Vol. 2, March/April 1987, pp. 152-155.

[62]William F. McGhan, et al., "A Meta-Analysis of the Impact of Pharmacist Drug Regimen Reviews in Long-Term Care Facilities," *Journal of Geriatric Drug Therapy*, Vol. 1, Spring 1987, pp. 23-34.

Medicaid patients in Skilled Nursing Facilities and Intermediate Care Facilities. The savings would result from reduced drug use and decreased hospitalizations.[63] However, it is best to keep in mind that, "(t)he role of a pharmacy consultant and pharmacy in general is not to determine how many medications can be discontinued, but to aid in implementing the most rational treatment regimen."[64]

Only one study was found that reported the effectiveness of the Consultant Pharmacist in the area of in-service education. The study, conducted by Westfall and Speedie, used a pre-test, post-test design with a control group. The in-service education was conducted in two facilities, with two "matched" facilities serving as the control group. The study group did obtain higher scores on the post-test, but testing error might be a major limitation of the study. The in-service programs were presented in the two weeks between the pre-test and the post-test, and they focused on topics covered on the test. However, in addition to the scores on the test instruments, objective criteria were used to evaluate changes in drug therapy or drug therapy monitoring by the nurses. In this area, the nursing personnel in the study facilities took the appropriate action in 31 out of 52 (59.6%) episodes, compared with the control group taking appropriate action in

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[63]Samuel W. Kidder, "Cost-Benefit of Pharmacist-Conducted Drug-Regimen Reviews," *The Consultant Pharmacist*, Vol. 2, September/ October 1987, pp. 394-398.

[64]Richard C. Berchou, p. 1674.

four out of 49 (8.2%) episodes.[65]

Some limitations are applicable to the studies mentioned in this section of the literature review. First, the study population is very small in most of the studies, which makes it inappropriate to try to generalize the results to a larger population. For example, in the study by Young, et al., the study population was only 25 patients, which decreased to 22 patients by the fifth month, but these results were extrapolated to obtain the savings for the whole State of Washington.[66] Even in the study of in-service education done by Westfall and Speedie, there were only 39 nurses studied in four facilities.[67] Second, many of these studies focus on the savings attributable to Consultant Pharmacist services and fail to mention the costs that are involved with these services. If the costs for Consultant Pharmacist services are calculated, the reimbursement rate for the Consultant Pharmacist is frequently either not included or is not mentioned, so it is difficult to determine the accuracy of these cost calculations.

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[65]Lawrence K. Westfall and Stuart M. Speedie, "The Effect of In-service Education Provided by Consultant Pharmacists on the Behavior of Nurses in Long-Term Care Facilities," *Drug Intelligence and Clinical Pharmacy*, Vol. 15, October 1981, pp. 778-780.

[66]Lloyd Yee Young, et al., pp. 233-237.

[67]Lawrence K. Westfall and Stuart M. Speedie, pp. 777-781.

Variables Which May Influence the Importance of Evaluative Criteria

After reviewing the sources and identifying the evaluative criteria, and the issues underlying three of these criteria, an assessment needs to be made of those variables which may influence the importance of the evaluative criteria used by the pharmaceutical services committee for selecting pharmaceutical services for long term care facilities. The first variable is the profession with which a particular pharmaceutical services committee member is affiliated (i.e. Administrator, Director of Nursing, Medical Director or Consultant Pharmacist). Differences in the importance of the evaluative criteria may appear here because of the different functions the members of the committee perform in the health care system. Other areas that may lead to differences in the evaluative criteria among the members are their practice backgrounds or their educational training. As an example, consider the difference in educational training between the nursing home Administrator and the Consultant Pharmacist at a facility. The nursing home Administrator may have experience ranging from a high school diploma to a bachelor's or master's degree in Health Services Administration, with emphasis on economic and management issues.[68] However, the Consultant Pharmacist serving the facility will have from five to seven years of post-high school

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[68]Robert P. Hey, "Nursing-home Care Moves into Era of Professionalism," *The Christian Science Monitor*, 16 December 1986, pp. 3, 8.

education, most of it concentrating on the pharmacological actions and therapeutic use of drugs.[69]

Another area that may cause differences in the importance placed on the evaluative criteria by the pharmaceutical services committee members is the type of ownership of the facility with which the member is affiliated. Thus pharmaceutical services committee members from a investor-owned facility may have different perspectives on the optimum pharmaceutical services than the members from a not-for-profit or governmental facility. Differences in the economic performance of hospitals already have been shown based on their ownership type. Watt, et al., have shown that investor-owned chain hospitals have significantly higher total charges and net revenues per case, drug and medical supply costs per day, and capital costs in proportion to operating costs when compared to not-for-profit hospitals. These same researchers also have shown that investor-owned hospitals have higher administrative overhead costs, but that they are more profitable than not-for-profit hospitals.[70]

Differences in economic performance by ownership type have been shown to exist in nursing home settings as well. In a review of

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[69]Anonymous, "Bulletin of the University of Wisconsin-Madison: School of Pharmacy," Publications Office, 511 WARF, 610 Walnut St., Madison, WI 53705, Vol. 1987, October 1987.

[70]J. Michael Watt, et al., "The Comparative Economic Performance of Investor-Owned Chain and Not-For-Profit Hospitals," *The New England Journal of Medicine*, Vol. 314, 9 January 1986, pp. 89-96.

the literature of studies concerned with overall nursing home cost, Bishop concluded that "(c)ost studies have consistently found that facilities owned and operated by nonprofit voluntary and government organizations have higher costs than for-profit nursing homes by at least several dollars per day."[71] Also from this review it was concluded that hospital-based nursing home care was more expensive on a per patient day basis.[72]

Birnbaum, et al., reviewed 11 cost analyses done on 20 different sets of nursing home data. They also concluded that overall costs are less in facilities operated by for-profit organizations. In fact, the studies they reviewed tried to control for services offered, patient mix and quality of care, yet "the cost differentials between for-profit, nonprofit, and government providers persist(ed)."[73] Arling, Nordquist and Capitman studied 150 nursing homes in Virginia. They also found that overall operating costs were higher in public/nonprofit homes. In addition, there was evidence of interaction effects among ownership type and the case mix of a facility, the region in which it was located

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[71]Christine E. Bishop, "Nursing Home Cost Studies and Reimbursement Issues," *Health Care Financing Review*, Vol. 1, Spring 1980, p. 50.

[72]Christine E. Bishop, p. 50.

[73]Howard Birnbaum, et al., "Why Do Nursing Home Costs Vary? The Determinants of Nursing Home Costs." *Medical Care*, Vol. 19, November 1981, p. 1097.

and the percent of Medicaid patients residing in the facility.[74]

To lend further support to the idea that ownership type may influence the way in which a nursing home is operated, one can examine Beverly Enterprises, the largest provider of long-term care in the United States. They have diversified their operations into retirement living units, congregate living centers, home health agencies and pharmacy services. The reasons for the diversification are to increase ancillary income, and also to deliver cost-effective care to their facility residents.[75]

One final area to be reviewed that may lead to differences in the importance of the evaluative criteria used by pharmaceutical services committee members for selecting pharmaceutical services is the effect of a facility's bed size. Bishop concluded that the studies she reviewed had inconsistent findings for the effect of size on the overall cost of providing care. In the studies on bed size that did find an effect, it was just a few cents more for each additional bed. She concluded "(s)ome researchers have shown average costs to increase as the number of beds increases, while others show declining costs."[76]

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[74]Greg Arling, Richard H. Nordquist and John A. Capitman, "Nursing Home Cost and Ownership Type: Evidence of Interaction Effects," *Health Services Research*, Vol. 22, June 1987, pp. 262-263.

[75]Thomas C. Boyle, "Beverly Enterprises: From David to Goliath in Long Term Care," *The Consultant Pharmacist*, Vol. 2, January/ February 1987, pp. 33-42.

[76]Christine E. Bishop, p. 50.

Birnbaum, et al., concluded that the effect of facility size is minimally important in determining overall cost variation. They found that size only showed effects over the lowest census range, and even these effects were very small-scale. They stated that "average costs were found to fall initially as the bed size increases to about 40 beds, costs were not related to size beyond that level."[77] Arling, Nordquist and Capitman also concluded that the bed size of the facility is insignificant in predicting its overall operating costs.[78]

Although not all of the variables reviewed show significant results in all studies, there is enough evidence to warrant an inspection of their relationship to the evaluative criteria used by pharmaceutical services committee members in selecting pharmaceutical services for nursing home residents. The studies examining bed size and ownership type of facilities have dealt mainly with the effect of the Administrator's economic decisions on the overall operating costs of the facility. The main emphasis of this study is to integrate economic, therapeutic and organizational objectives to arrive at the criteria which are used by the pharmaceutical services committee, not just the administration of a facility.

In summary, the problem previously identified has four basic steps. First, how important are the criteria gathered from the

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[77]Howard Birnbaum, et al., p. 1097.

[78]Greg Arling, Richard H. Nordquist and John A. Capitman, p. 263.

literature review to the pharmaceutical services committee members in making their decision for selecting pharmaceutical services for the long term care facility? Second, what are the differences among the categories of committee members relating to the importance placed on the evaluative criteria? Third, what are the differences among the pharmaceutical services committee members from facilities of different ownership types relating to the importance they place on the evaluative criteria? And fourth, what are the differences among the pharmaceutical services committee members from facilities of different bed sizes relating to the importance they place on the evaluative criteria?

CHAPTER 3
OBJECTIVES AND HYPOTHESES

An exploratory study was conducted to gain insight into what factors are important to pharmaceutical services committee members for selecting pharmaceutical services in a Skilled Nursing Facility. The objectives are to: (1) determine the importance of selected general criteria used by pharmaceutical services committee members in selecting Vendor and Consultant Pharmacists' services in Skilled Nursing Facilities in Wisconsin; (2) assess if differences exist among the categories of committee members as to which general criteria were deemed to be most important; (3) assess if differences exist among pharmaceutical services committee members from facilities of different ownership types as to which general criteria were deemed to be most important; (4) assess if differences exist among pharmaceutical services committee members from facilities of different bed size categories as to which general criteria were deemed to be most important; and (5) explore the respondents' rating of relative importance of individual elements for each of the general criteria.

The null hypotheses to be tested for this study are:

H_1: There is no difference in the importance of the general evaluative criteria used in selecting the Vendor Pharmacist's services for a Skilled Nursing Facility among the categories of pharmaceutical services committee members.

H_2: There is no difference in the importance of the general evaluative criteria used in selecting the Consultant Pharmacist's services for a Skilled Nursing Facility among the categories of pharmaceutical services committee members.

H_3: There is no difference in the importance of the general evaluative criteria used in selecting the Vendor Pharmacist's services for a Skilled Nursing Facility among pharmaceutical services committee members from facilities of different ownership types.

H_4: There is no difference in the importance of the general evaluative criteria used in selecting the Consultant Pharmacist's services for a Skilled Nursing Facility among pharmaceutical services committee members from facilities of different ownership types.

H_5: There is no difference in the importance of the general evaluative criteria used in selecting the Vendor Pharmacist's services for a Skilled Nursing Facility among pharmaceutical services committee members from facilities of different bed size categories.

H_6: There is no difference in the importance of the general evaluative criteria used in selecting the Consultant Pharmacist's services for a Skilled Nursing Facility among pharmaceutical services committee members from facilities of different bed size categories.

CHAPTER 4
METHODS

A mail survey research methodology was used to accomplish the objectives. This method was chosen over other methods such as personal interview or focus group methods primarily because it was a more timely and cost-effective means of gathering approximately the same amount of information.[1] The mail survey method was preferred over the telephone interview method because of the unavailability of a complete list of telephone numbers for some of the pharmaceutical services committee members, such as the Consultant Pharmacist and the Medical Director.

Operational Definitions

For the purposes of this project, the following operational definitions were chosen. The Vendor Pharmacist was defined as the pharmacist whose responsibilities and experiences include dispensing medications to nursing home residents. The Consultant Pharmacist was defined as the pharmacist responsible for monitoring and ensuring quality pharmaceutical services to nursing home residents. Also, for the purposes of data analysis, the following subgroups were established. The four subgroups established for pharmaceutical

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[1]Don A. Dillman, *Mail and Telephone Surveys: The Total Design Method*, John Wiley & Sons, New York, 1978, pp. 68-72.

services committee membership corresponded to the four different types of members: Administrator, Consultant Pharmacist, Director of Nursing and Medical Director. The ownership classifications are: governmental (Federal, State, County, City or City/County), voluntary nonprofit (Corporation, Church, Association, or Church/Corporation) and proprietary (Individual, Partnership or Corporation). However, throughout the thesis the voluntary nonprofit and proprietary categories also will be referred to as nonprofit and for-profit, respectively. The bed size classifications are: less than 100, 100 to 200 and greater than 200.

The physician chosen for the study was the Medical Director of the facility. This was done for two reasons: First, from personal experience it is known that the Medical Director is usually the physician who is a member of the committee. Second, if the Medical Director is not the member of the committee, s/he is the easiest physician in a facility to contact, and it was thought that this would at least represent <u>one</u> physician's opinion.

The definition of long term care facility for this study was limited to only those facilities certified (at least in part) as Skilled Nursing Facilities. This also was done for two reasons: First, since the Medical Director was to satisfy the definition of a physician, the definition of the facility had to be limited, because in Intermediate Care Facilities the Medical Director can be a Registered Nurse. Second, this eliminated any differences that may have resulted from

the differing levels of care, since it was not part of the objectives to examine these differences.

Instrument Development

After deciding on the mail survey methodology, it also was decided that the criteria deemed important for recommending pharmaceutical services would be presented in the instrument in an acceptable format. The instrument developed was based on: (1) the criteria gathered from the studies discussed in the literature review, (2) Federal and State Medicare and Medicaid regulations relating to long term care facilities, (3) criteria deemed important from discussions with colleagues, and (4) criteria gathered from personal experience in the long term care area. The general criteria will be presented after a short discussion of the options considered for the format of the instrument.

There were five basic options considered for the format of the instrument. Option One was to divide the evaluative criteria into similar but different groups and have the respondents rate the importance of the evaluative criteria using a Likert-type scale, and also ask them to rank what they believe to be the three most important criteria in each group. A major disadvantage of this option is that the a priori classification may be different than that of the respondent's, thereby distracting the respondent. Option Two was to divide the evaluative criteria into groups of five or ten and have the

respondents divide 100 points among the group based upon their belief of the importance of the criteria. In addition to the disadvantages of option One, this option also has the disadvantage that the criteria may not be arranged easily into either a group of five or ten per criteria.

Option Three was to present all of the evaluative criteria as positively worded statements and have the respondents rate the importance of each using a Likert-type scale. The disadvantage of this option was that the instrument would become too long for the respondents to complete. Option Four was to present the criteria and have the respondents perform an importance ranking for the entire list of statements. Again, it was thought the form would be too long to complete because of the fatigue factor.

Option Five was to have the respondents categorize the criteria according to their perceptions and then rank the criteria within the categories. However, this option was subject to identifying incorrectly the proper a priori category headings, or the possible misinterpretation of the category headings by the respondents.

The format option decided on was a hybrid of option Two and option Four. The criteria would be categorized into groups of five where possible, then respondents would be asked to rank the criteria within each group in order of importance for selecting pharmaceutical services. Where the criteria did not lend themselves to this type of ranking, the respondents were asked to choose the most important criteria from among the group. Also, each of the groups of criteria

were labelled as general factors corresponding to their content. Respondents were asked to rank each of the general factors in order of importance when selecting pharmaceutical services. It was hoped that this method would result in a greater variance among the mean ranks. Using this method would eliminate the disadvantage of choosing the proper general factor labels because respondents could always refer back to the group to determine what was actually meant by the general factor. However, the disadvantage of the form being rather lengthy still was present.

Criteria for the Vendor Pharmacist were arranged into eight general factors and labelled: location, distribution system, administrative factor, dispensing factor, pharmacy practice setting, regulatory factor, experience factor and delivery factor. Criteria for the Consultant Pharmacist were categorized into seven general factors and labelled: experience factor, auxiliary factor, regulatory factor, administrative factor, clinical factor, pharmacy practice setting and location. Five of the general factors for both the Vendor and Consultant Pharmacist contained five descriptive elements. For the Vendor Pharmacist these factors were the administrative, dispensing, regulatory, experience and delivery factors. For the Consultant Pharmacist, the factors containing five descriptive elements were the experience, auxiliary, regulatory, administrative and clinical factors.

Respondents were asked to rank the elements of the factors which contained five elements using the ranking scale 1 = most

important through 5 = least important. For the other three factors under Vendor pharmacist (location, distribution system and pharmacy practice setting), and two factors under Consultant Pharmacist (location and pharmacy practice setting), respondents were asked to choose only the most important element of those listed. A copy of the pretest instrument, listing all the general factors and their elements is in Appendix A.

The elements were ordered randomly within each factor and the factors also were ordered randomly in the instrument. At the end of each section for the Vendor and Consultant Pharmacists, the respondents were asked to rank the importance of the general factors in that section using the scales 1 = most important through 8 = least important and 1 = most important through 7 = least important, respectively. There were other questions in the instrument concerning the Vendor and Consultant Pharmacists' provision of services and demographic variables (category of Pharmaceutical Services Committee membership, years' experience in the category of Pharmaceutical Services Committee membership, years' experience with nursing homes, age and gender). There also were two questions for the Director of Nursing, one asked the number of years the respondent had worked with the current distribution system in their nursing home; and the other asked if the Vendor and Consultant Pharmacist were the same person in their nursing home. A cover letter was written to accompany the instrument. Both the cover letter and the instrument

were photocopied and arranged into an eight-page booklet.

Pretest

The instrument was pretested on pharmaceutical services committee members from 12 randomly chosen SNFs geographically dispersed throughout Wisconsin. Names and addresses of the committee members were obtained by making a telephone call to the Administrator of each SNF. A packet was mailed to each committee member. Each packet contained the eight-page booklet with a fifty-cent token attached, and a return addressed, postage-paid envelope.

A response rate of approximately 61 percent was obtained. The responses were analyzed only for problems in the content or wording of the instrument. From the pretest responses it was noted that clarification was needed in the explanation of the rating scale, therefore changes were made to instruct the respondents to use the rating scale 1 = most important through 5 = fifth most important, 1 = most important through 8 = eighth most important, or 1 = most important through 7 = seventh most important where appropriate. Also, a sentence was added instructing the respondents to use each number once for each ranking procedure. The only other major change was to delete the two questions for the Director of Nursing. This was done because the responses from these questions could not be linked in a logical manner to the rest of the data analysis, and therefore would not be used. The cover letter was included with the

instrument and it again was arranged into a booklet to be photocopied. A copy of the final booklet is in Appendix B.

Data Collection

Prior to mailing the booklet to the chosen sample, letters were sent to people who were believed to be influential to the nursing home industry in the State of Wisconsin. The letters were sent to inform them of the nature of the study because of the sensitive nature of collecting information in the nursing home environment. Copies of the letters sent are in Appendix C.

The booklet was mailed on 13 July 1987 to a systematic random sample of 560 pharmaceutical services committee members from 140 SNFs located throughout Wisconsin. For this mailing, the names and addresses of the facilities and the names of the Administrators were obtained from a list supplied by the Wisconsin Bureau of Quality Compliance. To prepare the list of long term care facilities for the sampling procedure, it first was scrutinized to eliminate those facilities which were not certified as Skilled Nursing Facilities. Next, 82 facilities were removed from the sample because they were being utilized in another research project and the researchers requested that the facilities not be included in this study. After this was done, all facilities were placed into one of nine categories based on the geographic location of the facility. These lists then were organized alphabetically and after a random start (determined by a random

number generator), every second facility was chosen for the sample.

All booklets were mailed in individual packets to the facility, addressed with the Administrator's name or the title Consultant Pharmacist, Director of Nursing or Medical Director, respectively. Again, the packet contained the booklet with a fifty-cent token attached, and a return addressed, postage-paid envelope. The ownership type and the bed size of the facility in which the respondent was located, as determined from the list supplied by the Wisconsin Bureau of Quality Compliance, were coded on the return envelope.

A follow-up postcard reminder was mailed to the entire sample on 20 July 1987, one week after the packets were mailed. A copy of the postcard is in Appendix D. Since there was the possibility of infrequent visits to the facility by either the Consultant Pharmacist or the Medical Director, returns were accepted up to 21 September 1987, ten weeks from the date of mailing.

Data Analysis

The responses were coded into an acceptable format for use on an electronic data processing system. A copy of the coding format is in Appendix E. The Statistical Package for the Social Sciences-X was used for conducting all statistical tests.[2] The conventional alpha $\leq$

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[2]SPSS Inc., *SPSS^X User's Guide*, McGraw-Hill Book Company, Suite 3000, 444 North Michigan Avenue, Chicago, IL 60611, 1983.

0.05 level of significance was chosen for determining the significance of all tests performed.

Initially the data were analyzed by calculating frequencies and mean ranks of all the general factors to place them in order of overall importance. Frequencies and mean ranks also were calculated for all of the general factors within the committee membership, ownership type and bed size classifications. The mean ranks of the general factors for each subgroup classification were analyzed with the Kruskal-Wallis test. The Kruskal-Wallis test is the nonparametric counterpart to the one way analysis of variance, and must be used in this case because of the ranking method used.

The Kruskal-Wallis test only determines that a difference occurs for the mean factor ranking among the subgroups of a given classification, it does not determine between which levels of the independent variable the difference occurs. Therefore, all Kruskal-Wallis tests significant at alpha $\leq$ 0.05 were subjected to Mann-Whitney U tests to determine between which levels of the variable the difference was significant. The Mann-Whitney U test is the suggested follow-up test to the Kruskal-Wallis test. It is one of the nonparametric alternatives to the t-test, and is a more powerful alternative than the median test.[3]

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[3]Schuyler W. Huck, William H. Cormier and William G. Bounds, Jr., *Reading Statistics and Research*, Michael E. Brown (ed.), Harper & Row Publishers, New York, 1974, p. 209-216.

A similar method was used to analyze the responses for the individual elements of each of the general factors. Element frequencies and mean ranks were calculated to place the elements in order of overall importance within each of the general factors. Frequencies and mean ranks also were calculated for the individual elements within the committee membership, ownership type and bed size classifications. Kruskal-Wallis tests were conducted on the mean ranks to determine where differences occurred within the subgroup classifications. The Mann-Whitney U test then was conducted to determine between which levels of the variable the difference was significant.

For those individual elements of the general factors that the respondents were asked to choose only one element of those listed, the Kruskal-Wallis test could not be performed, therefore a crosstabulation was performed and the two sample chi-square statistic was calculated. This was done to determine if the proportion of an element chosen by a subgroup within a classification was significantly different than the proportion chosen by any of the other subgroups within that classification. Since the chi-square test will have a distorted value if any of the expected cell frequencies is less than five, it was not possible to perform this procedure in all cases.[4] However, in some cases the categories could be regrouped to eliminate

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[4]Schuyler W. Huck, William H. Cormier and William G. Bounds, Jr., p. 219.

cells with expected frequencies of less than five. For example, the ownership categories of nonprofit and governmental could be regrouped into one category. This grouping method has been used in previous research in the nursing home environment.[5,6,7]

Limitations

Some limitations of the study are: First, since the sample for this study was only the SNFs in the State of Wisconsin, care should be taken not to generalize the results nationally. A much larger study with a more nationally dispersed sample would have to be undertaken before the results could be generalized.

Second, it is possible that not all of the evaluative criteria used by pharmaceutical services committee members in making the decision for selecting pharmaceutical services have been identified. If other more important criteria have been excluded, the mean ranks, and thereby the overall ranks assigned to the criteria in this study are not representative. Also, the assignment of the individual elements to the general factors in this study may not have been representative of how the committee members would have classified them. This would have influenced the mean ranks assigned to both the individual elements and

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[5]Christine E. Bishop, pp. 47-64.

[6]Howard Birnbaum, et al., pp. 1095-1107.

[7]Greg Arling, Richard H. Nordquist and John A. Capitman, pp. 255-269.

the general factors.

Third, since the data are ranked data, this severely limits the types of statistical procedures which can be performed on them. Nonparametric analyses must be performed on this type of data because the assumptions of parametric statistics are not valid. If the ranking scale had not been used, statistical tests may have uncovered the effect of interactions among the committee membership, ownership type and bed size variables.

Fourth, the data for the comparisons of facilities of the same ownership type or bed size are pooled data. This means that the responses for the pharmaceutical services committee members for a particular facility were not separated and analyzed, and therefore the common frame of reference for members from the same facility was eliminated.

Finally, since the packets were sent to the pharmaceutical services committee members at their given facility, it is possible that more than one or all of the booklets for a facility were completed by the same individual. If this was done, the mean ranks assigned to the criteria would be distorted.

CHAPTER 5
RESULTS

All packets were assumed to be delivered since none were returned as undeliverable. By the end of the tenth week, 264 responses were received from the 560 packets mailed, for an overall response rate of 47.1 percent. Three booklets were unusable because the majority of the questions were left unanswered. Thus, 261 usable responses were used in data analysis.

The respondents ranged in age from 21 to 77 years old; had from one to 40 years of experience with long term care facilities in general; and had from one to 30 years of experience in the job in which they were employed now. A slight majority of the respondents were male (52.3%).

Table 1 shows the response rate by the position at the facility. The column on the left gives the response rate for the different positions at the facility, and the column on the right gives the response rate as a percentage of all respondents. As can be seen from the table, the Directors of Nursing had the highest response rate, and the Medical Directors had the lowest response rate. Table 2 contains the response rate by the ownership type of the respondent's facility. The governmental facilities appear to be over-represented if compared to their actual prevalence throughout the State of Wisconsin. Table 3 represents the response rate by the bed size category into

TABLE 1

RESPONSE RATE BY POSITION AT SKILLED NURSING FACILITY

Position	**Percentage by position**[a]	**Percentage of respondents**[b]
Administrator	55.7	30.0
Consultant Pharmacist	41.4	22.3
Director of Nursing	64.3	34.6
Medical Director	24.3	13.1
Total		100.0

[a]N=140
[b]N=261

TABLE 2

RESPONSE RATE BY OWNERSHIP TYPE OF SKILLED NURSING FACILITY

Ownership Type	**Percentage in State**[a]	**Percentage of respondents**[b]
Nonprofit	36.1	35.2
For-Profit	47.0	39.8
Governmental	16.9	24.9
Total	100.0	99.9[c]

[a]N=402
[b]N=261
[c]Totals < 100% due to effects of rounding

TABLE 3

RESPONSE RATE BY BED SIZE CATEGORY OF SKILLED NURSING FACILITY

Bed Size Category	**Percentage in State**[a]	**Percentage of respondents**[b]
Less than 100	44.8	41.8
100 to 200	40.8	42.9
Greater than 200	14.4	15.3
Total	100.0	100.0

[a]N=402
[b]N=261

which the respondent's facility was classified. It appears that the distribution of respondents by bed size category is very close to the distribution of facilities in the State of Wisconsin.

The rest of the results will be presented in four sections: overall sample, committee member classification, ownership type classification, and bed size category classification. Each of the sections will contain two parts, one relating to the Vendor Pharmacist factors, and one relating to the Consultant Pharmacist factors. The null hypotheses will be tested in each section as necessary.

Overall Sample

Vendor Factors

For the overall sample, Table 4 presents the overall rank, mean rank and number of respondents ranking a factor as number one in importance for each of the eight general Vendor Pharmacist factors. As can be seen from the table, the distribution system had the highest mean rank at 3.23. The experience factor is second most important overall with a mean rank of 3.60, and 66 respondents ranking it as most important. Other important points from Table 4 are: the dispensing factor also has a mean rank of less than 4.00, and the practice setting of the Vendor Pharmacist is the least important general factor with a mean rank of 6.04 and only 11 respondents ranking it as most important.

The respondents were presented with three alternatives for the

TABLE 4

VENDOR PHARMACIST CRITERIA FACTOR RANKINGS

Factor	Overall Rank	Mean Rank[a]	Frequency of #1 Rank
Distribution System	1	3.23	65
Experience Factor	2	3.60	66
Dispensing Factor	3	3.80	29
Delivery Factor	4	4.07	29
Regulatory Factor	5	5.00	15
Location	6	5.03	27
Administrative Factor	7	5.20	18
Practice Setting	8	6.04	11
Total			260[b]

[a]Ranking Scale: 1=Most Important to 8=Eighth Most Important
[b]Totals 260 due to nonresponse

distribution system general factor and were asked to choose which system they would prefer the Vendor Pharmacist to provide to their facility. The unit-dose system (unit-of-use) was preferred by 46.7 percent; the modified traditional drug delivery system (defined as tablets and capsules in unit-dose, with liquids and ointments in bulk supply) was preferred by 39.8 percent; and the traditional drug delivery system (Rx vial) was preferred by 13.5 percent of the respondents. The individual elements of the seven other general Vendor Pharmacist factors, with either the overall respondent's mean ranking for the elements of the factor or a ranking by frequency of response are in Appendix F.

Consultant Factors

In Table 5, the seven Consultant Pharmacist general factors are presented with their overall rank, mean rank and number of respondents ranking the factor as most important. The experience factor was ranked most important overall for the Consultant Pharmacist, with a mean rank of 2.45 and 108 respondents ranking it as most important. The clinical factor also had a mean rank of less than 3.00, however only 49 respondents ranked it most important overall. Another important point from Table 5 is that the least important factor includes a grouping of the practice setting, auxiliary factor and location of the Consultant Pharmacist.

Since the experience factor was most important among the Consultant Pharmacist general factors, the individual elements that

TABLE 5

CONSULTANT PHARMACIST CRITERIA FACTOR RANKINGS

Factor	Overall Rank	Mean Rank[a]	Frequency of #1 Rank
Experience Factor	1	2.45	108
Clinical Factor	2	2.93	49
Regulatory Factor	3	3.37	44
Administrative Factor	4	3.63	28
Practice Setting	5	5.06	7
Auxiliary Factor	6	5.12	4
Location	7	5.41	13
Total			253[b]

[a]Ranking Scale: 1=Most Important to 7=Seventh Most Important
[b]Totals 253 due to nonresponse

composed this factor are presented. Table 6 lists the elements of this factor, their mean rank and the number of respondents ranking the element as most important for this general factor. Prior experience with a Consultant Pharmacist was the most important element of the Consultant Pharmacist experience factor elements. The individual elements for the six other general Consultant Pharmacist factors, with either the overall respondent's mean ranking for the elements of a factor or a ranking by frequency of response are presented in Appendix G.

Committee Member Classification

Vendor Factors

Table 7 presents the mean ranking by the categories of committee members for each of the eight general Vendor Pharmacist factors. Kruskal-Wallis tests conducted on the eight general Vendor Pharmacist factors revealed that a significant difference occurred among the categories of committee members for the mean rank of the distribution system and the regulatory factor. From Table 7 it is seen that the Consultant Pharmacists and the Directors of Nursing ranked the distribution system significantly more important than did the Medical Directors. Also, Table 7 shows that the Administrators and the Directors of Nursing ranked the regulatory factor significantly more important than did the Consultant Pharmacists and the Medical Directors.

TABLE 6

OVERALL RESPONDENTS' PREFERENCE FOR CONSULTANT EXPERIENCE FACTOR ELEMENTS

Factor Element	Mean Rank[a]	Frequency of Most Important Rank
Prior Experience with Consultant	1.81	138
Recommended by Other Health Care Professionals	2.35	63
Recommended by Other Committee Members	2.82	25
Active in Professional Organizations	3.37	28
Post-Graduate Degree	4.64	4
Total		258[b]

[a]Ranking Scale: 1=Most Important to 5=Fifth Most Important
[b]Totals 258 due to nonresponse

TABLE 7

MEAN RANK[a] OF GENERAL VENDOR FACTORS BY POSITION

	GENERAL FACTORS															
	Distribution System		Experience Factor		Dispensing Factor		Delivery Factor		Regulatory Factor		Location		Administrative Factor		Practice Setting	
Position	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Administrator	78	3.33	78	3.50	78	3.91	78	4.09	78	4.50[d,e]	77	5.55	78	5.03	77	6.07
Consultant Pharmacist	58	2.85[b]	57	3.47	58	4.17	57	4.35	58	5.76[d,f]	58	4.74	58	4.86	58	5.85
Director of Nursing	90	3.08[c]	90	3.92	90	3.54	89	3.76	90	4.66[f,g]	90	4.99	90	5.63	89	6.35
Medical Director	32	4.06[b,c]	32	3.09	32	3.66	32	4.34	32	5.75[e,g]	32	4.53	32	4.97	32	5.59

[a]Ranking Scale: 1=Most Important to 8=Eighth Most Important

Mann-Whitney U tests
[b,d,e,f,g]significantly different at alpha $\leq$ 0.01
[c]significantly different at alpha $\leq$ 0.05

These results pertain to the first null hypothesis: there is no difference in the importance of the general evaluative criteria used in selecting the Vendor Pharmacist's services for a Skilled Nursing Facility among the categories of pharmaceutical services committee members. Based upon the results of the Kruskal-Wallis tests on the general Vendor Pharmacist factors the decision is to reject the first null hypothesis.

The individual elements within the eight general Vendor Pharmacist factors also were analyzed to determine if differences in importance occurred among the categories of committee members. The Kruskal-Wallis tests showing a significant difference among the categories of committee members for the mean ranking of the individual elements are presented in the Tables in Appendix H. The Kruskal-Wallis tests detected a significant difference among the categories of committee members for the mean ranking of: the administrative factor elements of participation on the Utilization Review Committee and establishing a restricted formulary, the experience factor elements of prior experience, active in professional organizations and post-graduate degree, the delivery factor elements of on-call services and pharmacy owned vehicle, and the dispensing factor elements of checking on appropriate storage of drugs and answering medication storage questions.

A significant Chi-square result showing the different preferences for a distribution system by the categories of committee members also

is presented in Appendix H, however this should be interpreted with caution since one of the 12 cells in this table had an expected frequency of less than five. None of the other Chi-square tests performed for Vendor Pharmacist factor elements were significant.

Consultant Factors

Table 8 presents the mean ranking by the categories of committee members for each of the seven general Consultant Pharmacist factors. The Kruskal-Wallis tests detected a significant difference among the categories of committee members for the mean rank of the regulatory, clinical and administrative factors. It is shown in Table 8 that the Administrators ranked the regulatory factor more important than did both the Consultant Pharmacists and the Medical Directors, and the Directors of Nursing ranked the regulatory factor more important than did the Medical Directors. Table 8 also shows that the Administrators and the Consultant Pharmacists ranked the administrative factor more important than did the Directors of Nursing. Another significant difference from Table 8 is that the Consultant Pharmacists ranked the clinical factor more important than did the Administrators.

These results pertain to the second null hypothesis: there is no difference in the importance of the general evaluative criteria used in selecting the Consultant Pharmacist's services for a Skilled Nursing Facility among the categories of pharmaceutical services committee members. Based upon the results of the Kruskal-Wallis tests on the

TABLE 8

MEAN RANK[a] OF GENERAL CONSULTANT FACTORS BY POSITION

	GENERAL FACTORS													
	Experience Factor		Clinical Factor		Regulatory Factor		Adminis-trative Factor		Practice Setting		Auxiliary Factor		Location	
Position	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Administrator	75	2.44	74	3.39[b]	74	2.95[c,d]	75	3.48[f]	75	5.20	75	4.95	75	5.63
Consultant Pharmacist	57	2.60	57	2.53[b]	57	3.70[c]	57	3.14[g]	56	5.05	56	5.18	56	5.73
Director of Nursing	90	2.40	90	2.87	90	3.20[e]	90	4.06[f,g]	90	5.07	90	5.22	90	5.18
Medical Director	31	2.29	30	2.70	30	4.23[d,e]	30	3.67	30	4.77	30	5.17	30	5.10

[a]Ranking Scale: 1=Most Important to 7=Seventh Most Important

Mann-Whitney U tests

[b,c,d,e,g]significantly different at alpha $\leq$ 0.01

[f]significantly different at alpha $\leq$ 0.05

general Consultant Pharmacist factors the decision is to reject the second null hypothesis.

Differences also were found among the categories of committee members for the mean ranks of some of the individual elements within the Consultant Pharmacist factors. The Kruskal-Wallis tests showing a significant difference in the importance of the individual elements among the categories of committee members are presented in Tables in Appendix I. The Kruskal-Wallis tests detected significant differences among the categories of pharmaceutical services committee members for the mean ranking of: the auxiliary factor elements of record-keeping activities and answering medication storage questions, the regulatory factor elements of supervising maintenance of the appropriate controlled substances records, checking on the appropriate storage of drugs and monthly medication reviews, the administrative factor elements of participation on the Pharmaceutical Services Committee and the Infection Control Committee, the clinical factor elements of answering patient therapy questions, consulting with the attending physician, accompanying the physician on patient rounds and obtaining medication histories, and the experience factor elements of recommended by other health care professionals and post-graduate degree. The Chi-square tests performed for the individual Consultant Pharmacist factor elements were either insignificant or contained too many cells with an expected frequency of less than five.

Ownership Type Classification

Vendor Factors

Table 9 presents the mean ranking for each of the eight general Vendor Pharmacist factors by the pharmaceutical services committee members from the facilities of different ownership types. The Kruskal-Wallis tests conducted on the general Vendor Pharmacist factors revealed that a significant difference occurred among the committee members from the different ownership types for the practice setting of the Vendor Pharmacist. Table 9 shows that the committee members from the governmental category ranked the practice setting of the Vendor Pharmacist significantly more important than did the committee members from the for-profit category.

These results pertain to the third null hypothesis: there is no difference in the importance of the general evaluative criteria used in selecting the Vendor Pharmacist's services for a Skilled Nursing Facility among pharmaceutical services committee members from facilities of different ownership types. Based upon the results of the Kruskal-Wallis tests on the general Vendor Pharmacist factors the decision is to reject the third null hypothesis.

Tests performed for the individual elements within the Vendor Pharmacist factors also revealed differences in the mean ranking among the pharmaceutical services committee members from the different ownership types. The significant Kruskal-Wallis tests for the individual elements by the pharmaceutical services committee members

TABLE 9

MEAN RANK[a] OF GENERAL VENDOR FACTORS BY OWNERSHIP TYPE

	GENERAL FACTORS															
	Distribution System		Experience Factor		Dispensing Factor		Delivery Factor		Regulatory Factor		Location		Administrative Factor		Practice Setting	
Position	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Nonprofit	91	3.17	90	3.64	91	3.64	90	4.38	91	5.20	91	5.13	91	4.80	91	6.08
For-Profit	103	3.28	103	3.50	103	3.72	102	3.65	103	5.02	103	4.78	103	5.55	102	6.44[b]
Governmental	65	3.23	65	3.71	65	4.17	65	4.31	65	4.71	64	5.28	65	5.20	64	5.36[b]

[a]Ranking Scale: 1=Most Important to 8=Eighth Most Important

Mann-Whitney U tests

[b]significantly different at alpha $\leq$ 0.01

from the different ownership types are presented in Tables in Appendix J. The Kruskal-Wallis tests detected significant differences for the mean ranking of: the regulatory factor elements of weekly home visits and establishing an automatic stop-order policy, the delivery factor element of on-call services, the dispensing factor elements of checking for appropriate storage of drugs and preparing sterile IV solutions.

A significant Chi-square test showing differences in the preference for a distribution system by the pharmaceutical services committee members from the different ownership types also is presented in Appendix J. For this Chi-square test, the ownership categories of nonprofit and governmental were grouped together to avoid cells with expected frequencies of less than five.

Consultant Factors

Table 10 presents the mean ranking for each of the seven general Consultant Pharmacist factors by the pharmaceutical services committee members from the different ownership types. No significant differences were found with the Kruskal-Wallis test among the pharmaceutical services committee members from different ownership types for the general Consultant Pharmacist factors.

These results pertain to the fourth null hypothesis: there is no difference in the importance of the general evaluative criteria used in selecting the Consultant Pharmacist's services for a Skilled Nursing Facility among pharmaceutical services committee members from

TABLE 10

MEAN RANK[a] OF GENERAL CONSULTANT FACTORS BY OWNERSHIP TYPE

	GENERAL FACTORS											
	Experience Factor		Clinical Factor		Regulatory Factor		Administrative Factor		Practice Setting		Auxiliary Factor		Location	
Position	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Nonprofit	88	2.39	87	2.91	87	3.69	86	3.54	87	4.90	86	5.23	87	5.29
For-Profit	104	2.25	103	3.11	103	3.18	104	3.81	103	5.18	103	5.01	103	5.39
Governmental	62	2.86	62	2.68	62	3.21	62	3.47	62	5.07	62	5.08	62	5.61

[a]Ranking Scale: 1=Most Important to 7=Seventh Most Important

facilities of different ownership types. Based upon the results of the Kruskal-Wallis tests on the general Consultant Pharmacist factors the decision is not to reject the fourth null hypothesis.

The Kruskal-Wallis tests conducted on the individual elements within the factors failed to reveal any significant differences in the mean ranking by the pharmaceutical services committee members from the different ownership types. The Chi-square tests conducted also did not show any significant differences in the preferences for the individual elements among the pharmaceutical services committee members from the different ownership types.

Bed Size Category Classification

Vendor Factors

Table 11 presents the mean ranking for each of the eight general Vendor Pharmacist factors by the pharmaceutical services committee members from the different bed size categories. Kruskal-Wallis tests conducted on the general Vendor Pharmacist factors revealed a significant difference among the pharmaceutical services committee members from the different bed size categories for the dispensing factor. Table 11 shows that the committee members from the 100 to 200 bed category ranked the dispensing factor more important than did the committee members from the other two categories.

These results pertain to the fifth null hypothesis: there is no difference in the importance of the general evaluative criteria used in

TABLE 11

MEAN RANK[a] OF GENERAL VENDOR FACTORS BY BED SIZE

	GENERAL FACTORS															
	Distri-bution System		Experience Factor		Dispensing Factor		Delivery Factor		Regulatory Factor		Location		Adminis-trative Factor		Practice Setting	
Position	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Less than 100	108	3.50	107	3.43	108	3.99[b]	106	3.97	108	5.03	108	4.79	108	5.19	107	6.08
100 to 200	111	3.01	111	3.87	111	3.46[b,c]	111	4.14	111	5.03	110	5.14	111	5.26	110	6.05
Greater than 200	40	3.10	40	3.33	40	4.25[c]	40	4.13	40	4.88	40	5.38	40	5.05	40	5.93

[a]Ranking Scale: 1=Most Important to 8=Eighth Most Important

Mann-Whitney U tests

[b,c]significantly different at alpha $\leq$ 0.05

selecting the Vendor Pharmacist's services for a Skilled Nursing Facility among pharmaceutical services committee members from facilities of different bed size categories. Based upon the results of the Kruskal-Wallis tests on the general Vendor Pharmacist factors the decision is to reject the fifth null hypothesis.

The individual elements within the general Vendor Pharmacist factors also were analyzed to determine if differences occurred among the pharmaceutical services committee members from different bed size categories. The significant Kruskal-Wallis test results for the individual elements are presented in the Tables in Appendix K. The Kruskal-Wallis tests detected significant differences for the mean ranking of: the regulatory factor elements of establishing a stop-order policy and participation on the Pharmaceutical Services and Infection Control Committees, and the delivery factor element of pharmacy owned vehicle.

The Chi-square tests also found differences for the individual elements among the pharmaceutical services committee members from the different bed size categories for the distribution system and the location of the Vendor Pharmacist. These significant test results also are presented in Appendix K. When necessary, to eliminate cells with an expected frequency of less than five, the bed size categories and the location categories were regrouped. For the Vendor practice setting, the results were significant, however after regrouping there were still too many cells with an expected frequency of less than five.

Consultant Factors

Table 12 presents the mean ranking for each of the seven general Consultant Pharmacist factors by the pharmaceutical services committee members from the different bed size categories. The mean rank of the clinical factor, practice setting and location of the Consultant Pharmacist were found to be significantly different among the pharmaceutical services committee members from the different bed size categories using the Kruskal-Wallis test. Table 12 shows the committee members from the greater than 200 beds category ranked the clinical factor more important than did the committee members from the less than 100 beds category. Table 12 also shows that the practice setting of the Consultant Pharmacist is more important to the committee members from the less than 100 beds category than it is to the committee members from the 100 to 200 beds category. It is also shown in Table 12 that the committee members from the less than 100 beds category ranked the location of the Consultant Pharmacist more important than did the committee members from the other two categories.

These results pertain to the sixth null hypothesis: there is no difference in the importance of the general evaluative criteria used in selecting the Consultant Pharmacist's services for a Skilled Nursing Facility among pharmaceutical services committee members from facilities of different bed size categories. Based upon the results of the Kruskal-Wallis tests on the general Consultant Pharmacist factors

TABLE 12

MEAN RANK[a] OF GENERAL CONSULTANT FACTORS BY BED SIZE

	GENERAL FACTORS													
	Experience Factor		Clinical Factor		Regulatory Factor		Adminis-trative Factor		Practice Setting		Auxiliary Factor		Location	
Position	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Less than 100	104	2.57	104	3.21[b]	105	3.46	104	3.73	104	4.77[c]	104	5.21	104	5.03[d,e]
100 to 200	111	2.33	109	2.82	109	3.23	109	3.52	109	5.39[c]	108	5.03	109	5.62[d]
Greater than 200	39	2.44	39	2.51[b]	39	3.49	39	3.67	39	4.90	39	5.15	39	5.85[e]

[a]Ranking Scale: 1=Most Important to 7=Seventh Most Important

Mann-Whitney U tests
[b,c,d,e]significantly different at alpha $\leq$ 0.05

the decision is to reject the sixth null hypothesis.

The individual elements of the general Consultant Pharmacist factors also were ranked significantly different by the pharmaceutical services committee members from the different bed size categories. The results of the Kruskal-Wallis tests showing significant differences for the mean ranks of the individual elements by the pharmaceutical services committee members from the different bed size categories are presented in Tables in Appendix L. The Kruskal-Wallis tests detected significant differences for the mean ranking of: the administrative factor element of quarterly written reports, and the experience factor element of post-graduate degree. A significant Chi-square test showing the preference for the Consultant Pharmacist's location by the pharmaceutical services committee members from the different bed size categories also is presented in Appendix L. For the Consultant practice setting, the Chi-square test was significant, however the categories could not be regrouped to eliminate enough cells with an expected frequency of less than five.

CHAPTER 6
DISCUSSION

This chapter will be presented in four sections corresponding to the four sections of the results chapter. First, the results for the overall sample will be discussed, followed by the differences in importance of the evaluative criteria found among the categories of committee members. Then the differences in importance of the evaluative criteria found among the pharmaceutical services committee members from different ownership types will be discussed. Finally, the differences in importance of the evaluative criteria found among pharmaceutical services committee members from different bed size categories will be discussed. In all of the sections analyzing differences in importance of the evaluative criteria among categories for a specific variable, special attention will be taken to note whether a tendency appears in the results. The discussion of tendencies will be based upon both the information presented in the results section and supporting information contained in the Appendices.

Overall Sample

The distribution system the Vendor Pharmacist supplies to a facility, in particular the unit-dose system, is the most important factor in selecting a Vendor Pharmacist. This could be due to the way in which the Vendor Pharmacist was defined in the questionnaire.

The definition focused on the distribution of medications to the nursing home residents. This also may be the reason the dispensing and delivery factors were ranked more important than the regulatory factor. Another interesting point is that the Vendor Pharmacist's practice setting is the least important factor when the distribution system is the most important factor, since the type of distribution system offered to the facility probably will be influenced by the practice setting of the Vendor Pharmacist.

For the Consultant Pharmacist, the experience factor was chosen as the most important factor overall in selecting pharmaceutical services. The experience factor of the Vendor Pharmacist also was considered important to the respondents, if one examines the number of respondents ranking it as the most important factor. From these two pieces of data, along with the knowledge that prior experience with the pharmacist was chosen as most important from among these elements for both Vendor and Consultant Pharmacists, it can be suggested that respondents want a pharmacist who has demonstrated competence in a particular area.

The clinical factor was ranked second most important overall for the Consultant Pharmacist, which could mean the clinical aspects of the pharmacy profession are beginning to emerge more in the long term care facility setting. However, the ranking of the clinical factor as second most important also could have been influenced by the definition used for the Consultant Pharmacist. Probably the most

interesting item from the ranking of the general Consultant Pharmacist factors is that there is essentially a three-way tie for the least important factor. This could be interpreted to mean the auxiliary duties and the practice setting and location of the Consultant Pharmacist are unimportant once all of the other criteria are satisfied.

Committee Member Classification

After analyzing the differences in importance of the evaluative criteria found among the categories of committee members, the tendency seems to be that the Administrators ranked as more important than the other categories of committee members, those general factors or elements of those factors related to the economic viability of the facility. For example, this tendency appears with the ranking of both the Vendor and Consultant Pharmacist regulatory factors. If the Federal and State regulations are not met, the facility will lose its certification for Medicare and Medicaid patients.

For the Vendor and Consultant Pharmacist general factors, Administrators ranked some of the individual elements as more important than the other categories of committee members which suggests the economic concern of the Administrator. These areas were: establishing a restricted formulary, delivery by a pharmacy owned vehicle, checking on appropriate storage of drugs by both the Vendor and the Consultant, the unit-dose dispensing system, assistance in record-keeping activities (especially controlled substances records),

participation of the pharmacist on the Infection Control Committee, having the Consultant Pharmacist consult with the attending physician, and having a Consultant Pharmacist recommended by other health care professionals.

In the majority of these areas, pharmacists can have an impact in controlling or reducing the costs of care to patients. Pharmacists can control costs by implementing a restricted formulary, making sure drugs are properly stored to reduce wastage due to deterioration, and implementing a unit-dose system to reduce wastage due to the discontinuance of medication orders. For the area of having a Consultant Pharmacist recommended by other health care professionals, Administrators may believe this is one method of helping to ensure the quality of pharmaceutical services (i.e. Who better to judge a pharmacist than other health care professionals?).

The Consultant Pharmacists ranked the factors related to their expanding professional duties more important than did the other categories of committee members. These factors were: Vendor distribution system, and Consultant Pharmacist clinical and administrative factors. The distribution system always has been considered the turf of the pharmacist, so it is not surprising that this factor was ranked more important by the Consultant Pharmacist. The Consultant Pharmacist clinical factor contained elements related to the expanding clinical role of the pharmacist, and the administrative factor contained the element of initiating policies and procedures for the

facility.

Some of the individual elements from the Vendor and Consultant Pharmacist general factors which were ranked as most important by the Consultant Pharmacists also show a tendency of supporting the expanding roles of the pharmacy profession. These areas were; participation on the Utilization Review Committee by the Vendor, answering medication storage questions by both the Vendor and the Consultant, doing monthly medication reviews, answering patient therapy questions by the Consultant, and attending patient rounds with the physician.

However, the Consultant Pharmacists do not support the expanding roles of the pharmacy profession in other areas. This tendency is noted in the ranking of some of the other individual elements from the Vendor and Consultant Pharmacist general factors. For example, the Consultant Pharmacists ranked as least important the elements of: taking medication histories, consulting with the attending physician, participating on the Infection Control Committee, checking on the appropriate storage of drugs by both Vendor and Consultant, providing on-call services, having a post-graduate degree for both the Vendor and the Consultant and establishing a restricted formulary by the Vendor Pharmacist. Also, the Consultant Pharmacists preferred the modified traditional system over the unit-dose system.

There were two interesting observations regarding the Consultant Pharmacist. One, the Consultant Pharmacists ranked the Vendor

Pharmacist experience element of prior experience more important than did the other categories of committee members. Second, they also ranked the Consultant Pharmacist experience element of recommended by other health care professionals more important than did the other categories of committee members. This could possibly be the result of those pharmacists already holding positions trying to ensure that pharmacists entering the nursing home environment have the proper training.

The Directors of Nursing ranked the Vendor Pharmacist regulatory factor more important than did the Consultant Pharmacists and the Medical Directors, and the Consultant Pharmacist regulatory factor more important than did the Medical Directors. Also, the Directors of Nursing ranked the Consultant Pharmacist administrative factor the least important among the categories of committee members. Taken collectively, this could mean the Directors of Nursing believed the pharmacist's responsibilities are to provide pharmaceutical services as determined by the regulations, and pharmacists should not expand into administrative functions.

However, an analysis of the ranking of some of the individual elements from the Vendor and Consultant Pharmacist general factors by the Directors of Nursing contradicts the conclusion from the ranking of the general factors. Specifically, the Directors of Nursing ranked more important the Consultant Pharmacist record-keeping activities, and the Vendor Pharmacist on-call services; and less

important the Consultant Pharmacist's participation on the Pharmaceutical Services Committee. Also, the Directors of Nursing ranked less important; the Vendor Pharmacist's participation on the Utilization Review Committee, Consultant Pharmacist's checking appropriate storage of drugs, Consultant Pharmacist's record-keeping activities in relation to controlled substances, and Vendor Pharmacist's answering of medication storage questions.

One final comment about the Directors of Nursing in relation to the Vendor Pharmacist experience factor. When compared to the other committee members, the Directors of Nursing believe that having a Vendor Pharmacist active in professional organizations or with a post-graduate degree is more important than prior experience with a Vendor Pharmacist. The Directors of Nursing appear to use more objective factors when selecting a Vendor Pharmacist for the facility.

The Medical Directors ranked the type of distribution system used in the facility and the Vendor and Consultant Pharmacist regulatory factors less important than did the other categories of committee members. This could mean the Medical Directors are more concerned with the factors they believe have a more direct impact on the care of the patients in the facility. If the Medical Directors did not rank these factors as important as the other categories of committee members did, then they could have ranked more important such factors as the Vendor Pharmacist dispensing factor and the Consultant Pharmacist clinical factor, that deal more with patient care

from a physician's perspective.

An analysis of the rankings of some of the individual elements of the Vendor and Consultant Pharmacist general factors lends further support to the argument that the Medical Directors' perspective is on the care of the patients in the facility. The Medical Directors ranked more important than did the other categories of committee members the individual elements of: the Vendor Pharmacist's participation on the Utilization Review Committee, on-call services, and having a post-graduate degree, and the Consultant Pharmacist's checking on the appropriate storage of drugs, taking medication histories and having a post-graduate degree. Also, the Medical Directors ranked the Vendor Pharmacist's establishment of a restricted formulary less important than did the other categories of committee members. All of these factors, it could be argued, would have a positive impact on patient care in a facility.

The rankings given to three of the individual elements from the Vendor and Consultant Pharmacist general factors, however, would contradict the patient care perspective. These three rankings show the Medical Directors ranked less important than did the other categories of committee members the Vendor Pharmacist's checking appropriate storage of drugs and the Consultant Pharmacist's performing monthly medication reviews and answering patient therapy questions. These rankings may be explained if the Medical Directors held the belief that this was not the Consultant Pharmacist's area of

practice, and the Consultant Pharmacist was better qualified to check appropriate storage of drugs than was the Vendor Pharmacist. One other contradictory ranking was the more important ranking given to the Consultant Pharmacist's participation on the Pharmaceutical Services Committee when compared to the low importance ranking given to the regulatory factors in general. It is possible this is the only requirement the Medical Directors remembered or believed was important.

To conclude this section on the differences in the importance of the evaluative criteria among the categories of committee members, two comments should be made. First, because of the differing response rates for the categories of committee members, it is difficult to tell exactly what would be the end result of a committee meeting. Second, and related to the first, the politics of a committee meeting would definitely have an impact on the end result of any committee meeting. What this means is that in a particular pharmaceutical services committee meeting, the Administrator or the Director of Nursing may be more influential in the final decision for selecting pharmaceutical services than the Consultant Pharmacist or the Medical Director. Or, there may be a compromise between two allies so as to achieve together what only one wanted in the beginning.

Ownership Type

All of the differences found among the pharmaceutical services

committee members from facilities of different ownership types in this study were in the area of the Vendor Pharmacist evaluative criteria. If the assumption is true, as reported previously, that for-profit facilities have a different economic orientation than other types of facilities, then this is a rather peculiar finding. It is usually the Consultant Pharmacist that has the most dramatic impact on the economic factors associated with pharmaceutical services, because they are dealing with the clinical aspects of this service.

The differences in importance of the evaluative criteria that were found for the committee members from the for-profit facilities could possibly lend themselves to a difference in the economic orientation of these types of facilities. However, the emphasis on economic variables seen in other studies was not found in this study. The areas of difference for the committee members from the for-profit facilities were: the Vendor Pharmacist's provision of on-call services, weekly home visits to the facility, checking for appropriate storage of drugs and establishment of a stop-order policy by the Vendor Pharmacist. Additionally, the traditional delivery system was preferred to a greater extent by the committee members in the for-profit facilities than by the committee members in other types of facilities.

Committee members in for-profit facilities prefer to have the Vendor Pharmacist check for appropriate storage of drugs to eliminate wastage due to deterioration. Also, the Vendor Pharmacist should have on-call services and visit the facility frequently to help assure

the services are kept running smoothly. The preference for a traditional system of distribution, along with the low importance placed on an automatic stop-order policy may mean that more of the medications dispensed can be used for patients rather than being discarded because the order was stopped. Another possible explanation for the preference for a traditional system of distribution is that there is a short-term economic benefit to facilities with this type of distribution system because initial costs of capitalization are less.

Another difference among the pharmaceutical services committee members from the different ownership types was the general factor of the practice setting of the Vendor Pharmacist. This was the only general factor to be ranked significantly different among the pharmaceutical services committee members from facilities of different ownership types. The committee members of governmental facilities ranked this factor more important than did the committee members in for-profit facilities. Presumably this means governmental facilities prefer the in-house practice setting more than others do.

One final difference found among the pharmaceutical services committee members from facilities of different ownership types was that nonprofit facility committee members ranked the ability of the Vendor to prepare sterile IV solutions more important than did committee members from governmental facilities. An explanation for this would be that the patients in nonprofit facilities are more in need of this type of service than are those in governmental facilities.

In examining the differences found by ownership type, it is apparent that the nonprofit and governmental facilities should not be grouped together for analysis of all variables. There were instances when the committee members from governmental facilities were aligned more closely with committee members from for-profit facilities than with those from nonprofit homes.

Bed Size Category

The results for differences in the importance of the evaluative criteria among the pharmaceutical services committee members from facilities of different bed size categories do not show any clear groupings. Hopefully, the differences in the importance of the evaluative criteria found among the committee members from facilities of different bed size categories would lead to a clear distinction similar to the research done to determine at what point economies of scale are present. However, the grouping of facilities for an optimum facility size seems to depend to a great extent upon what variable is to be analyzed.

When the responses of pharmaceutical services committee members from facilities with less than 100 beds are separated and analyzed, it is noted that these committee members ranked the Consultant Pharmacist location, delivery with a pharmacy owned vehicle, Consultant Pharmacists' quarterly written reports and having a Consultant Pharmacist with a post-graduate degree more important

than did committee members from the other two categories; the Consultant clinical factor less important than did committee members from the greater than 200 beds category; and the Consultant practice setting more important than did committee members from the 100 to 200 beds category. From this it appears that committee members from the smaller size facilities are more concerned with just receiving the medications for their patients. The clinical services of a Consultant Pharmacist are not considered important.

Separating the responses of the pharmaceutical services committee members from facilities with greater than 200 beds reveals that these committee members ranked the Vendor Pharmacist's establishment of an automatic stop-order policy and provision of a unit-dose distribution system more important; and the Vendor Pharmacist's participation on the Infection Control Committee and the Pharmaceutical Services Committee, and having either the Vendor or the Consultant Pharmacist within one-half hour less important than did their counterparts in the other two categories of facilities. This could mean these respondents are past the point of worrying about receiving the medications for their residents and are concentrating on special services in their pharmaceutical package. Also, it is possible that these larger facilities will have in-house pharmacies, thereby making the question of location, practice setting and distribution system used a low priority.

The ranking of the Vendor Pharmacist dispensing factor is the

only example of the responses of the pharmaceutical services committee members from facilities in the 100 to 200 beds category being separated from those of the committee members in the other two categories. In this case, the committee members from facilities with 100 to 200 beds ranked this factor more important than did the committee members from the other two categories. After examining the elements in the dispensing factor, having the Vendor Pharmacist check on the appropriate storage of drugs appears to be the reason for committee members from facilities with 100 to 200 beds ranking this factor more important.

To conclude this section, although more differences were found for facilities of differing bed sizes than have been reported in the literature, no clear distinction can be made as to which bed size is optimal. The effect of any economies of scale associated with the pharmaceutical services for a facility of a particular bed size could not be concluded from the data gathered. However, it must be remembered that this study did not concentrate on economic variables as has been the focus of the previous studies. It also was found that more than one level of the bed size variable may need to be incorporated into future studies in order to reflect accurately the environment in which nursing homes operate.

CHAPTER 7
CONCLUSIONS AND RECOMMENDATIONS

This study was undertaken to add to the body of information available on how pharmaceutical services are selected by pharmaceutical services committee members in a long term care facility. Most of the information now available in the literature on how pharmaceutical services are selected for long term care facilities deals with only one aspect of the entire spectrum of services. The main emphasis of this study was to attempt to integrate the various components of the delivery of pharmaceutical services, and determine which variables may influence the importance of the evaluative criteria for selecting these services, such as the category of pharmaceutical services committee membership, ownership type and bed size of a SNF. The conclusions drawn from the results will be summarized according to the variables examined. Then areas for future research in this field will be recommended.

For the variable of committee member classification, the differences found were similar to what could have been theorized a priori. The Administrator was concerned primarily with those variables dealing with the economic viability of the facility. Consultant Pharmacists perceived the nursing home environment as an opportunity to expand the roles of the profession. However, Directors of Nursing believed that pharmacists should be limited to those duties and

responsibilities prescribed to them by the regulations. The Medical Directors believed the variables dealing with patient care were more important in selecting pharmaceutical services. It also is apparent that committee members may arrive at the same conclusion as to which factors are important for selecting pharmaceutical services using the different perspectives they have obtained from their varying backgrounds.

The variable of ownership type of a facility showed differences mainly for the for-profit facilities. The factors and elements where the differences occurred primarily had an economic orientation. However, the main conclusion from the results of this section is that the nonprofit and governmental facilities will not always be aligned with each other in their choice of evaluative criteria. This is an important point because of its policy-making implications.

Finally, differences found based upon the bed size of a facility showed no clear consensus as to a preferred facility size. It did appear, however, that personnel from smaller size facilities are more concerned with just obtaining the minimum level of pharmaceutical services. Pharmaceutical services committee members for facilities with greater than 200 beds are not overly concerned about how they will obtain pharmaceutical services, but instead focus their attention on obtaining special or advanced services.

One area for future research, to expand on what was found in this study, would be to refine this instrument to obtain a different

type of datum. What this means is that the types of analyses done in this study were somewhat limited by the nature of the data gathered. If a different form of information was collected, such as that from a semantic differential or Likert-type scale, but still measuring the same domain, more powerful statistical tests could be performed. These tests may be able to determine if any interactions exist among the variables examined in this study. Also, it is possible that not all of the variables upon which the decision for selecting pharmaceutical services rests were examined in this study.

Future researchers also could attempt to determine the relationships among the level of pharmaceutical services present in a facility and the decision criteria chosen as important in this study. This may help to validate an instrument to be used in future research. Another area related to this would be to gather the same information from States' long term care facility surveyors and correlate it with the results from this study. This would give a measure of the influence of the regulatory agencies upon the services delivered in the long term care environment.

Probably the most rewarding topic in this area of research would be to assess what effect the differences found in this study have on the quality of care for the patients. In other words, if there is a major disagreement among members of the pharmaceutical services committee in a particular facility, is it resolved so that high quality care still is provided? In order to assess this effect, a more intensive

study would have to be performed, with the inclusion of some type of quality measure included in the data collection process.

In addition to providing information about the differences found among categories of committee members, or committee members from facilities with different organizational characteristics, this study can serve as introductory information for other areas of study, such as, studies to evaluate how the differences found among the categories of committee members impacts on the group decision concerning pharmaceutical services. How do group decisions affect the quality of care concerning pharmaceutical services in a long term care facility? Or studies to evaluate if facilities with a certain set of organizational characteristics provide better pharmaceutical services to their residents. The studies which try to assess the impact of the group decision for selecting pharmaceutical services on quality of care may find that the group needs to be either larger or smaller to be more effective; or possibly, the levels of reimbursement need to be changed to allow more facilities of a certain ownership characteristic or size (eg. for-profit facilities or facilities smaller than 100 beds) to prosper in the nursing home environment. The quality of care studies may then lead to new regulations for long term care facilities which would implement the desired changes.

Finally, the study provides baseline information for researching criteria used by a group in selecting Vendor and Consultant pharmacy services and comparing it to individual consumer criteria used in

selecting a pharmacy for prescription drugs. This is similar to the group decisions made by managed health care groups, such as Health Maintenance Organizations and Preferred Provider Organizations, about which pharmacies patients can utilize to obtain their prescription drugs. It is possible the decisions made in the managed health care groups are based upon the same type of criteria. If this is true, then the same type of differences could be explored for the decisions made by these groups.

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APPENDIX A

The Pretest Instrument

University of Wisconsin Madison

CENTER FOR HEALTH SCIENCES
School of Pharmacy
425 North Charter Street
Madison, Wisconsin 53706
Telephone: 608/262-1416

March 1987

Dear Pharmaceutical Services Committee Member:

As a member of the Pharmaceutical Services Committee, you have an opportunity to recommend improvements in the pharmaceutical services that patients receive in your particular nursing home. We are attempting to learn what criteria you would use in making your recommendation for choosing a nursing home vendor and consultant pharmacist's services.

You were selected from a sample of nursing home Pharmaceutical Service Committee members throughout Wisconsin. Please take about 12 minutes to complete this booklet. Your responses are anonymous.

The information you provide will help us identify and begin to understand the decision criteria used in the selection of vendor and consultant pharmacists.

Thank you for your help.

Sincerely,

Pharmacist Timothy L. Lobner
Masters Candidate in
Pharmacy Administration

PS. Please enjoy a beverage of your choice while completing the booklet.

A. Please answer the following questions as if you are negotiating for the services of a vendor pharmacist for your nursing home. A vendor pharmacist is the pharmacist whose responsibilities and experiences include dispensing medications to nursing home residents. This section contains eight general Factors associated with a vendor pharmacist.

For each general Factor 1 through 5, please rank the specific elements in order of importance. Use the ranking 1 = Most Important through 5 = Least Important. Remember, please make sure you rank each element. Thank you.

1. Vendor Pharmacist Administrative Factor. Please rank from 1=most important to 5=least important.

_____ Participates in utilization review committee meetings.

_____ Conducts observations of medication administration before State inspections to identify problem areas.

_____ Selects appropriate pharmaceutical reference materials for use in the nursing home.

_____ Assists in record-keeping activities by making available billing information, patient profiles, medication records, treatment Kardexes, and inventory control information.

_____ Establishes a restricted formulary for the nursing home.

2. Vendor Pharmacist Experience Factor. Again, please rank in order of importance using the above scale.

_____ Recommended by other health care professionals in another institution.

_____ Have had prior experience with the vendor pharmacist.

_____ Active in professional organizations and participates in continuing education programs.

_____ Recommended by other pharmaceutical service committee members.

_____ Has a post-graduate degree.

3. Vendor Pharmacist Regulatory Factor. Please rank from 1=most important to 5=least important.

_____ Visits home on a weekly basis.

_____ Participates in the Pharmaceutical Services committee meetings.

_____ Replaces emergency box, refrigerator box and narcotic box within 72 hours after they have been opened.

_____ Establishes an automatic stop-order policy for the nursing home.

_____ Participates in the Infection Control committee meetings.

4. Vendor Pharmacist Delivery Factor. Please rank from 1=most important to 5=least important.

_____ Drug deliveries are made by a public third-party vehicle.

_____ Deliveries are made at least once a day.

_____ Drug deliveries are made with a private pharmacy-owned vehicle.

_____ On-call services available 24 hours a day and 365 days a year.

_____ Offers emergency ordering and delivery services during pharmacy hours.

5. Vendor Pharmacist Dispensing Factor. Please rank these elements in order of importance using the above scale.

_____ Answers medication storage questions.

_____ Lowest-priced of the competing pharmacists with respect to dispensing functions.

_____ Supervises maintenance of appropriate controlled substances records for the nursing home.

_____ Checks on appropriate storage of drugs and biologicals in the nursing home on every visit.

_____ Has the capability at the pharmacy to prepare sterile IV solutions with drug additives.

For the next three Factors, please choose ONLY ONE of the elements for each Factor. Please check your preference in the space provided.

6. Which type of distribution system (please choose only one) would you prefer your vendor pharmacist to provide to your nursing home.

_____ Provides a traditional (prescription vial) drug delivery system.

_____ Provides a modified traditional (tablets and capsules in unit-dose, liquids and ointments in bulk supply) drug delivery system.

_____ Provides a unit-dose (unit-of-use) drug delivery system.

7. Please select the one pharmacy practice setting from which you prefer your vendor pharmacist to practice.

_____ Practices in a hospital pharmacy.

_____ Practices in a LTCF speciality pharmacy.

_____ Practices from an in-house pharmacy.

_____ Practices in an independent community pharmacy (less than 4 units under the same ownership).

_____ Practices in a chain pharmacy (4 or more units under the same ownership).

8. Now we would like you to think about the physical location of the vendor pharmacist in relation to the nursing home. What is the maximum allowable distance, in minutes, the vendor pharmacist should be physically located from the nursing home for an emergency order? Please choose ONLY ONE.

_____ less than one-half hour

_____ one-half to two hours

_____ greater than two hours but less than six hours

_____ greater than six hours but less than 12 hours

_____ greater than 12 hours but less than 24 hours

B. Now please rank the eight general vendor pharmacist Factors in order of importance. Use the scale 1= most important through 8 = least important. Remember, the general Factors represented specific elements important to you in the selection of a vendor pharmacist for your nursing home. Make sure each Factor is assigned a number. Thank you.

_____ Location

_____ Distribution System

_____ Administrative Factor

_____ Dispensing Factor

_____ Pharmacy Practice Setting

_____ Regulatory Factor

_____ Experience Factor

_____ Delivery Factor

C. Now, we want to ask your opinion about negotiating for the services of a consultant pharmacist. By regulation, the consultant pharmacist is responsible for monitoring and ensuring quality pharmaceutical services to nursing home residents. Below are listed seven general Factors associated with a consultant pharmacist.

Again, for Factors 1 through 5, please rank the specific elements in order of importance. Use the ranking 1 = Most Important through 5 = Least Important. Please make sure each element has been ranked. Thank you.

1. Consultant Pharmacist Auxiliary Factor. Please rank in order of importance using the above scale.

_____ Assists in record-keeping activities by making available billing information, patient profiles, medication records, treatment Kardexes and inventory control information.

_____ Conducts observations of medication administration before State inspections to identify problem areas.

_____ Lowest-priced of the competing pharmacists with respect to consulting services.

_____ Answers medication storage questions.

_____ Selects appropriate pharmaceutical reference materials for use in the nursing home.

2. Consultant Pharmacist Regulatory Factor. Please rank from 1=most important to 5=least important.

_____ Supervises maintenance of appropriate controlled substances records for the nursing home.

_____ Checks on appropriate storage of drugs and biologicals on every visit.

_____ Performs patient medication reviews monthly.

_____ Offers inservice education programs for nurses and other health care personnel in the facility.

_____ Visits home on a weekly basis.

3. Consultant Pharmacist Administrative Factor. Again please rank in order of importance using the above scale.

_____ Initiates written pharmaceutical policies and procedures for the nursing home.

_____ Submits quarterly pharmaceutical activities written reports to the nursing home administrator.

_____ Participates in Pharmaceutical Services committee meetings.

_____ Participates in Utilization Review committee meetings.

_____ Participates in Infection Control committee meetings.

4. Consultant Pharmacist Clinical Factor. Please rank from 1=most important to 5=least important.

_____ Answers patient therapy questions.

_____ Consults directly with the attending physician and makes recommendations on appropriate therapy.

_____ Accompanies the physician on patient rounds.

_____ Obtains medication histories from residents upon admission and conducts discharge consultations with patients when they are discharged.

_____ Performs professional functions such as dose scheduling and drug interaction monitoring and notification.

5. Consultant Pharmacist Experience Factor. Please rank in order of importance using the above scale.

_____ Recommended by other pharmaceutical service committee members.

_____ Recommended by other health care professionals in another institution.

_____ Have had prior experience with the consultant pharmacist.

_____ Is active in professonal organizations and participates in continuing education.

_____ Has a post-graduate degree.

For the next two Factors we would like you to choose only one of the possible elements. Please check your preference in the space provided.

6. Please select the one pharmacy practice setting from which you prefer your consultant pharmacist to practice.

_____ Practices in a hospital pharmacy.

_____ Practices in a consultant-only pharmacy

_____ Practices in an independent community pharmacy (less than 4 units under the same ownership).

_____ Practices in a chain pharmacy (4 or more units under the same ownership).

_____ Practices in a LTCF specialty pharmacy.

_____ Practices from an in-house pharmacy.

7. Now we would like you to think about the physical location of the consultant pharmacist in relation to the nursing home. What is the maximum allowable distance, in minutes, the consultant pharmacist should be physically located from the nursing home for an emergency order. Please check ONLY ONE.

_____ less than one-half hour

_____ one-half to two hours

_____ greater than two but less than six hours

_____ greater than six but less than 12 hours

_____ greater than 12 but less than 24 hours

D. Now, please rank the seven general consultant pharmacist Factors in order of importance. Use the scale 1=most important through 7=least important. Remember, the general factors represent specific elements important to you in the selection of a consultant pharmacist for your nursing home. Again, make sure each Factor is assigned a number.

_____ Experience Factor

_____ Auxiliary Factor

_____ Regulatory Factor

_____ Administrative Factor

_____ Clinical Factor

_____ Pharmacy Practice Setting

_____ Location

E. In this section, we will ask some questions about your attitude toward the vendor and consultant pharmacist's provision of services in a Skilled Nursing Facility. Please check the space that most closely indicates your attitude toward each statement.

The vendor and consultant pharmacists should:

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
a) have separate contracts	___	___	___	___	___
b) be different persons	___	___	___	___	___
c) come from pharmacies at different locations.	___	___	___	___	___
d) have no economically related interests.					

F. Finally, your answers to some questions about yourself will help us analyze the results of the study. Please check or write in your response.

1. What is your responsibility at this nursing home?

____ Administrator ____ Medical Director
____ Consultant Pharmacist ____ Director of Nursing **
(Please answer questions at bottom of page)

2. How many total years of experience do you have in this position? ____

3. How many total years have you been associated with nursing homes? ____

4. What is your age? ____

5. What is your gender? ____ Male ____ Female

THANK YOU FOR YOUR RESPONSE!

Please fold booklet and place in
self-addressed, stamped envelope. Thank you.

**The next two questions are for the Director of Nursing only!
All others have completed the form.

Please estimate the number of years you have worked with the current drug distribution system in your nursing home. _____ years

Are the vendor and consultant pharmacist the same person at your nursing home?

____ Yes ____ No ____ Don't Know

APPENDIX B

The Final Instrument

University of Wisconsin Madison

CENTER FOR HEALTH SCIENCES
School of Pharmacy
425 North Charter Street
Madison, Wisconsin 53706
Telephone: 608/262-1416

July 1987

Dear Pharmaceutical Services Committee Member:

As a member of the Pharmaceutical Services Committee, you have an opportunity to recommend improvements in the pharmaceutical services that patients receive in your particular nursing home. We are attempting to learn what criteria you would use in making your recommendation for choosing a nursing home vendor and consultant pharmacist's services.

You were selected from a sample of nursing home Pharmaceutical Service Committee members throughout Wisconsin. Please take about 14 minutes to complete this booklet. Your responses are anonymous.

The information you provide will help us identify and begin to understand the decision criteria used in the selection of vendor and consultant pharmacists. If you have any comments about the form, please write them in the space provided on the last page.

Thank you for your help.

Sincerely,

Pharmacist Joseph B. Wiederholt, Ph.D.

Pharmacist Timothy L. Lobner

PS. Please enjoy a beverage of your choice while completing the booklet.

A. Please answer the following questions as if you are negotiating for the services of a vendor pharmacist for your nursing home. A vendor pharmacist is the pharmacist whose responsibilities and experiences include dispensing medications to nursing home residents. This section contains eight general Factors associated with a vendor pharmacist.

Factors 1 through 5 contain 5 elements each. Please rank the 5 specific elements within each Factor in order of importance. Use the ranking 1=Most Important, 2=Second Most Important, 3=Third Most Important, 4=Fourth Most Important, and 5=Fifth Most Important. Please make sure each number is used once within each Factor. Thank you.

1. Vendor Pharmacist Administrative Factor. Please rank each element in order of importance by using the above scale.

_____ Participates in Utilization Review committee meetings.

_____ Conducts observations of medication administration before State inspections to identify problem areas.

_____ Selects appropriate pharmaceutical reference materials for use in the nursing home.

_____ Assists in record-keeping activities by making available billing information, patient profiles, medication records, treatment Kardexes, and inventory control information.

_____ Establishes a restricted formulary for the nursing home.

2. Vendor Pharmacist Experience Factor. Again please rank in order of importance using the above scale.

_____ Recommended by other health care professionals in another institution.

_____ Have had prior experience with the vendor pharmacist.

_____ Active in professional organizations and participates in continuing education programs.

_____ Recommended by other pharmaceutical service committee members.

_____ Has a post-graduate degree.

3. Vendor Pharmacist Regulatory Factor. Again please rank in order of importance using the above scale.

_____ Visits home on a weekly basis.

_____ Participates in the Pharmaceutical Services committee meetings.

_____ Replaces emergency box, refrigerator box and narcotic box within 72 hours after they have been opened.

_____ Establishes an automatic stop-order policy for the nursing home.

_____ Participates in the Infection Control committee meetings.

4. Vendor Pharmacist Delivery Factor. Please rank in order of importance by using the scale on the previous page.

_____ Drug deliveries are made by a public third-party vehicle.

_____ Deliveries are made at least once a day.

_____ Drug deliveries are made with a private pharmacy-owned vehicle.

_____ On-call services available 24 hours a day and 365 days a year.

_____ Offers emergency ordering and delivery services during pharmacy hours.

5. Vendor Pharmacist Dispensing Factor. Again please rank these elements in order of importance using the scale on the previous page.

_____ Answers medication storage questions.

_____ Lowest-priced of the competing pharmacists with respect to dispensing functions.

_____ Supervises maintenance of appropriate controlled substances records for the nursing home.

_____ Checks on appropriate storage of drugs and biologicals in the nursing home on every visit.

_____ Has the capability at the pharmacy to prepare sterile IV solutions with drug additives.

For the next three Factors, please choose ONLY ONE of the elements for each Factor. Please check your preference in the space provided.

6. Which type of distribution system (please choose only one) would you prefer your vendor pharmacist to provide to your nursing home.

_____ Provides a traditional (prescription vial) drug delivery system.

_____ Provides a modified traditional (tablets and capsules in unit-dose, liquids and ointments in bulk supply) drug delivery system.

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7. Please select the one pharmacy practice setting from which you prefer your vendor pharmacist to practice.

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_____ Practices from an in-house pharmacy.

_____ Practices in an independent community pharmacy (less than 4 units under the same ownership).

_____ Practices in a chain pharmacy (4 or more units under the same ownership).

8. Now we would like you to think about the physical location of the vendor pharmacist in relation to the nursing home. What is the maximum allowable distance, in hours, the vendor pharmacist should be physically located from the nursing home for an emergency order? Please choose ONLY ONE.

_____ less than one-half hour

_____ one-half to two hours

_____ greater than two hours up to six hours

_____ greater than six hours up to 12 hours

_____ greater than 12 hours up to 24 hours

B. Now please rank the eight general vendor pharmacist Factors in order of importance. Use the scale 1=most important through 8=eighth most important. Remember, the general Factors represent specific elements important to you in the selection of a vendor pharmacist for your nursing home. Make sure each Factor is assigned a number. Thank you.

_____ Location

_____ Distribution System

_____ Administrative Factor

_____ Dispensing Factor

_____ Pharmacy Practice Setting

_____ Regulatory Factor

_____ Experience Factor

_____ Delivery Factor

C. Now, we want to ask your opinion about negotiating for the services of a consultant pharmacist. By regulation, the consultant pharmacist is responsible for monitoring and ensuring quality pharmaceutical services to nursing home residents. Below are listed seven general Factors associated with a consultant pharmacist.

Again, Factors 1 through 5 contain 5 elements each. Please rank the 5 specific elements within each Factor in order of importance. Use the ranking 1=Most Important, 2=Second Most Important, 3=Third Most Important, 4=Fourth Most Important, and 5=Fifth Most Important. Please make sure each number is used once within each Factor. Thank you.

1. Consultant Pharmacist Auxiliary Factor. Please rank in order of importance using the above scale.

_____ Assists in record-keeping activities by making available billing information, patient profiles, medication records, treatment Kardexes and inventory control information.

_____ Conducts observations of medication administration before State inspections to identify problem areas.

_____ Lowest-priced of the competing pharmacists with respect to consulting services.

_____ Answers medication storage questions.

_____ Selects appropriate pharmaceutical reference materials for use in the nursing home.

2. Consultant Pharmacist Regulatory Factor. Again please rank in order of importance using the above scale.

_____ Supervises maintenance of appropriate controlled substances records for the nursing home.

_____ Checks on appropriate storage of drugs and biologicals on every visit.

_____ Performs patient medication reviews monthly.

_____ Offers inservice education programs for nurses and other health care personnel in the facility.

_____ Visits home on a weekly basis.

3. Consultant Pharmacist Administrative Factor. Again please rank in order of importance using the above scale.

_____ Initiates written pharmaceutical policies and procedures for the nursing home.

_____ Submits quarterly pharmaceutical activities written reports to the nursing home administrator.

_____ Participates in Pharmaceutical Services committee meetings.

_____ Participates in Utilization Review committee meetings.

_____ Participates in Infection Control committee meetings.

4. Consultant Pharmacist Clinical Factor. Please rank in order of importance using the scale on the previous page.

_____ Answers patient therapy questions.

_____ Consults directly with the attending physician and makes recommendations on appropriate therapy.

_____ Accompanies the physician on patient rounds.

_____ Obtains medication histories from residents upon admission and conducts discharge consultations with patients when they are discharged.

_____ Performs professional functions such as dose scheduling and drug interaction monitoring and notification.

5. Consultant Pharmacist Experience Factor. Please rank in order of importance using the scale on the previous page.

_____ Recommended by other pharmaceutical service committee members.

_____ Recommended by other health care professionals in another institution.

_____ Have had prior experience with the consultant pharmacist.

_____ Is active in professonal organizations and participates in continuing education.

_____ Has a post-graduate degree.

For the next two Factors we would like you to choose only one of the possible elements. Please check your preference in the space provided.

6. Please select the one pharmacy practice setting from which you prefer your consultant pharmacist to practice.

_____ Practices in a hospital pharmacy.

_____ Practices in a consultant-only pharmacy

_____ Practices in an independent community pharmacy (less than 4 units under the same ownership).

_____ Practices in a chain pharmacy (4 or more units under the same ownership).

_____ Practices in a LTCF specialty pharmacy.

_____ Practices from an in-house pharmacy.

7. Now we would like you to think about the physical location of the consultant pharmacist in relation to the nursing home. What is the maximum allowable distance, in hours, the consultant pharmacist should be physically located from the nursing home for an emergency order. Please check ONLY ONE.

_____ less than one-half hour

_____ one-half to two hours

_____ greater than two hours up to six hours

_____ greater than six hours up to 12 hours

_____ greater than 12 hours up to 24 hours

D. Now, please rank the seven general consultant pharmacist Factors in order of importance. Use the scale 1=most important through 7=seventh most important. Remember, the general factors represent specific elements important to you in the selection of a consultant pharmacist for your nursing home. Again, make sure each Factor is assigned a number.

_____ Experience Factor

_____ Auxiliary Factor

_____ Regulatory Factor

_____ Administrative Factor

_____ Clinical Factor

_____ Pharmacy Practice Setting

_____ Location

E. In this section, we ask some questions about your opinion toward the vendor and consultant pharmacist's provision of services in a Skilled Nursing Facility. Please check the space that most closely represents your opinion toward each statement.

The vendor and consultant pharmacists should:

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
a) have separate contracts	___	___	___	___	___
b) be different persons	___	___	___	___	___
c) come from pharmacies at different locations.	___	___	___	___	___
d) have no economically related interests.	___	___	___	___	___

F. Finally, your answers to some questions about yourself will help us analyze the results of the study. Please check or write in your response.

1. What is your responsibility at this nursing home?

___ Administrator ___ Medical Director (Physician)
___ Consultant Pharmacist ___ Director of Nursing

2. How many total years of experience do you have in this position? ___

3. How many total years have you been associated with nursing homes? ___

4. What is your age? ___

5. What is your gender? ___ Male ___ Female

COMMENTS ABOUT THIS FORM

THANK YOU FOR YOUR RESPONSE!

Please fold booklet and place in
self-addressed, stamped envelope. Thank you.

APPENDIX C

Letters to People Influential in the Nursing Home Industry

University of Wisconsin Madison

CENTER FOR HEALTH SCIENCES
School of Pharmacy
425 North Charter Street
Madison, Wisconsin 53706
Telephone: 608/262-1416

July 7, 1987

Patty Beck
ATTN: Nursing Home Branch
Wisconsin Counties Association
802 W. Broadway
Madison, WI 53716

Dear Ms. Beck:

Please find enclosed a copy of a questionnaire we are distributing to a representative sample of Pharmaceutical Service Committee members in nursing homes throughout the State of Wisconsin. We are attempting to learn what criteria are used in making recommendations for nursing home vendor and consultant pharmacist's services.

If you have any questions about this study, please contact us at (608) 262-0452.

Sincerely,

Pharmacist Joseph B. Wiederholt, Ph.D.

Pharmacist Timothy L. Lobner

TLL/jmm

Enc.

University of Wisconsin Madison

CENTER FOR HEALTH SCIENCES
School of Pharmacy
425 North Charter Street
Madison, Wisconsin 53706
Telephone: 608/262-1416

July 7, 1987

Dan Jehl
Wisconsin Homes and Services
for the Aging
7 N. Pinckney Street
Madison, WI 53703

Dear Mr. Jehl:

Please find enclosed a copy of a questionnaire we are distributing to a representative sample of Pharmaceutical Service Committee members in nursing homes throughout the State of Wisconsin. We are attempting to learn what criteria are used in making recommendations for nursing home vendor and consultant pharmacist's services.

If you have any questions about this study, please contact us at (608) 262-0452.

Sincerely,

Pharmacist Joseph B. Wiederholt, Ph.D.

Pharmacist Timothy L. Lobner

TLL/jmm

Enc.

University of Wisconsin Madison

CENTER FOR HEALTH SCIENCES
School of Pharmacy
425 North Charter Street
Madison, Wisconsin 53706
Telephone: 608/262-1416

July 7, 1987

Tom Moore
Wisconsin Association of
Nursing Homes
14 S. Carroll Street
Madison, WI 53703

Dear Mr. Moore:

Please find enclosed a copy of a questionnaire we are distributing to a representative sample of Pharmaceutical Service Committee members in nursing homes throughout the State of Wisconsin. We are attempting to learn what criteria are used in making recommendations for nursing home vendor and consultant pharmacist's services.

If you have any questions about this study, please contact us at (608) 262-0452.

Sincerely,

Pharmacist Joseph B. Wiederholt, Ph.D.

Pharmacist Timothy L. Lobner

TLL/jmm

Enc.

University of Wisconsin Madison

CENTER FOR HEALTH SCIENCES
School of Pharmacy
425 North Charter Street
Madison, Wisconsin 53706
Telephone: 608/262-1416

July 7, 1987

Dan Skalecki
WPhA - Long-term Care Section
3939 S. 92nd Street
Greenfield, WI 53228

Dear Mr. Skalecki:

Please find enclosed a copy of a questionnaire we are distributing to a representative sample of Pharmaceutical Service Committee members in nursing homes throughout the State of Wisconsin. We are attempting to learn what criteria are used in making recommendations for nursing home vendor and consultant pharmacist's services.

If you have any questions about this study, please contact us at (608) 262-0452.

Sincerely,

Pharmacist Joseph B. Wiederholt, Ph.D.

Pharmacist Timothy L. Lobner

TLL/jmm

Enc.

University of Wisconsin Madison

CENTER FOR HEALTH SCIENCES
School of Pharmacy
425 North Charter Street
Madison, Wisconsin 53706
Telephone: 608/262-1416

July 8, 1987

Bob Henry
Wisconsin Pharmaceutical Association
202 Price Place
Madison, WI 53705

Dear Mr. Henry:

Please find enclosed a copy of a questionnaire we are distributing to a representative sample of Pharmaceutical Service Committee members in nursing homes throughout the State of Wisconsin. We are attempting to learn what criteria are used in making recommendations for nursing home vendor and consultant pharmacist's services.

If you have any questions about this study, please contact us at (608) 262-0452.

Sincerely,

Pharmacist Joseph B. Wiederholt, Ph.D.

Pharmacist Timothy L. Lobner

TLL/jmm

Enc.

APPENDIX D

The Follow-Up Postcard

Dear Pharmaceutical Services Committee Member:

Last week you received a form inquiring about the criteria you would use in making your recommendation for choosing a nursing home vendor and consultant pharmacist's services.

If you already have completed and mailed the form, THANK YOU VERY MUCH FOR YOUR HELP! If you have not mailed the completed form, please do so today.

Thank you!

Sincerely,

Pharmacist Timothy L. Lobner

P.S. If you did not receive a form and wish to participate, please call me at (608) 262-6534.

APPENDIX E

The Coding Format

MASTER CODING FOR MASTER'S THESIS PROJECT

All column widths are specified under position and are numeric

Column position		Variable code
C1-3	Form Number	IND
	000-999 Number written on form	
C4	Ownership Category	OWN
1	Nonprofit	
2	Profit	
3	Governmental	
C5	Bed Size Category	BEDS
1	Less Than 100	
2	100-200	
3	Greater Than 200	

Questions in numerical order from the questionnaire

C6-10 Vendor Pharmacist Administrative Factor

Utilization Review Committee Meetings	VADUR
Observes Medication Administration	VADMA
Pharmaceutical Reference Materials	VADPRM
Record-keeping Activities	VADRA
Restricted Formulary	VADRF

1 through 5-Actual Number Ranking by the Respondents
9-Nonresponse

C11-15 Vendor Pharmacist Experience Factor

Other Health Care Professionals	VEXOHC
Prior Experience	VEXPEX
Active in Professional Organizations	VEXPRO
Other Committee Members	VEXOCM
Post-graduate Degree	VEXPGD

For Coding see Vendor Pharmacist Administrative Factor

C16-20 Vendor Pharmacist Regulatory Factor

Weekly Home Visits	VRFWHV
Pharmaceutical Services Committee	VRFPSC
Back-up System Replacement	VRFBUS
Automatic Stop-order Policy	VRFSOP
Infection Control Committee	VRFICC

For Coding see Vendor Pharmacist Administrative Factor

C21-25 Vendor Pharmacist Delivery Factor

Public Third-party Vehicle	VDELTPV
Once-daily Deliveries	VDELDAY
Private Pharmacy-owned Vehicle	VDELPOV
On-call Services Available	VDELOCS
Emergency Ordering Services	VDELEOS

For Coding see Vendor Pharmacist Administrative Factor

C26-30 Vendor Pharmacist Dispensing Factor

Answers Medication Questions	VDISMQ
Lowest-priced Dispensing Functions	VDISDF
Controlled Substances Records	VDISCSR
Appropriate Storage of Drugs	VDISSD
Sterile IV Solutions	VDISIV

For Coding see Vendor Pharmacist Administrative Factor

C31 Vendor Pharmacist Distribution System VDISSYS1

1 Traditional Delivery System
2 Modified Traditional System
3 Unit-dose Delivery System
9 Nonresponse

C32 Vendor Pharmacist Practice Setting VPRAC1

1 Hospital Pharmacy
2 LTCF Specialty Pharmacy
3 In-house Pharmacy
4 Independent Community Pharmacy
5 Chain Pharmacy
9 Nonresponse

C33 Vendor Pharmacist Location VLOC1

1 Less Than One-half Hour
2 One-half to 2 Hours
3 Greater Than 2 Hours to 6 Hours
4 Greater Than 6 Hours to 12 Hours
5 Greater Than 12 Hours to 24 Hours
9 Nonresponse

C34-41 Vendor Pharmacist Factor Rankings

Location	VLOC
Distribution System	VDISSYS
Administrative Factor	VAD
Dispensing Factor	VDIS
Pharmacy Practice Setting	VPRAC
Regulatory Factor	VRF
Experience Factor	VEX
Delivery Factor	VDEL

1 through 8-Actual Number Ranking Assigned by Respondent
9-Nonresponse

C42-46 Consultant Pharmacist Auxiliary Factor

Record-keeping Activities	CAUXRA
Observes Medication Administration	CAUXMA
Lowest-priced Consulting Services	CAUXCS
Answers Medication Questions	CAUXMQ
Pharmaceutical Reference Materials	CAUXPRM

For Coding see Vendor Pharmacist Administrative Factor

C47-51 Consultant Pharmacist Regulatory Factor

Controlled Substances Records	CRFCS
Appropriate Storage of Drugs	CRFSD
Monthly Patient Medication Reviews	CRFMR
Inservice Education Programs	CRFIEP
Weekly Home Visits	CRFWHV

For Coding see Vendor Pharmacist Administrative Factor

C52-56 Consultant Pharmacist Administrative Factor

Initiates Written Policies	CADWP
Quarterly Written Reports	CADQWR
Pharmaceutical Services Committee	CADPSC
Utilization Review Committee	CADUR
Infection Control Committee	CADICC

For Coding see Vendor Pharmacist Administrative Factor

C57-61 Consultant Pharmacist Clinical Factor

Answers Patient Therapy Questions	CCLPT
Consults Attending Physician	CCLCAP
Attends Patient Rounds	CCLPR
Medication Histories	CCLMH
Professional Functions	CCLPF

For Coding see Vendor Pharmacist Administrative Factor

C62-66 Consultant Pharmacist Experience Factor
Other Committee Members CEXOCM
Other Health Care Professionals CEXOHC
Prior Experience CEXPEX
Professional Organizations CEXPRO
Post-graduate Degree CEXPGD
For Coding see Vendor Pharmacist Administrative Factor

C67 Consultant Pharmacist Practice Setting CPRAC1
1 Hospital Pharmacy
2 Consultant-only Pharmacy
3 Independent Community Pharmacy
4 Chain Pharmacy
5 LTCF Specialty Pharmacy
6 In-house Pharmacy
9 Nonresponse

C68 Consultant Pharmacist Location CLOC1
1 Less Than One-half Hour
2 One-half to 2 Hours
3 Greater Than 2 Hours to 6 Hours
4 Greater Than 6 Hours to 12 Hours
5 Greater Than 12 Hours to 24 Hours
9 Nonresponse

C69-75 Consultant Pharmacist Factor Ranking
Experience Factor CEX
Auxiliary Factor CAUX
Regulatory Factor CRF
Administrative Factor CAD
Clinical Factor CCL
Pharmacy Practice Setting CPRAC
Location CLOC
1 through 7-Actual Ranking Assigned by Respondent
9-Nonresponse

C76-79 Vendor and Consultant Pharmacist Services
Have Separate Contracts VCSSC
Different People VCSDP
Different Pharmacy Locations VCSDPL
No Economically Related Interests VCSERL
1 Strongly Agree
2 Agree
3 Neither Agree nor Disagree
4 Disagree
5 Strongly Disagree

C80	Position at Nursing Home	POS
1	Administrator	
2	Pharmacist	
3	Director of Nursing	
4	Medical Director	
9	Nonresponse	
C81-82	Total Years of Experience in Position	TYREXPOS
00-98	Actual Number	of Years
99	Nonresponse	
C83-84	Total Years Experience with LTCFs	TYRSEXP
00-98	Actual Number	of Years
99	Nonresponse	
C85-86	Age	AGE
00-98	Actual Number	of Years
99	Nonresponse	
C87	Gender	SEX
1	Male	
2	Female	
9	Nonresponse	

APPENDIX F

Overall Respondents' Preference for Individual Elements of the General Vendor Factors

TABLE F.1

OVERALL RESPONDENTS' PREFERENCE FOR
VENDOR EXPERIENCE FACTOR ELEMENTS

Factor Element	Mean Rank[a]	Frequency of Most Important Rank
Prior Experience with Vendor	1.93	131
Recommended by Other Health Care Professionals	2.35	60
Recommended by Other Committee Members	2.94	25
Active in Professional Organizations	3.13	34
Post-Graduate Degree	4.64	7
Total		257[b]

[a]Ranking Scale: 1=Most Important to 5=Fifth Most Important
[b]Totals 257 due to nonresponse

TABLE F.2

OVERALL RESPONDENTS' PREFERENCE FOR
VENDOR DISPENSING FACTOR ELEMENTS

Factor Element	Mean Rank[a]	Frequency of Most Important Rank
Checks on Appropriate Storage of Drugs	2.29	81
Supervises Maintenance of Appropriate Controlled Substances Records	2.31	72
Answers Medication Storage Questions	3.06	35
Lowest-Priced Dispensing Functions	3.51	42
Prepares Sterile IV Solutions	3.82	23
Total		253[b]

[a]Ranking Scale: 1=Most Important to 5=Fifth Most Important
[b]Totals 253 due to nonresponse

TABLE F.3

OVERALL RESPONDENTS' PREFERENCE FOR
VENDOR DELIVERY FACTOR ELEMENTS

Factor Element	Mean Rank[a]	Frequency of Most Important Rank
On-Call Services	1.56	149
Delivery Once Daily	2.23	76
Emergency Ordering Services	2.57	27
Delivery by Pharmacy-Owned Vehicle	3.78	4
Delivery by Third-Party Vehicle	4.36	1
Total		257[b]

[a]Ranking Scale: 1=Most Important to 5=Fifth Most Important
[b]Totals 257 due to nonresponse

TABLE F.4

OVERALL RESPONDENTS' PREFERENCE FOR
VENDOR REGULATORY FACTOR ELEMENTS

Factor Element	Mean Rank[a]	Frequency of Most Important Rank
Weekly Home Visits	2.19	99
Replaces Emergency Box, Refrigerator Box and Narcotic Box	2.22	83
Participates-Pharmaceutical Services Committee	2.50	58
Establishes Stop-Order Policy	3.72	9
Participates-Infection Control Committee	4.36	4
Total		253[b]

[a]Ranking Scale: 1=Most Important to 5=Fifth Most Important
[b]Totals 253 due to nonresponse

TABLE F.5

OVERALL RESPONDENTS' PREFERENCE
FOR VENDOR LOCATION ELEMENTS

Element	Percentage	N
Less Than One-Half Hour	67.8	177
One-Half to Two Hours	30.7	80
Greater Than Two Hours up to Six Hours	1.1	3
Greater Than Six Hours up to Twelve Hours	0.0	0
Greater Than Twelve Hours up to Twenty-four Hours	0.4	1
Totals	100.0	261

TABLE F.6

OVERALL RESPONDENTS' PREFERENCE FOR
VENDOR ADMINISTRATIVE FACTOR ELEMENTS

Factor Element	Mean Rank[a]	Frequency of Most Important Rank
Assists in Record-Keeping Activities	2.15	123
Conducts Observations of Medication Administration	2.52	66
Participates-Utilization Review Committee	3.00	43
Establishes Restricted Formulary	3.61	13
Selects Appropriate Pharmaceutical Reference Material	3.69	10
Total		255[b]

[a]Ranking Scale: 1=Most Important to 5=Fifth Most Important
[b]Totals 255 due to nonresponse

TABLE F.7

OVERALL RESPONDENTS' PREFERENCE FOR VENDOR PRACTICE SETTING ELEMENTS

Element	Percentage	N
Independent Community Pharmacy	44.2	114
LTCF Specialty Pharmacy	27.1	70
In-House Pharmacy	21.7	56
Hospital Pharmacy	5.8	15
Chain Pharmacy	1.2	3
Totals	100.0	258[a]

[a]Totals 258 due to nonresponse

APPENDIX G

Overall Respondents' Preference for Individual Elements of the General Consultant Factors

TABLE G.1

OVERALL RESPONDENTS' PREFERENCE FOR CONSULTANT CLINICAL FACTOR ELEMENTS

Factor Element	Mean Rank[a]	Frequency of Most Important Rank
Consults with the Attending Physician	2.16	82
Performs Professional Functions	2.20	92
Answers Patient Therapy Questions	2.49	65
Obtains Medication Histories	3.46	17
Accompanies Physician on Patient Rounds	4.69	3
Total		259[b]

[a]Ranking Scale: 1=Most Important to 5=Fifth Most Important
[b]Totals 259 due to nonresponse

TABLE G.2

OVERALL RESPONDENTS' PREFERENCE FOR CONSULTANT REGULATORY FACTOR ELEMENTS

Factor Element	Mean Rank[a]	Frequency of Most Important Rank
Performs Monthly Medication Reviews	1.61	168
Checks Appropriate Storage of Drugs	3.11	18
Supervises Maintenance of Appropriate Controlled Substance Records	3.40	25
Offers Inservice Education Programs	3.41	13
Weekly Home Visits	3.48	36
Total		260[b]

[a]Ranking Scale: 1=Most Important to 5=Fifth Most Important
[b]Totals 260 due to nonresponse

TABLE G.3

OVERALL RESPONDENTS' PREFERENCE FOR CONSULTANT ADMINISTRATIVE FACTOR ELEMENTS

Factor Element	Mean Rank[a]	Frequency of Most Important Rank
Initiates Written Pharmaceutical Policies and Procedures	2.22	114
Submits Quarterly Pharmaceutical Activities Written Reports	2.22	82
Participates-Pharmaceutical Services Committee	2.34	50
Participates-Utilization Review Committee	3.88	11
Participates-Infection Control Committee	4.35	1
Total		258[b]

[a]Ranking Scale: 1=Most Important to 5=Fifth Most Important
[b]Totals 258 due to nonresponse

TABLE G.4

OVERALL RESPONDENTS' PREFERENCE FOR CONSULTANT PRACTICE SETTING ELEMENTS

Element	Percentage	N
LTCF Specialty Pharmacy	35.5	91
Independent Community Pharmacy	31.3	80
In-House Pharmacy	16.0	41
Consultant-Only Pharmacy	8.2	21
Hospital Pharmacy	7.8	20
Chain Pharmacy	1.2	3
Totals	100.0	256[a]

[a]Totals 256 due to nonresponse

TABLE G.5

OVERALL RESPONDENTS' PREFERENCE FOR CONSULTANT AUXILIARY FACTOR ELEMENTS

Factor Element	Mean Rank[a]	Frequency of Most Important Rank
Conducts Observations of Medication Administration	2.03	102
Assists in Record-Keeping Activities	2.13	119
Answers Medication Storage Questions	3.06	20
Selects Appropriate Pharmaceutical Reference Material	3.73	8
Lowest-Priced Consulting Services	4.03	12
Total		255[b]

[a]Ranking Scale: 1=Most Important to 5=Fifth Most Important
[b]Totals 255 due to nonresponse

TABLE G.6

OVERALL RESPONDENTS' PREFERENCE FOR CONSULTANT LOCATION ELEMENTS

Element	Percentage	N
Less Than One-Half Hour	43.2	111
One-Half to Two Hours	46.7	120
Greater Than Two Hours up to Six Hours	7.0	18
Greater Than Six Hours up to Twelve Hours	1.2	3
Greater Than Twelve Hours up to Twenty-four Hours	1.9	5
Totals	100.0	257[a]

[a]Totals 257 due to nonresponse

APPENDIX H

Results of Kruskal-Wallis and Chi-Square Tests on Individual Elements of the Vendor Factors by Position

TABLE H.1

MEAN RANK OF VADUR[a] BY POSITION

Position	Mean Rank[b]
Administrator	3.28[c,d]
Consultant Pharmacist	2.44[c,e]
Director of Nursing	3.36[e,f]
Medical Director	2.44[d,f]

[a]Vendor Administrative Factor--Participates on Utilization Review Committee

[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important

Mann-Whitney U tests

[c,e] significantly different at alpha $\leq$ 0.001

[d,f] significantly different at alpha $\leq$ 0.01

TABLE H.2

MEAN RANK OF VADRF[a] BY POSITION

Position	Mean Rank[b]
Administrator	3.25[c,d]
Consultant Pharmacist	3.98[c]
Director of Nursing	3.55
Medical Director	4.03[d]

[a]Vendor Administrative Factor--Establishes a Restricted Formulary

[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important

Mann-Whitney U tests

[c]significantly different at alpha $\leq$ 0.001

[d]significantly different at alpha $\leq$ 0.01

TABLE H.3

MEAN RANK OF VEXPEX[a] BY POSITION

Position	Mean Rank[b]
Administrator	1.92
Consultant Pharmacist	1.57[c]
Director of Nursing	2.23[c]
Medical Director	1.82

[a]Vendor Experience Factor--Prior Experience
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.01

TABLE H.4

MEAN RANK OF VEXPRO[a] BY POSITION

Position	Mean Rank[b]
Administrator	3.29[c]
Consultant Pharmacist	3.43[d]
Director of Nursing	2.85[c,d]
Medical Director	2.97

[a]Vendor Experience Factor--Active in Professional Organizations
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,d]significantly different at alpha $\leq$ 0.05

TABLE H.5

MEAN RANK OF **VEXPGD**[a] BY POSITION

Position	**Mean Rank**[b]
Administrator	4.67
Consultant Pharmacist	4.85[c,d]
Director of Nursing	4.52[c]
Medical Director	4.52[d]

[a]Vendor Experience Factor--Post-Graduate Degree
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.05
[d]significantly different at alpha $\leq$ 0.01

TABLE H.6

MEAN RANK OF **VDELOCS**[a] BY POSITION

Position	**Mean Rank**[b]
Administrator	1.52[c]
Consultant Pharmacist	1.91[c,d,e]
Director of Nursing	1.41[d]
Medical Director	1.44[e]

[a]Vendor Delivery Factor--On-Call Services
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.01
[d]significantly different at alpha $\leq$ 0.001
[e]significantly different at alpha $\leq$ 0.05

TABLE H.7

MEAN RANK OF VDELPOV[a] BY POSITION

Position	Mean Rank[b]
Administrator	3.60[c,d]
Consultant Pharmacist	3.85[c]
Director of Nursing	3.90[d]
Medical Director	3.74

[a]Vendor Delivery Factor--Delivery by Pharmacy-Owned Vehicle
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.05
[d]significantly different at alpha $\leq$ 0.01

TABLE H.8

MEAN RANK OF VDISSD[a] BY POSITION

Position	Mean Rank[b]
Administrator	1.95[c,d,e]
Consultant Pharmacist	2.55[c]
Director of Nursing	2.34[d]
Medical Director	2.53[e]

[a]Vendor Dispensing Factor--Checks Appropriate Storage of Drugs
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.01
[d,e]significantly different at alpha $\leq$ 0.05

TABLE H.9

MEAN RANK OF VDISMQ[a] BY POSITION

Position	Mean Rank[b]
Administrator	3.45[c]
Consultant Pharmacist	2.41[c,d]
Director of Nursing	3.21[d]
Medical Director	2.94

[a]Vendor Dispensing Factor--Answers Medication Storage Questions
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,d]significantly different at alpha $\leq$ 0.001

TABLE H.10

PREFERENCE FOR TYPE OF

DISTRIBUTION SYSTEM BY POSITION[a]

	Type of Distribution System		
Position	Traditional	Modified Traditional	Unit-Dose
Administrator	10.3% (8)	34.6% (27)	55.1% (43)
Consultant Pharmacist	13.8% (8)	56.9% (33)	29.3% (17)
Director of Nursing	16.9% (15)	31.5% (28)	51.7% (46)
Medical Director	12.1% (4)	42.4% (14)	45.5% (15)
Averages and Totals	13.6% (35)	39.5% (102)	46.9% (121)

[a]Chi-square=13.23 (df=6; p=0.04)

APPENDIX I

Results of Kruskal-Wallis Tests on Individual Elements of the Consultant Factors by Position

TABLE I.1

MEAN RANK OF CAUXRA[a] BY POSITION

Position	Mean Rank[b]
Administrator	1.87[c]
Consultant Pharmacist	2.50[c,d]
Director of Nursing	2.08[d]
Medical Director	2.24

[a]Consultant Auxiliary Factor--Assists in Record-Keeping Activities
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.01
[d]significantly different at alpha $\leq$ 0.05

TABLE I.2

MEAN RANK OF CAUXMQ[a] BY POSITION

Position	Mean Rank[b]
Administrator	3.27[c]
Consultant Pharmacist	2.67[c,d,e]
Director of Nursing	3.12[d]
Medical Director	3.15[e]

[a]Consultant Auxiliary Factor--Answers Medication Storage Questions
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.01
[d,e]significantly different at alpha $\leq$ 0.05

TABLE I.3

MEAN RANK OF CRFCS[a] BY POSITION

Position	Mean Rank[b]
Administrator	3.07[c,d]
Consultant Pharmacist	3.60[c]
Director of Nursing	3.56[d]
Medical Director	3.35

[a]Consultant Regulatory Factor--Supervises Maintenance of Appropriate Controlled Substances Records
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,d]significnatly different at alpha $\leq$ 0.05

TABLE I.4

MEAN RANK OF CRFSD[a] BY POSITION

Position	Mean Rank[b]
Administrator	2.94[c]
Consultant Pharmacist	3.33[d]
Director of Nursing	3.32[c,e]
Medical Director	2.62[d,e]

[a]Consultant Regulatory Factor--Checks on Appropriate Storage of Drugs
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,e]significantly different at alpha $\leq$ 0.05
[d]significantly different at alpha $\leq$ 0.01

TABLE I.5

MEAN RANK OF CRFMR[a] BY POSITION

Position	Mean Rank[b]
Administrator	1.66[c,d]
Consultant Pharmacist	1.22[c,e,f]
Director of Nursing	1.60[e,g]
Medical Director	2.21[d,f,g]

[a]Consultant Regulatory Factor--Performs Monthly Medication Reviews
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,e,g]significantly different at alpha $\leq$ 0.01
[d]significantly different at alpha $\leq$ 0.05
[f]significantly different at alpha $\leq$ 0.001

TABLE I.6

MEAN RANK OF CADPSC[a] BY POSITION

Position	Mean Rank[b]
Administrator	2.40
Consultant Pharmacist	2.14[c]
Director of Nursing	2.53[c,d]
Medical Director	2.00[d]

[a]Consultant Administrative Factor--Participates on Pharmaceutical Services Committee
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,d] significantly different at alpha $\leq$ 0.01

TABLE I.7

MEAN RANK OF CADICC[a] BY POSITION

Position	Mean Rank[b]
Administrator	4.20[c]
Consultant Pharmacist	4.59[c,d]
Director of Nursing	4.32[d]
Medical Director	4.31

[a]Consultant Administrative Factor--Participates on Infection Control Committee
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.001
[d]significantly different at alpha $\leq$ 0.05

TABLE I.8

MEAN RANK OF CCLPT[a] BY POSITION

Position	Mean Rank[b]
Administrator	2.78[c]
Consultant Pharmacist	2.02[c,d,e]
Director of Nursing	2.49[d]
Medical Director	2.70[e]

[a]Consultant Clinical Factor--Answers Patient Therapy Questions
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.001
[d]significantly different at alpha $\leq$ 0.05
[e]significantly different at alpha $\leq$ 0.01

TABLE I.9

MEAN RANK OF CCLCAP[a] BY POSITION

Position	Mean Rank[b]
Administrator	1.91[c]
Consultant Pharmacist	2.43[c]
Director of Nursing	2.17
Medical Director	2.27

[a]Consultant Clinical Factor--Consults Directly with the Attending Physician

[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important Mann-Whitney U tests

[c]significantly different at alpha $\leq$ 0.01

TABLE I.10

MEAN RANK OF CCLPR[a] BY POSITION

Position	Mean Rank[b]
Administrator	4.86[c]
Consultant Pharmacist	4.45[c,d]
Director of Nursing	4.77[d]
Medical Director	4.53

[a]Consultant Clinical Factor--Accompanies Physician on Patient Rounds

[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important Mann-Whitney U tests

[c,d] significantly different at alpha $\leq$ 0.01

TABLE I.11

MEAN RANK OF CCLMH[a] BY POSITION

Position	Mean Rank[b]
Adminstrator	3.35[c]
Consultant Pharmacist	3.93[c,d,e]
Director of Nursing	3.39[d]
Medical Director	3.06[e]

[a]Consultant Clinical Factor--Obtains Medication Histories from Residents
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,d,e]significantly different at alpha $\leq$ 0.001

TABLE I.12

MEAN RANK OF CEXOHC[a] BY POSITION

Position	Mean Rank[b]
Adminstrator	2.08[c,d]
Consultant Pharmacist	2.19[e]
Director of Nursing	2.44[c,f]
Medical Director	3.00[d,e,f]

[a]Consultant Experience Factor--Recommended by Other Health Care Professionals
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,f]significantly different at alpha $\leq$ 0.05
[d]significantly different at alpha $\leq$ 0.001
[e]significantly different at alpha $\leq$ 0.01

TABLE I.13

MEAN RANK OF CEXPGD[a] BY POSITION

Position	Mean Rank[b]
Administrator	4.68[c]
Consultant Pharmacist	4.93[d,e]
Director of Nursing	4.56[d,f]
Medical Director	4.19[c,e,f]

[a]Consultant Experience Factor--Has a Post-Graduate Degree
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,d]significantly different at alpha $\leq$ 0.01
[e]significantly different at alpha $\leq$ 0.001
[f]significantly different at alpha $\leq$ 0.05

APPENDIX J

Results of Kruskal-Wallis and Chi-Square Tests on Individual Elements of the Vendor Factors by Ownership Type

TABLE J.1

MEAN RANK OF VRFWHV[a] BY OWNERSHIP TYPE

Ownership Type	Mean Rank[b]
Nonprofit	2.52[c,d]
For-Profit	2.04[c]
Governmental	1.98[d]

[a]Vendor Regulatory Factor--Weekly Home Visits
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,d]significantly different at alpha $\leq$ 0.05

TABLE J.2

MEAN RANK OF VRFSOP[a] BY OWNERSHIP TYPE

Ownership Type	Mean Rank[b]
Nonprofit	3.47[c]
For-Profit	4.03[c,d]
Governmental	3.56[d]

[a]Vendor Regulatory Factor--Establishes an Automatic Stop-Order Policy
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,d]significantly different at alpha $\leq$ 0.01

TABLE J.3

MEAN RANK OF **VDELOCS**[a] BY OWNERSHIP TYPE

Ownership Type	**Mean Rank**[b]
Nonprofit	1.77[c]
For-Profit	1.41[c]
Governmental	1.51

[a]Vendor Delivery Factor--On-Call Services
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.01

TABLE J.4

MEAN RANK OF **VDISSD**[a] BY OWNERSHIP TYPE

Ownership Type	**Mean Rank**[b]
Nonprofit	2.51[c,d]
For-Profit	2.22[c]
Governmental	2.10[d]

[a]Vendor Dispensing Factor--Checks on Appropriate Storage of Drugs
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,d]significantly different at alpha $\leq$ 0.05

TABLE J.5

MEAN RANK 0F VDISIV[a] BY OWNERSHIP TYPE

Ownership type	Mean Rank[b]
Nonprofit	3.47[c]
For-Profit	3.93
Governmental	4.13[c]

[a]Vendor Dispensing Factor--Prepares Sterile IV Solutions
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.01

TABLE J.6

PREFERENCE FOR TYPE OF DISTRIBUTION SYSTEM BY OWNERSHIP TYPE[a]

	Type of Distribution System		
Ownership Type	Traditional	Modified Traditional	Unit-Dose
Nonprofit/Governmental	9.0% (14)	43.9% (68)	47.1% (73)
For-Profit	20.2% (21)	33.7% (35)	46.2% (48)
Averages and Totals	13.5% (35)	39.8% (103)	46.7% (121)

[a]Chi-square=7.38 (df=2; p=0.02)

APPENDIX K

Results of Kruskal-Wallis and Chi-Square Tests on Individual Elements of the Vendor Factors by Bed Size Category

TABLE K.1

MEAN RANK OF **VRFSOP**[a] BY BED SIZE CATEGORY

Bed Size Category	**Mean Rank**[b]
Less than 100	3.81[c]
100 to 200	3.79[d]
Greater than 200	3.26[c,d]

[a]Vendor Regulatory Factor--Establishes an Automatic Stop-Order Policy

[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important

Mann-Whitney U tests

[c,d]significantly different at alpha $\leq$ 0.01

TABLE K.2

MEAN RANK OF **VRFPSC**[a] BY BED SIZE CATEGORY

Bed Size Category	**Mean Rank**[b]
Less than 100	2.45[c]
100 to 200	2.41[d]
Greater than 200	2.92[c,d]

[a]Vendor Regulatory Factor--Participates on Pharmaceutical Services Committee

[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important

Mann-Whitney U tests

[c,d]significantly different at alpha $\leq$ 0.05

TABLE K.3

MEAN RANK OF VRFICC[a] BY BED SIZE CATEGORY

Bed Size Category	Mean Rank[b]
Less than 100	4.29[c]
100 to 200	4.32[d]
Greater than 200	4.71[c,d]

[a]Vendor Regulatory Factor--Participates on Infection Control Committee
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.01
[d]significantly different at alpha $\leq$ 0.05

TABLE K.4

MEAN RANK OF VDELPOV[a] BY BED SIZE CATEGORY

Bed Size Category	Mean Rank[b]
Less than 100	3.91[c,d]
100 to 200	3.71[c]
Greater than 200	3.63[d]

[a]Vendor Delivery Factor--Delivery by a Pharmacy-Owned Vehicle
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,d]significantly different at alpha $\leq$ 0.05

TABLE K.5

PREFERENCE FOR DISTRIBUTION SYSTEM BY BED SIZE CATEGORY[a]

	Type of Distribution System		
Bed Size Category	**Traditional**	**Modified Traditional**	**Unit-Dose**
Less than 100	27.8% (30)	32.4% (35)	39.8% (43)
100 to 200	4.5% (5)	44.6% (50)	50.9% (57)
Greater than 200	0.0% (0)	46.2% (18)	53.8% (21)
Averages and Totals	13.5% (35)	39.8% (103)	46.7% (121)

[a]Chi-square=32.80 (df=4; p=0.0001)

TABLE K.6

PREFERENCE FOR VENDOR PHARMACIST LOCATION BY BED SIZE CATEGORY[a]

	Vendor Pharmacist Location	
Bed Size Category	**Less than One-half Hour**	**One-half Hour or Greater**
200 or less	70.6% (156)	29.4% (65)
Greater than 200	52.5% (21)	47.5% (19)
Averages and Totals	67.8% (177)	32.2% (84)

[a]Chi-square=5.08 (df=1; p=0.02)

APPENDIX L

Results of Kruskal-Wallis and Chi-Square Tests on Individual Elements of the Consultant Factors by Bed Size Category

TABLE L.1

MEAN RANK OF CADQWR[a] BY BED SIZE CATEGORY

Bed Size Category	Mean Rank[b]
Less than 100	2.02[c,d]
100 to 200	2.28[c]
Greater than 200	2.63[d]

[a]Consultant Administrative Factor--Submits Quarterly Pharmaceutical Activities Written Reports
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c]significantly different at alpha $\leq$ 0.05
[d]significantly different at alpha $\leq$ 0.01

TABLE L.2

MEAN RANK OF CEXPGD[a] BY BED SIZE CATEGORY

Bed Size Category	Mean Rank[b]
Less than 100	4.79[c,d]
100 to 200	4.54[c]
Greater than 200	4.49[d]

[a]Consultant Experience Factor--Has a Post-Graduate Degree
[b]Ranking Scale: 1=Most Important to 5=Fifth Most Important
Mann-Whitney U tests
[c,d]significantly different at alpha $\leq$ 0.05

TABLE L.3

PREFERENCE FOR CONSULTANT PHARMACIST LOCATION BY BED SIZE CATEGORY[a]

Bed Size Category	Consultant Pharmacist Location: Less than One-half Hour	Consultant Pharmacist Location: One-half Hour or Greater
Less than 100	48.1% (52)	51.9% (56)
100 to 200	45.0% (50)	55.0% (61)
Greater than 200	23.7% (9)	76.3% (29)
Averages and Totals	43.2% (111)	56.8% (146)

[a]Chi-square=7.13 (df=2; p=0.03)