A SURVEY OF THE MEDICATIONS ORDERED AND ADMINISTERED IN THE MEDICAL AND SURGICAL DEPARTMENTS OF A SELECTED GENERAL HOSPITAL FOR POSSIBLE IMPLICATIONS FOR COURSE PLANNING IN PHARMACOLOGY FOR NURSING STUDENTS

by

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PREFACE

The selection of this study is a result of the writer's interest in the teaching of pharmacology to nursing students, and her concern for the importance of this course in the nursing curriculum. The decision to develop this study stemmed from a desire to investigate the status of drug therapy as it relates to the activities of student nurses in a selected situation, and indicates the extent of the students' need for knowledge about drugs in common usage.

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CHAPTER I

OVERVIEW OF THE STUDY

Introduction to the Problem

In planning a course in pharmacology for nursing students, there are many problems to be considered in order to meet the objectives as formulated by the teacher, and the needs as experienced by the student.

What can best be used as a guide in preparing a syllabus for teaching pharmacology? If the course is to be subject-centered and taught from the textbook, on what basis is a text selected and on what content areas will the emphasis be placed? If the course is to be experience-centered and designed to meet the students' diverse needs, how can these needs be identified?

It would seem reasonable and necessary that the teacher whose responsibility it is to present pharmacology to nursing students be well informed on the general aspects of pharmacology and the established modes of drug therapy. Moreover, it is practical and desirable that she be cognisant of the specific and current practices relative to drug therapy in the situation in which she and the students are functioning.

Purpose

The purpose of this study will be an effort to identify certain essential content of the course in pharmacology by means of a survey of the medications ordered and administered in the medical and surgical departments of a selected general hospital.

It is presumed that with the aid of such information the course in pharmacology could be more closely planned to relate to those activities and experiences in the clinical areas in which the students are receiving their instruction and participating in patient care.

The teaching and learning of pharmacology present a continually changing and challenging problem in the acquisition of fundamental and foundation knowledge for operational safety, as well as progressive learning in relation to new medications which come into clinical use with great frequency and variety. In perusing the classified section of positions available for nurses in the nursing journals, it might be presumed that instructors are seldom employed specifically and primarily for the teaching of pharmacology, though their ability and/or willingness to do so may be a desirable factor. The trend seems to be toward employing instructors for a specific area, such as foundations of nursing, medical and surgical nursing, maternal and child health nursing, psychiatric nursing and public health nursing, or for teaching the sciences, or the so-called non-clinical courses. Pharmacology is related to them all.

There are many textbooks on pharmacology for nursing students, some of which provide annual supplements to keep them up-to-date.

Printed information about drugs is available from various sources and in voluminous quantities. The difficulty is that of selecting what might be considered important and essential content from an almost over-abundant supply and arranging an order of presentation which is essential and logical to learning in the actual situation.

How the course in pharmacology can be made more interesting, more practical, and more vital to the learner, has long been of some concern in schools of nursing. Various aids and approaches to teaching have been projected. Suggestions of methods and technics to stimulate interest and facilitate learning have been advanced. The pros and cons of "integration" versus "correlation" have been discussed at length, with the goal of better relating the study of pharmacology to the clinical practice of the students.

Perhaps this is the time to return to the "what" and "when" of course planning. Knowledge of the medications in current use, their frequency of ordering by the physician and administration by the nurse, should be of primary significance in the establishment of objectives, selection of course content, determination of sequence of presentation, and realization of the role of the nurse in regard to drug therapy. A more functional approach should make the course more meaningful and engender attitudes, on the part of the instructors and students, which are conducive to the improved teaching and learning of pharmacology.

Definition of Terms

For purposes of this presentation, the following definitions are employed:

1) pharmacology	knowledge of drugs with emphasis on their action in the body (and use in the treatment of disease).
2) nursing student or student nurse	refers to the student enrolled in a professional school of nursing, either diploma or degree.
3) graduate nurse, professional nurse, or registered nurse	refers to the graduate of a professional school of nursing which is accredited by the State Board of Nursing, and who has successfully passed a licensing examination.
4) clinical practice	observation and practice in a hospital unit in activities which will enable the student to achieve the ability to plan and give nursing care to patients.
5) correlation	an attempt to unify the student's learning by parallel teaching of related subjects or areas.(22,33)
6) integration	an attempt to unify the student's learning by fusing related subjects in their teaching.(22,33)

Limitations of the Study

This study is limited to:

1) a survey to ascertain those medications which appear on the Kardexes and nurses' notes of the charts on the active census of patients confined to the medical and surgical departments of one selected general hospital.

2) data collected over a period of approximately eight weeks.

3) those medications which would in the selected situation be administered by the nurses, student and graduate, assigned to the care of these patients. In so doing, drugs such as anesthetics and those administered by the intravenous route would thereby be excluded.

Assumptions

For purposes of this study, it is assumed that:

1) improving the course planning and presentation in pharmacology is a problem worthy of study;

2) the nursing student needs extensive knowledge of commonly used drugs in order to function with safety and efficiency;

3) rapid advances and changes in drug therapy have expanded, and continue to expand, the nurse's need for knowledge about drugs;

4) it is necessary to eliminate some of the content in the pharmacology course for nursing students which has become outdated in its usefulness in order to make way for the new;

5) the medical and surgical departments, representing the two largest segments of the said selected general hospital, will yield the greatest variety in age and diagnosis of its patient-occupants, as well as the largest number and variety of medications;

6) the data yielded from a survey in the medical and surgical departments of one general hospital will be reasonably representative of those which might conceivably be found in comparable departments

of other hospitals of a similar nature in the same geographic area, as well as in the country, at a given time;

7) a survey can provide a basis for obtaining information useful for promoting better correlation between classroom teaching and clinical practice, thus facilitating integration of learning;

8) certain other curriculum considerations and revisions may well be relevant to the placement and teaching of the course content in pharmacology;

9) the acquisition of functional knowledge will assist the nursing student to develop greater skill and security in the administration of effective nursing care.

Importance of the Problem

There is relatively little in the professional literature regarding the teaching of pharmacology per se. More emphasis is being placed on the patient-centered aspects of nursing care within the clinical areas. Why then should the clinical applications not be identified in pharmacology?

The Clearing House for Studies in Nursing[1] indicates that most of the studies relevant to pharmacology have centered around the need for mathematical skills and the analysis of medication errors. The two important intermediary activities between the above are the teaching of pharmacology and the administration of medications by the student. A survey of medications in current use will help direct the teaching efforts along more pertinent lines which will be

more evident to the student nurse on the basis of her opportunities to apply the knowledge.

Some nursing students consider the learning of pharmacology to be largely a matter of committing to memory vast numbers of names of drugs and their dosages. The following are quotes from students' comments on a course in pharmacology when asked specifically what might be done to improve the course:

> I think we went through some things in class about drugs we will (probably) never give and we should have been using our time on the more important drugs.
>
> I think going up on the floor in groups and looking through the medicines is a good idea, especially for the floor you haven't worked on yet, like Medical if you are on Surgical. This should be done as you study a particular group of drugs, such as going to the Medical floor when you are studying drugs which affect the cardio-vascular system. 'Seeing is believing', you know.
>
> More application of drugs to patients and symptoms.
>
> If something could be done to make us use these drugs, it would be more interesting.
>
> The learning of drugs is always difficult until one has administered them a few times. If this could somehow be made easier, the class would be perfect.
>
> Study drugs pertaining to the area in which we are working.
>
> All we talk about in class is dosages, administration, etc.; mostly, anyway!
>
> More time for discussion about medication problems.

This would seem to indicate that as far as the learner is concerned, it would be most desirable and most meaningful to provide for some closer relationship between the classroom approach to pharmacology and the students' activities in clinical areas.

At the point in the nursing curriculum when pharmacology is usually scheduled to be taught, nursing students are about to enter, or have entered, an area of clinical practice, most commonly medical and/or surgical. Today, the trend is toward patient-centered teaching. Efforts are made to correlate classroom teaching with clinical experience. Patients with specific diagnoses and problems are selected and their individual situations are related to the acquisition of theoretical learning. Typical cases described in the textbooks are compared with actual patients on the wards. A similar, direct application can be made with pharmacology if the medications given on the ward are identified. Pre-planning, through a survey of medications ordered and administered, should help to accomplish a closer relationship between what is learned in the classroom in pharmacology and what is practiced in the clinical areas.

Textbooks in pharmacology tend to be so inclusive in their content that much is superfluous--at least to the present time and place of usage. Range of dosage in the books may differ slightly from those ordered and administered on the ward. Dosages may be given in one system in the textbook and another on the patient's chart or Kardex. Trade names cause particular confusion for the neophyte in pharmacology.

Many medications are ordered "p.r.n.". Some are administered very frequently, others quite infrequently. These are perhaps the medications which impose the largest judgmental responsibility upon those who administer them, and hence indicate an area of needed

emphasis in the teaching. If even some of these problems which confront the student nurse in the administration of medications could be anticipated in advance, more direct correlation could be planned for between pharmacology in the classroom and in the ward situations. A survey would help to identify such problems and give direction to resolving them.

Procedure for the Study

The procedure for this study may be depicted in the following series of steps:

1. Suitable objectives will be established and a design for study developed and approved.
2. Administrative clearance to pursue the study in the selected areas will be secured from the director of nursing and other appropriate personnel.
3. A tentative form for collecting the data will be devised.
4. A trial run for collecting the data will be made.
5. Revisions will be made to develop a final form for the collection of data.
6. A schedule will be determined for the collection of data.
7. The data will be collected at the established times.
8. Categories will be selected for the tabulation of the data.
9. Tabulation of the data will be made according to selected categories.

10. The findings will be interpreted, conclusions drawn, and recommendations, if any, formulated.

Possible Outcomes

Possible outcomes of this study might include:

1. Evaluation and revision of the course content in pharmacology for nursing students.
2. Reorganization of sequence of presentation of the course, attempting closer relationship of course content to practice.
3. Some new types of student learning activities may be devised to assist in identifying and learning new drugs in use on clinical services.
4. Greater interest in pharmacology on the part of the student as the result of identifying functional relationships between knowledge acquired in the classroom and experiences on the clinical services.
5. Increased understanding of pharmacology on the part of the nursing students resulting in improved understanding of drug therapy as it relates to patients and their total care.
6. Consideration of curriculum change to provide for closer relationship between medical and surgical nursing and pharmacology for nursing students.

7. Promotion of closer cooperation between instructors in the medical and surgical areas and the instructor of pharmacology in the planning of content in each of these courses.
8. Additional surveys of this nature being made on a limited scale at intervals, in order to keep the course in pharmacology up-to-date.

CHAPTER II

REVIEW OF LITERATURE

Curriculum in General Education

Curriculum development, revision and reorganization continues to be a matter of major concern to educators in both general and special education. There are voluminous quantities of literature devoted to the problem, and considerable diversity exists with regard to the various patterns and paths which may result in that kind of education which best contributes to the development of the learner.

Since 1901, when Thorndike and other experimentalists began scientific inquiry into the whole question of transfer of training, there has come about considerable modification and revision of the old formal discipline theory.

It is now generally accepted that there is no wholesale transfer of learning. Transfer takes place only insofar as there are identical components, e.g.:

a) identity of content,

b) identity of procedure,

c) identity of ideas or attitudes.

It is valuable, therefore, to organize learning as it is learned from day to day and experience to experience.(3)

From Averill and Kempf comes this explanation of the Law of Association. "Of two things previously experienced together, the entrance of one into the mind tends to draw on the other also." This is Aristotle's old "Law of Contiguity", and upon its operation is based all learning and all recalling. If a thing is to be remembered, it must be associated contiguously with something else; if it is to be recalled it must be recalled contiguously with the former associated idea. From this point of view, all that teaching consists of is setting the stage of learning in such a way that those things which are to be remembered shall be experienced together by the pupil. It is agreed for the most part that the more rich and numerous the associations, the more varied and elaborate the mental life becomes.(3)

Burton elaborates on this concept in his ideas on the guidance of learning activities. He proceeds further to identify the three most important characteristics of one integrating learning situation as being:

1) a purpose and end which has value,

2) a continuous and simultaneous interrelationship of learning activities in a useful way, and

3) interaction with the environment.(5)

It is up to the individual teacher to identify the goals, point out the interrelationships, and make provision for opportunities for interaction with the environment. The learner, being made aware of these facts, can then utilize them to the best advantage.

In preparing to develop any aspect of curriculum, the teacher is confronted with the question of what to include. Smith, Stanley and Shores describe the procedures for content selection as ranging from "practical reason to rigorous scientific investigation".(31)

Of the four procedures for content selection discussed by Smith, Stanley and Shores in Fundamentals of Curriculum Construction,--judgmental, experimental, analytical, and consensual--the analytical procedure, which is one of the more widely known methods of content selection, is most significant to this paper. The analytical procedure has been most closely identified with the criterion of utility. It consists of an analysis of the things people do in order to discover the subject matter functioning in these activities.(31)

Again, according to Smith, Stanley and Shores, the "ultimate basis of subject matter selection should rest with the determination of objectives". However, certain criteria for selection of curriculum content have been formulated which can be used alone or in combination by different curriculum workers. These are expressed in the following questions.

1) Is the subject matter significant to an organized field of knowledge?

2) Does the subject matter stand the test of survival?

3) Is the subject matter useful?

4) Is the subject matter interesting to the learner?

5) Does the subject matter contribute to the growth and development of a democratic society?(31)

An additional matter of concern in curriculum or course development is sequence. Usefulness as a determinant of sequence refers to the immediate functional value of materials and activities. Though no knowledge can be considered useless, nonetheless, there are times when it can be more or less useful.

Interest is an undeniably important element, inasmuch as interests are acquired through the impact of the total environment upon the individual. It would seem wise, then, to capitalize on the related experience in the selected environment.(31)

The matter of motivation cannot go unconsidered. With regard to motivation of learning, about the same law governs the intellect as the stomach. "The hungrier the man, the more ravenously he eats." It is desirable, therefore, that there should exist consciously in the mind of the learner an awareness of the need of the material which appears in his educational menu, and a readiness to attack it. Then does learning become interesting and challenging.(3)

Burton relates this matter of motivation to the method of teaching by stating that "a good learning situation consists of a rich and varied series of learning experiences unified around a vigorous purpose, and carried on in interaction with a rich, varied, and provocative environment."(5)

An awareness of the opportunities and activities available in the environment is necessary to the teaching role. This provides for a common focus of interest and unity of approach.

"A learning experience which is unified around a purpose real to the learner and which is continuous, simultaneous, and interactive with the environment is said to be an integrating experience." Such learnings become a part of the individual and not something memorized for the sake of repetition on demand. (5)

Curriculum in Nursing Education

Problems of curriculum in nursing education parallel those of general education. The 1956 Yearbook of Modern Nursing says the following about curriculum planning and construction:

> To be adequate for any school of nursing, a curriculum, no matter how good, must undergo continuing development.(7)

A similar thought is found in an editorial entitled, "Were the Good Old Days Really Good?", Nursing Outlook, July, 1956.

> Nurse educators are caught in a trap of trying to teach new and vital skills and technics in addition to the traditional skills and technics which are part of nursing. The traditional curriculum was already crowded, and many things in it are still important, but the new technics and knowledge must be added.(9)

It must be agreed that "the nurse, like any other professional person, should have the best possible fund of useful information."(13) It then becomes the task of those responsible for the education of nursing students to seek out that information which might be considered most useful.

In planning for correlation in the nursing curriculum, it has been recommended by Hall that all who teach need to:

1) plan selected experiences at the bedside which provide opportunities for problem-solving and application of scientific knowledge;

2) be familiar with the total curriculum in order to provide for correlation in all clinical areas; and

3) organize for continuity, sequence, and integration.(17)

There is a constant need to examine content, discuss, rearrange, and insert or delete material each time it is taught if it is to remain most pertinent.

Dr. Dorothy Johansen, noted educator and history professor from Reed College, expresses herself on teaching thusly:

> Now we not only consider our bodies of knowledge to be only tentatively 'true' and exact, but we also realize that information learned in isolated fragments does not contribute to our understanding of the whole phenomenon, whether it is the social body or the human body.

Cross reference enriches and helps the student gain a more meaningful understanding.(22)

Jewett cautions teachers against overconcern with method instead of content. Teaching decays, he says, when substance is forsaken for the form, the matter for the method.

> The practical danger is this—we are likely to become so wrapped up in technics and aids and devices that we forget the real purpose we are trying to accomplish. Whether our aim is to teach certain facts, to generate broad understandings, to arouse and purify aesthetic appreciations, or to develop character—whatever our aim may be it is why we are in the classroom, and all the methods at our disposal exist for its sake.(21)

Students need help in acquiring essential information. They need the significant and interesting aspects pointed out to them.

Another editorial from the Nursing Outlook of February, 1955, entitled "Challenge of Teaching", advocates that the individual teacher scrutinize her performance and be flexible, so as to adjust each course and method to the needs of each new group.(8)

Though student evaluation cannot be considered an ultimate measure of merit, it is certainly a measure ofreaction to teaching. In a study of students' opinions about their teachers by Professor Edwin R. Guthrie at the University of Washington, five traits were demonstrated as characterizing a good teacher. The good teacher:

1) is clear and understandable in his explanations;

2) takes an active, personal interest in the progress of his class;

3) is friendly and sympathetic in manner;

4) shows interest and enthusiasm in his subject; and

5) gets students interested in his subject.

An additional trait identified in this study was "has knowledge of his subject". It actually placed second on the survey but was omitted because of extremely little agreement among first year students and substantial agreement only reached by fourth year and graduate students.(16)

Professor Guthrie maintains that poor teaching is more often due to neglect of good teaching practices than to the teacher's personality defects. Improvement usually requires two things:

1) awareness that there is need for improvement, and

2) knowledge of outstanding faults.(16)

In preparing to teach, it is important for each teacher to consider the content being taught, the suitability of the method to the material, the objectives in view, the characteristics of the learner, and the needs of the learner.

Pharmacology in the Nursing Curriculum

In the preface to the pharmacology text of which she is co-author, Faddis says:

> The nurse studies pharmacology so that she may be fitted to assume her responsibilities in the care of patients who are being treated with drugs.(13)

Inasmuch as it is the rare patient who does not receive some drug therapy for his disease, the administration of medications is an important function of the nurse.

With the intensely rapid addition of new drugs and entire new drug groups, the learning and teaching of pharmacology becomes increasingly complex. In order to administer drugs with safety, the nurse must know specific things about them.

There is an endless fund of information to be acquired. From the animal, vegetable and mineral sources came the classic drugs which formed the original basis of drug therapy since materia medica was first taught. Many new drugs continue to be derived from these sources as man with the aid of science can see more and refine further. There was only one antibiotic in 1926. Today the antibiotics constitute a group where new ones are replacing or reinforcing old ones with almost cyclic rhythm. The vitamins have become almost as

common to the kitchen as salt, but much more complex. An infinite realm was opened with the advent of the synthetics.

That there is a continual need to learn is self-evident. Rather, the question revolves about what to learn, for as well as the pool of perennial drugs, there is a constant flow of new drugs. The teacher needs some guide to help determine the selection of specific content for the course in pharmacology for nursing students and some indication to the establishment of sequence of presentation.

Since the end of the 1940's, there has been a relative paucity in the literature of professional nursing regarding the teaching of pharmacology per se. This is not because the many problems in the area have been solved. Persistent and recurrent problems are ever present. They are referrable to:

1) determination of content,
2) identification of new drugs,
3) lessening of medication errors,
4) motivation in learning,
5) time and sequence of presentation, and
6) appropriate methods of teaching.

The American Nurses' Association Clearing House for Studies in Nursing 1950-1953 and Supplement 1954-1955, lists only thirteen studies directly related to pharmacology written between 1930 and 1955. Three of these are concerned with medication errors, two with mathematical skills, two with procedural aspects of medicine administration, two with histo-biological problems, one with cost,

and one an experimental study to determine the effectiveness of integrating the social and health aspects in the teaching of pharmacology. The two which might seem allied to this study are: Keeping Up with Modern Drugs, School of Nursing, Washington University, St. Louis, Missouri; and The Effect of Experience on Achievement in Pharmacology and Therapeutics, master's thesis by Sister Aline Rihm, Catholic University of America, School of Nursing Education, Washington, D.C.(1)

Further searching in the official professional nursing publications, The American Journal of Nursing, Nursing Outlook, and Nursing Research, yielded no description of, or reference to, studies in the area of pharmacology done during this same period, 1930-1955. Nursing Research, which has assumed the official task of listing theses and similar studies, indicates that two studies referrable to pharmacology were submitted in 1956, and another in 1958.

Of the two completed in 1956, one was titled A Quantitative Study of the Treatments and Medications Currently Employed in the Care of Intrapartum and Postpartum Patients, Sister Margaret Walsh, Catholic University of America.(32) The other was a Study of Some of the Treatments and Medications Currently Ordered for Medical and Surgical Patients in a Selected General Hospital, Sister Natividad Asumsion, also of Catholic University. (2) The one completed in 1958 was a Study of the Frequency of Reported Medication Errors among Practical Nurses in a General Hospital by Mary Lodge, Wayne State University.(25)

These papers were not reviewed because of their rather indirect relationship to this study.

Exploration of other nursing publications for literature on the subject yielded a rather limited amount.

From a paper published in the Federation Proceedings, Volume 12, 1953, Meek states that mastery of a textbook was considered the framework on which future knowledge could be hung, accepting that as years go by much will be replaced. However, the enormous current output of scientific literature about drugs constitutes a problem requiring alertness to see and adopt all that is new.(26)

There have been various attempts to reorganise the course content and learning experiences of pharmacology for nursing students. According to Hoblitzelle, most of them have been directed toward:

1) reducing the number of errors in computing dosage,

2) making the course more meaningful to students,

3) eliminating duplication of effort, and

4) providing for correlation with other clinical courses.(19)

It is suggested that in a three year nursing program the course in pharmacology for nursing students be three years in length. Using the term "integrating", part of the teaching would be accomplished by combining pharmacology with the clinical nursing subject matter content to make it more interesting. This might well make it necessary for all supervisors and instructors concerned to plan the course together.

It is interesting to note how, from different sources, widely

divergent suggestions are proposed for the accomplishment of the same purpose. In one description of curriculum planning in a new school of nursing, with regard to clinical content, it was concluded that "pharmacology would be included as drugs were encountered".(18)

An article by Beane, appearing in the American Journal of Nursing fifteen years ago, suggested as a method of correlating theory and practice, monthly case reports including specific information about each medication given by first year students.(4)

Pharmacology has been described as being "dull, uninspired, monotonous". This can undoubtedly be so when the student is required to memorize an agenda of so-called classic drugs which she seldom, if ever, has opportunity to administer. The unidentified author of this article maintained that pharmacology is most interesting to the student nurse because of the patient who is receiving drugs and the reason for which they are being given.(6)

For the student to be able to administer the medications about which she has studied is a motivation to greater learning. It may be advisable, therefore, to defer the teaching of less common medications to a later date. Many can be conveniently taught in conjunction with other courses; such as anesthetics with operating room nursing.(14)

Elder observes that pharmacology has undergone considerable revision in recent years, and keeping up to date is quite a problem. Because nurses must know more about the numerous drugs they are called upon to administer, there is a need for continuing study and expanding knowledge.(10)

The situation is epitomized in this pithy little verse by Frances Gibson.

> How simple were our problems once
> When drugs had one name and no more,
> How simple were our problems when
> The vitamins were only four.
>
> Medicines were once so few
> They were no problem to disperse,
> But now each day new ones appear,
> And every day the problem's worse.(15)

So far, most of the methods described as helping nurses become more familiar with new drugs have followed no specific educational plan with regard to what should be taught, how it should be taught, and who should teach it. However, it is agreed that stimulation to learn is an important factor.(10)

It seems evident that pharmacology can no longer be taught in the classroom alone. New drugs present a persistent educational problem which can be solved only in the clinical situation. Because of the apalling number of new drugs and the possibility of the student being required to administer them without yet having had the opportunity to learn about them in the classroom, a ward library which provides a quick and reliable source of information about drugs is almost essential. Among the recommended volumes are:

1) some recent textbooks of pharmacology,
2) New and Non-Official Remedies,
3) Modern Drug Encyclopedia
4) texts in medical and surgical nursing,
5) the Physicians Desk Reference, and

6) current drug company literature.(28)

The use of trade names is a built-in source of confusion. It has been reported that about 90% of all prescriptions written today are for medications already prepared by a manufacturer. It is particularly confusing to the nurse when equivalent products from several manufacturers are stocked. The problem of brand-name substitution can be a deliberative one.(29)

Some authors of pharmacology texts restrict the drugs included in their content to those which are U.S.P. accepted. Others maintain that efforts should be directed toward helping the nurse become more familiar with the more current preparations, inasmuch as they are used and prescribed daily.(30)

Medication errors continue to occur with alarming frequency. Any effort to reduce these errors should be given thoughtful consideration. Among the factors predisposing to errors are:

1) incorrect or inadequate labelling of medications;

2) poor arrangement of medications in closets;

3) illegible medicine tickets; and

4) the human factors of hurry, tension, carelessness, lack of skill, and fear of making mistakes.(24)

Three fundamental concepts have been proposed which may help the teacher of pharmacology for nursing students as she prepares and presents the material. They are:

1) one is never through studying pharmacology,

2) the farther pharmacology gets from the bedside the less interesting it becomes, and

3) it is more important to know where to find information than to remember isolated facts.(6)

Teaching is more vital and lasting when it is connected in the student's mind with actual patient care.(24) As part of the basis for planning a course in pharmacology for nursing students, a thorough look at what medications are being administered to the type of patients for whom the students will be caring in the actual situation will be of significant help.

CHAPTER III

CONDUCT OF THE STUDY

Purpose

The purpose of this study was to attempt to identify those medications which are of greatest importance to the student nurse on the basis of their frequency of ordering and administration. It was hoped that this information could be utilised to promote better selection of content for pharmacology, increased correlation between the teaching of pharmacology and medical and surgical nursing, as well as provide implications for paralleling of content in pharmacology classes with students' clinical experience in medical and surgical nursing.

Description of Procedure for Collection of Data

The hospital selected for this study has a bed complement of 446 (excluding bassinets). There are 85 beds in the maternity hospital. The remaining 361 bed complement is in the "general hospital" and hereafter will be referred to as such. The hospital is fully approved by the Joint Commission on Accreditation of Hospitals and is a member of the American Hospital Association.

The daily average patient census in the general hospital is 274.66. The average day stay per patient is 7.62. This hospital provides services primarily for patients with acute illnesses.

The surgical department has a bed capacity of 108 and has an average daily census of 105.39. The medical department has a bed capacity of 106 and an average daily census of 81.10.(11)

The hospital conducts a diploma school of nursing and provides most of the clinical facilities for an affiliated degree school of nursing. The combined enrollment as of January 1, 1958, was 213.(12)

Administrative clearance to conduct the study was secured through the Director of Nursing (Appendix B).

The survey was limited to the medical and surgical departments of the aforementioned general hospital because:

1) they include the largest number of patients;
2) they represent the largest and most comprehensive segments on the basis of variety of diagnosis and age of patients, (orthopedics and pediatrics are the only two specialty areas);
3) the student nurses most commonly begin their clinical practice in these services; and
4) instruction in pharmacology co-exists with the students' assignment to these areas.

In devising the design for study it was necessary to decide on the primary sources of data, draw up a form for recording data, and determine a schedule for collecting data. Two trial runs were done to investigate the possibilities.

The Kardexes and nurses' notes on the charts of the active patient census were selected as the primary sources of data.

A column-type form was utilized for enumerating these data. It included the name of the drug, dosage, ordered time of administration, specific indications or instructions for administration, and actual times of administration. (Appendix C).

A schedule which would permit purposive sampling was devised. The data were collected seven consecutive times at eight-day intervals. This extended the sampling over an eight weeks period, thus permitting a reasonable turnover of patients, as well as a sampling from each day of the week. The latter factor might influence the data collected because of the diversity of hospital activities on the different days of the week.

It is recognized that there may well be seasonal factors involved in the use of some drugs. However, it would seem wiser to cope with those changes by briefly repeating the survey process at some other time rather than to prolong the study. An extension of time would tend to make the data unduly cumbersome. Furthermore, the rapid advent of numerous new medications might preclude the value of short-term surveys more frequently instead of long-term surveys at protracted intervals.

It seemed advantageous to collect the data after 11 p.m. The preceding 24-hour period for which the data were collected would then correspond approximately to the calendar day. It would also be possible to include the entire daily census in the selected areas, newly-admitted as well as discharged and deceased patients. Furthermore, and of considerable importance, the Kardexes and charts

would be more accessible to the collector inasmuch as there were a fewer number of nurses on night duty who needed to use these Kardexes and charts.

Description of Analysis of the Data

Essentially, the data were classified according to the systems affected by the drugs. As a guide, the index of Krug & McGuigan's Pharmacology in Nursing[23] was used. This was the text used by the students.

The major categories were:

1) Antiseptics and disinfectants,
2) Antibiotics,
3) Drugs that affect the central nervous system,
4) Autonomic drugs,
5) Skeletal muscle relaxants,
6) Drugs that affect the digestive system,
7) Drugs that affect the circulatory system,
8) Drugs that affect the respiratory system,
9) Drugs that affect the skin and mucous membranes,
10) Drugs that affect the urinary system,
11) Drugs that affect the eye,
12) Drugs that affect the reproductive system,
13) Chemotherapeutic agents, and
14) Drugs used in disorders of metabolism and nutrition.

The drugs were then further grouped according to their pharmacological effect. The Physicians' Desk Reference to Pharmaceutical Specialties and Biologicals, Thirteenth Edition,[27] was invaluable at this point because of the large number of new drugs and trade names. The Modern Drug Encyclopedia and Therapeutic Index, 6th Edition,[20] was also used.

In many instances the placing of drug preparations in the selected categories was quite deliberative and somewhat arbitrary because of their multiple effects and uses, and the variety of forms in which they are prepared.

In the process of categorizing it was decided to have three additional classifications for:

15) Serums and vaccines;

16) Rx Medications - most of which were identified grossly, e.g., as 'hormones', 'vitamins', 'pain', etc.; and

17) Unidentified drugs - which after reasonable seeking could not be found in the literature.

The number of times that drugs in these seventeen categories were ordered and the number of times administered in the medical and the surgical departments were tabulated and totaled.

Findings of the Study

In all but one instance, drugs that affect the digestive system, the number of times of administration exceeded the number of times ordered. These drug classifications were therefore placed in rank

order according to the number of times of administration.

A vast numerical difference is evidenced which should indicate to some degree the relative importance of these drug classifications to the nursing student in the care of her patient.

TABLE I

FREQUENCY OF ADMINISTRATION OF MEDICATIONS ACCORDING TO SELECTED DRUG CATEGORIES

Drug Classification	Times Administered
Drugs that affect the central nervous system	3290
Antibiotics	840
Drugs that affect the digestive system	832
Drugs that affect the circulatory system	632
Drugs used in disorders of metabolism and nutrition	485
Drugs that affect the autonomic system	417
Chemotherapeutics	322
Drugs that affect the respiratory system	234
Drugs that affect the skin and mucous membranes	192
Drugs that affect the urinary system	183
Skeletal muscle relaxants	70
Antiseptics and disinfectants	55
Rx medications	50
Drugs that affect the reproductive system	34
Drugs that affect the eye	28
Serums and vaccines	4
Unidentified preparations	3
TOTAL	7671

Each category was then considered in the rank order in which it appeared in the preceding table. The individual drugs or drug

groupings within these major categories were again placed in rank order within each succeeding table except where a more logical order was indicated.

Drugs affecting the central nervous system were of greatest numerical incidence and far exceeded any other group. The drugs were further categorized into standard groupings according to their pharmacological effects. Again there was a wide range between the most frequently administered and the least frequently administered of these groups.

TABLE II

FREQUENCY OF ORDERING AND ADMINISTRATION OF DRUGS THAT AFFECT THE CENTRAL NERVOUS SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Analgesics	851	417	1268	965	369	1334
Sedatives and Hypnotics	588	511	1099	526	510	1036
Tranquilizers	223	186	409	179	334	513
Analgesic/ antipyretics	99	147	246	84	180	264
Anticonvulsants	17	20	37	46	48	94
Psychic energizers	19	14	33	28	18	46
C.N.S. stimulants	3	0	3	3	0	3
TOTAL	1800	1295	3095	1831	1459	3290

Antibiotics and drugs that affect the digestive system were almost identical in regard to the total number of times administered.

There was a wide range in the numerical usage of the various antibiotics. Trade names began to present themselves as a potential source of confusion.

TABLE III

FREQUENCY OF ORDERING AND ADMINISTRATION OF ANTIBIOTICS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Chloromycetin	49	46	95	137	134	271
Penicillin with streptomycin and/or dihydrostreptomycin combinations	78	39	117	129	67	196
Penicillin	21	52	73	31	94	125
Tetracycline	10	16	26	31	41	72
Erythromycin	4	16	20	17	45	62
Streptomycin and/or dihydrostreptomycin	9	1	10	15	2	17
Aureomycin	0	3	3	0	5	5
Oxytetracycline	1	1	2	2	4	6
Kantrex	1	0	1	2	0	2
Neomycin	1	0	1	1	0	1
Antibiotic and cortisone combinations	4	16	20	17	39	56
Antibiotic combinations	6	9	15	9	13	22
Antibiotic and sulfa combinations	1	1	2	3	2	5
TOTAL	185	200	385	394	446	840

Drugs that affect the digestive system were ordered primarily under specific trade names. Once the product was identified it was not difficult in most instances to classify it further according to its main use. This was not true of some of the antiemetics, however, which had other almost equally important effects. Dramamine, marezine, and thorazine were identified as antiemetics primarily.

TABLE IV

FREQUENCY OF ORDERING AND ADMINISTRATION OF DRUGS THAT AFFECT THE DIGESTIVE TRACT

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Cathartics	256	345	601	232	225	457
Bulk forming	(156)	(245)	(401)	(129)	(123)	(252)
(Fecal softeners)	(80)	(69)	(149)	(91)	(87)	(178)
(Anthroquinone comp.)	(20)	(30)	(50)	(12)	(12)	(24)
(Others)		(1)	(1)		(3)	(3)
Antacids	28	52+	80+	69	95	164+*
Antiemetics	230	108	338	66	96	162
Digestants	2	7	9	5	18	23
Suppositories	10	13	23	10	3	13
Antidiarrheics	4	6	10	1	7	8
Diagnostic agents	2	2	4	3	2	5
TOTAL	532	533	1065	386	446	832

* Reliability of numbers is questionable, probably less than actual, because antacid preparations were ordered to be left at bedside to be taken at patients' discretion.

Drugs affecting the circulatory system included a variety of therapeutic agents. They were grouped as those which affected the heart, blood vessels, blood pressure, and blood components.

Digitalis was obviously the greatest single drug to be included under drugs that affect the circulatory system. Because of the several alkaloids as well as the several trade names there were a dozen different names by which digitalis preparations were ordered.

TABLE V

FREQUENCY OF ORDERING AND ADMINISTRATION OF DRUGS THAT AFFECT THE CIRCULATORY SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Drugs affecting the heart:	24	114	138	33	175	208
Digitalis comp.	(21)	(94)	(115)	(27)	(98)	(125)
Quinidine	(3)	(20)	(23)	(6)	(77)	(83)
Drugs affecting the blood:	51	76	127	97	107	204
Hematinics	(26)	(21)	(47)	(51)	(37)	(88)
Antifibrinolytic agents	(11)	(14)	(25)	(24)	(24)	(48)
Anticoagulants	(2)	(32)	(34)	(2)	(29)	(31)
Vitamin K comp.	(10)	(5)	(15)	(18)	(7)	(25)
Coagulants	(2)	(4)	(6)	(2)	(10)	(12)
Drugs affecting the blood vessels:	23	121	144	20	159+	179+*
Vasodilators	(6)	(82)	(88)	(4)	(111)+	(115)+*
Antihistamines	(17)	(32)	(49)	(16)	(43)	(59)
Vasoconstrictors	(0)	(6)	(6)	(0)	(4)	(4)
Gynergen	(0)	(1)	(1)	(0)	(1)	(1)
Antihypertensives	2	13	15	8	23	31
Drugs that decrease capillary fragility: Rutorbin	5	0	5	10	0	10
TOTAL	105	324	429	168	464	632 *

* Reliability of numbers is questionable, probably less than actual, because nitroglycerine was ordered left at bedside to be used at patients' discretion.

Drugs used in disorders of metabolism and nutrition divided logically into those of endocrine origin or inhibiting endocrine function, and those constituting dietary supplements. Two separate tables were prepared. Endocrine preparations were considered first.

The advent of the corticosteroids and adrenocorticotropins increased appreciably the incidence of use of endocrine compounds and their use in a diversity of diagnoses. The group considered here excluded ovarian, androgen, and posterior pituitary preparations which were included under drugs that affect the reproductive system.

TABLE VI

FREQUENCY OF ORDERING AND ADMINISTRATION OF DRUGS OF ENDOCRINE ORIGIN (excluding those affecting the reproductive system)

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Corticosteroids	2	34	36	6	73	79
Antithyroid compounds		11	11		24	24
Insulin	7	15	22	6	14	20
Adrenocorticotropins	3	15	18	3	16	19
Orinase	2	5	7	4	9	13
Thyroid preparations	5	9	14	3	9	12
Lugol's solution	1	3	4	2	3	5
TOTAL	20	93	112	24	148	172

Drugs used in the treatment of nutritional disorders were mostly vitamin preparations. Once again, the majority of these were ordered under trade names. They were identified according to their composition and indicated thusly in the accompanying table. Vitamin K was excluded from this group and included instead under drugs that affect the circulatory system (affecting blood coagulation).

TABLE VII

FREQUENCY OF DRUGS ORDERED AND ADMINISTERED AS DIETARY SUPPLEMENTS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Vitamin A		2	2		1	1
Vitamin B	3	29	32	6	47	53
Vitamin C	1	7	8	17	14	31
Vitamin B & C	9	15	24	13	20	33
Vitamin E	9		9	21		21
Multivitamin preparations	39	38	77	64	70	134
Vitamin & Mineral preparations	12	20	32	15	18	33
Calcium	2	1	3	3	1	4
Sustagen		1	1		2	2
Arcofac		1	1		1	1
TOTAL	75	114	189	139	174	313

Drugs affecting the autonomic nervous system were seemingly unrelated in any way other than the mechanism through which they produced their effect. Most of the sympathomimetics were related in use to drugs affecting the respiratory system. The synthetic anticholinergic compounds were used primarily in the treatment of diseases of the digestive tract. The atropine and belladonna group predominated.

TABLE VIII

FREQUENCY OF ORDERING AND ADMINISTRATION OF DRUGS AFFECTING THE AUTONOMIC NERVOUS SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Sympathomimetics	7	23	31	19+	17+	36+*
Parasympathomimetics						
Acting on intestines	31		31	25		25
Acting on bladder	3		3	5		5
Anticholinergics						
Belladonna preparations	22	34	56	56	90	146
Banthine and Probanthine	6	16	22	16	41	57
Scopolamine	78	2	80	49	2	51
Atropine	51	8	59	39	1	40
Pamine (without & with Phenobarbital)	2	2	4	6	8	14
Trasentine	1	1	2	3	3	6
Artane	1	1	2	1	3	4
Tral		2	2		4	4
Pathilon		1	1		3	3
Tincture of hyoscyamus		1	1		3	3
Above in combination with tranquilisers	4	5	9	7	16	23
TOTAL	207	96	302	226	191+	417+*

* Reliability of numbers is questionable, probably less than actual, because neo synephrine was ordered left at bedside to be used at patients' discretion.

The chemotherapeutic agents were almost exclusively sulfonamides. The only other numerically significant compounds were the nitrofurans.

TABLE IX

FREQUENCY OF ORDERING AND ADMINISTRATION OF CHEMOTHERAPEUTICS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Sulfa compounds	88	21	109	234	55	289
Nitrofuran compounds	6	5	11	16	11	27
Antimalarials		2	2		3	3
Tuberculostatics (other than antibiotics)	1		1	2		2
Kaolin suspension		1	1		1	1
TOTAL	95	29	124	252	70	322

Drugs which affect the respiratory system were essentially reduced to those having a local effect on the respiratory tract. Those acting on the respiratory center had already been classified as drugs acting on the central nervous system.

TABLE X

FREQUENCY OF ORDERING AND ADMINISTRATION OF DRUGS THAT AFFECT THE RESPIRATORY SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Antitussive/ expectorants	7	41	48	13	78	91
Potassium iodide	4	23	27	4	67	71
Mucolytic agents	5	14	19	20	16	36
Antispasmodics	3	10	13	7	20	27
Antiseptics	5	6	11	6	3	9
TOTAL	23	97	120	50	183	234

Drugs that affect the skin and mucous membranes were more definable by their method of application than any other single factor. Again many of these preparations had been considered in a broader aspect; e.g., antibiotics, antiseptics.

TABLE XI

FREQUENCY OF ORDERING AND ADMINISTRATION OF DRUGS THAT AFFECT THE SKIN AND MUCOUS MEMBRANES

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Antiseptics and Parasiticides	13	37	50	20	67	87
Drugs which soothe	11	30	41	4	51	55
Stimulants and Irritants		12	12		20	20
Antipruritics		8	8		11	11
Anesthetic preparations	7	17	24	1	6	7
Astringents	1	6	7		5	5
Protectives	3		3	4		4
Counterirritants		2	2		2	2
Keratolytics		1	1		1	1
TOTAL	35	113	148	29	163	192

To consider only drugs that affect the urinary system restricted this classification also. Diuretics constitute the main group. Urinary antiseptics and urinary analgesics included those which were exclusive in their effect on the urinary system.

TABLE XII

FREQUENCY OF ORDERING AND ADMINISTRATION OF DRUGS THAT AFFECT THE URINARY SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Diuretics	14	59	73	25	90	115
Diamox and Diuril	(9)	(48)	(57)	(14)	(74)	(88)
Saline diuretics	(4)	(6)	(10)	(10)	(10)	(20)
Mercurial diuretics	(1)	(5)	(6)	(1)	(6)	(7)
Urinary analgesics	21	3	24	40	11	51
Benemid (a renal blocking agent)		4	4		16	16
Urinary antiseptics	1		1	1		1
TOTAL	36	66	102	66	117	183

Skeletal muscle relaxants *per se* were a very small group. Again there were other drugs which also produced this effect, but it was felt that they belonged in a broader classification. There were six different drugs under six different trade names. They are listed individually in the Master Tabulation (Appendix D).

TABLE XIII

FREQUENCY OF ORDERING AND ADMINISTRATION OF SKELETAL MUSCLE RELAXANTS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Curare-like compounds	1		1	1		1
Mephenesin compounds	2	8	10	5	22	27
Other synthetics (4)		16	16		42	42
TOTAL	3	24	27	6	64	70

Antiseptics and disinfectants constituted a motley variation. There was much overlapping between this group and drugs which affect the skin and mucous membranes.

TABLE XIV

FREQUENCY OF ORDERING AND ADMINISTRATION OF ANTISEPTICS AND DISINFECTANTS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Oxidising agents	13	3	16	17	4	21
Detergents	2	15	17	2	11	13
Dyes	3	2	5	7	2	9
Silver compounds ($AgNO_3$)	9	1	10	6	1	7
Iodine compounds	1		1	3		3
Chlorine compounds (Azochloramide)		2	2		2	2
TOTAL	28	23	51	35	20	55

There were several orders for Rx medications which were not classified beyond this point. In one instance the content was specifically identified. In two others, the content was identified generally; i.e., Rx vitamin, Rx hormone. In two others, the identification related only to the purpose; i.e., Rx pain, Rx cough. The remainder were without identification.

TABLE XV

FREQUENCY OF ORDERING AND ADMINISTRATION OF DRUGS LABELLED AS Rx MEDICATIONS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Rx without any identification	2	18	20	2	36	38
Rx vitamin		2	2		6	6
Rx phenobarbital and atropine		3	3		3	3
Rx hormone		2	2		1	1
Rx pain		1	1		1	1
Rx cough	1		1	1		1
TOTAL	3	26	29	3	47	50

Drugs affecting the reproductive system were drugs of endocrine origin and might well have been combined with that group.

TABLE XVI

FREQUENCY OF ORDERING AND ADMINISTRATION OF DRUGS WHICH AFFECT THE REPRODUCTIVE SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Estrogens	15	13	28	13	12	25
Androgens	4	6	10	2	5	7
Progesterone		1	1		1	1
Posterior pituitary preparations (Pitocin)	1		1	1		1
TOTAL	20	20	40	16	18	34

Drugs that affect the eye were few, non-specific, miscellaneous, and readily included in other groupings; e.g., ophthalmic antibiotic and cortisone preparations.

Serums and vaccines were apparently rarely administered to hospitalized patients on these services at the time of the study.

TABLE XVII

FREQUENCY OF ORDERING AND ADMINISTRATION OF SERUMS AND VACCINES

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Tetanus toxoid	1	1	2	1	1	2
Gamma globulin	1		1	1		1
Mantoux test		1	1		1	1
TOTAL	2	2	4	2	2	4

Four medications remained unidentified. Only three of these were administered.

Interpretation of Findings

As a descriptive survey infers, the findings of this study indicate the current conditions within these medical and surgical areas relevant to the ordering and administration of medications. They may or may not be in accord with all or any of the general impressions of the individuals concerned with the various facets of operation within the areas.

It seems evident that the number and variety of medications provides ample opportunity for a broad clinical experience for student nurses in the administration of medications. There were over 7,500 administrations in the seven days during which the data were collected.

The frequency of administration of drug classifications, as shown in Table One, is considered to be a quantitative measure of their importance to those who must administer them. It is important from the aspect of their placement in the course in pharmacology inasmuch as the nursing student will have relatively immediate and repeated use for knowledge of these medications. It is also important with regard to the allocation of amount of time for teaching this particular subject matter content.

A study of each of the succeeding tables relates comparable information about the drug groupings within these categories.

A further study of these tables serves as an aid in centering attention on the important aspects of pharmacology in either the medical or surgical department, or both. They may serve as indicators

of general conditions in these areas for providing clinical practice for nursing students.

The comparability of drug usage in the medical and surgical areas is worthy of note.

It is interesting to observe in each table the relationship between the number of times drugs were ordered and the number of times administered. However, that any overall significance exists in this relationship is doubtful.

To re-emphasize an issue, the practical problem of trade names is paramount. It has been stated that about 90% of all prescriptions written today are for medications already prepared by a manufacturer.(29) Though no statistical analysis was attempted with these data, it seems apparent that the findings point strongly in this direction.

In classifying the data, it appears that there are entire groups of drugs which are of recent enough origin not to appear in even relatively recent nursing texts; i.e., the tranquilizers and psychic energizers. Yet students are administering these drugs in large numbers.

The findings of this study have certain use in evaluating the timeliness of pharmacology textbooks. In the process of the study, it was observed that many of the drugs in use were not to be found in pharmacology for nursing texts. The texts also included many drugs which were not in use, at least not in the particular setting used for this survey.

A gross comparison was done, using the index of Krug and

McQuigan's *Pharmacology for Nursing*[23] as a guide. Slightly less than half of the medications ordered were found to be included by name. However, some of the names of drugs were so obvious that general information about them could be found in almost any text; e.g., "multivitamin preparations".

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The primary purpose of this study was to ascertain those medications which were ordered and administered in the medical and surgical departments of a selected general hospital operating a diploma school of nursing. Inasmuch as the students are required to have knowledge of the drugs they administer, the results of such a survey can be considered essential information relative to drug therapy as a part of patient care in the selected situation. Possible implications for the planning of the course in pharmacology for nursing students might then be drawn from the organized data.

The survey method was used to obtain the necessary data. The primary sources of data were the Kardexes and nurses' notes on the charts of the patients confined to these medical and surgical areas. A schedule for the collection of data was devised which permitted a purposive sampling to include each day of the week and to extend over a suitable length of time.

The data were tabulated according to selected categories, and tables were constructed for an analysis of these data. Relationships existing between the major categories are indicated, as well as relationships between the usage of drugs on the medical and surgical departments.

The study was limited to a numerical evaluation of the importance of these drugs insofar as they were related to the nursing students' activities in the designated medical and surgical clinical areas.

The variety of drugs in use was found to be very extensive. New drugs could not always be found in standard textbooks. The use of trade names constituted a large problem in their identification. Preparations of two or more drugs compounded the difficulties of categorizing.

The diversity in degree of use of certain drugs, drug groupings and categories was obvious. For example, the number of times of administration of drugs that affect the central nervous system was more than four times that of any other single category.

Conclusions

On the basis of the information secured through this survey, the conclusions which have been reached are that:

1. the student nurses' need for knowledge about a wide variety of drugs is even greater than might have been anticipated;
2. in view of the many administrations of medications, it is not surprising that errors do occur;
3. there is a considerable difference in the frequency of administration of drugs and drug categories, which should have a bearing upon the selection of content and sequence of presentation in pharmacology for nursing students;

4. there is a need for some up-to-date and rapid authoritative reference about drugs to be readily available on all clinical areas where there are nursing students;
5. inasmuch as nurses are the ones who administer most medications, the printed materials which accompany many newer drugs should be geared to nurses' use;
6. there is a need for intermittent surveys of some nature in order to keep the course content of pharmacology for nursing students current; and
7. the selection of a textbook for pharmacology should be influenced by the timeliness of its content and the current drug therapy practices in the area.

Recommendations

The recommendations for further study which have developed through this survey are that:

1. a similar survey should be made at some later date for purposes of comparison and identification of change;
2. a comparative study be made of the course outline for teaching pharmacology to the nursing students and the results of a survey of the medications which they administer;
3. the pharmacological content in the courses in medical and surgical nursing be identified and compared with the results of the study;

4. similar surveys be done in the other areas of the hospital, maternity, pediatrics, and orthopedics, in order to identify comparable information in these areas;
5. an item analysis of the textbooks in pharmacology be made to see if they meet the needs of student nurses; and
6. the opinions of student nurses be sought concerning their impressions of the effectiveness of their preparation in pharmacology.

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APPENDIX A

LETTER TO THE DIRECTOR REQUESTING PERMISSION TO CONDUCT THE STUDY

2623 S. E. Ankeny Street
Portland, Oregon
May 13, 1958

Miss Esther Jacobson, R.N.
Director of Nurses
Emanuel Hospital
Portland, Oregon

Dear Miss Jacobson:

I have finally isolated my thesis topic! It is impressively entitled "Improving the Instruction in Pharmacology by Means of a Survey of the Medications Ordered and Administered in the Medical and Surgical Departments of a Selected General Hospital."

The next step - according to protocol - is to secure permission to carry out said survey in said "selected general hospital." Because I am familiar with the procedures, personnel, and teaching at Emanuel, I would like very much to do the research there. Would this be possible and permissible?

The activity will involve only myself, so I do not think it will cause the institution any major inconvenience. The data gathered would have no significant identification other than the general source.

So that I may make more positive plans, I would appreciate hearing from you with regard to this at your earliest convenience.

Sincerely,

Moira Mansell

APPENDIX B

LETTER FROM THE DIRECTOR GRANTING PERMISSION TO CONDUCT THE STUDY

EMANUEL HOSPITAL
2801 north gantenbein avenue • portland 12, oregon
E H

May 16, 1958

Miss Moira Mansell, R.N.
2623 S. E. Ankeny Street
Portland, Oregon

Dear Miss Mansell,

We shall be happy to have you use Emanuel Hospital as your research laboratory for your thesis. Your topic is both impressive and challenging and your conclusions will be of interest to us too, I am sure.

If there is any way in which we can be of assistance to you in this project, please let us know.

Very sincerely,

Esther A. Jacobson, R.N.
Director of Nursing

EAJ/lf

APPENDIX C

FORM FOR THE COLLECTION OF DATA

Drug	Dosage	Ordered time of Administration	Indications for Administration (if any)	Times Administered 11-7 : 7-3 : 3-11

APPENDIX D

MASTER TABULATION SHEETS *

DRUGS THAT AFFECT THE CENTRAL NERVOUS SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Analgesics:						
Demerol	243	118	361	307	160	467
Morphine	223	73	296	226	28	254
Empirin Compound with Codeine	153	91	244	143	81	224
Codeine	107	35	142	107	29	136
Dilaudid	24	5	29	69	1	70
Pantapon	30	1	31	52	0	52
Darvon compound	18	30	48	23	17	40
Darvon	5	21	26	2	20	22
Percodan	28	16	44	10	8	18
Paregoric	3	16	19	2	12	14
Papaverine	2	1	3	6	3	9
Leritene	7	4	11	2	7	9
Nisentil	1	0	1	5	0	5
Tincture of opium	1	2	3	4	0	4
Deodorised tincture of opium	0	3	3	0	3	3

* Sequence of drugs in master tabulation consistent with sequence of tables in Chapter III.

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Codempiral	3	0	3	3	0	3
Percobarb	2	0	2	2	0	2
Levo dromoran	1	0	1	2	0	2
Zactirin	0	1	1	0	0	0
TOTAL	851	417	1268	965	369	1334
Sedatives and Hypnotics:						
Seconal	244	124	368	211	77	288
Phenobarbital	62	97	159	74	185	259
*(Eskabarb)	(5)	(8)	(13)	(3)	(8)	(11)
Nembutal	187	91	278	160	66	226
Doriden	21	71	92	19	62	81
Tuinal	29	56	85	21	50	71
Amytal	33	7	40	33	9	42
Chloral hydrate	5	38	43	4	36	40
Valmid	1	16	17	1	17	18
Carbrital	3	5	8	2	5	7
Placidyl	2	3	5	1	1	2
Butisol sodium	1	2	3	0	2	2
Paraldehyde	0	1	1	0	0	0
TOTAL	588	511	1099	526	510	1036

* A sustained release capsule containing phenobarbital.

Drug	Number of times ordered on Surgical Ward	Number of times ordered on Medical Ward	Number of times ordered Total	Number of times administered on Surgical Ward	Number of times administered on Medical Ward	Number of times administered Total
Tranquilizers:						
Sparine	21	70	91	39	106	145
Meprobamate	12	37	49	25	98	123
*(Equanil)	(10)	(31)	(41)	(22)	(88)	(110)
*(Miltown)	(2)	(6)	(8)	(3)	(10)	(13)
Phenergan	143	27	170	66	47	113
Compazine	35	31	66	28	29	57
Ultran	6	4	10	14	12	26
Pacatal	1	4	5	3	11	14
Vesprin	2	7	9	0	12	12
Atarax	0	2	2	0	7	7
Trilafon	1	1	2	2	4	6
Frenquil	0	1	1	0	4	4
Dartal	0	1	1	0	3	3
Meprospan	0	1	1	0	1	1
Hypnol	1	0	1	1	0	1
Suvren	1	0	1	1	0	1
TOTAL	223	186	409	179	334	513

* Alternate brand names by which meprobamate was ordered.

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Analgesic-Antipyretics:						
Aspirin	79	95	174	71	103	174
Empirin	17	23	40	9	23	32
Bufferin	2	13	15	3	16	19
Sodium salicylates	0	4	4	0	16	16
Butazoldine	0	4	4	0	13	13
Anacin	0	3	3	0	6	6
Methyl salicylate	0	3	3	0	2	2
Colchicine	0	1	1	0	1	1
Coricidin	1	0	1	1	0	1
Phenophen	0	1	1	0	0	0
TOTAL	99	147	246	84	180	264
Anticonvulsants:						
Dilantin	15	20	35	41	48	89
Mebaral	2	0	2	5	0	5
TOTAL	17	20	37	46	48	94
Psychic energizers:						
Marsilid	7	6	13	9	11	20
Dextro-amphetamine	8	4	12	13	4	17
Dexamyl	4	0	4	6	0	6
Wyamine sulfate	0	2	2	0	2	2
Deaner	0	2	2	0	1	1
TOTAL	19	14	33	28	18	46

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Central nervous system stimulants:						
Caffeine & sodium benzoate	2	0	2	2	0	2
Coramine	1	0	1	1	0	1
TOTAL	3	0	3	3	0	3

ANTIBIOTICS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Chloromycetin	49	46	95	137	134	271
Penicillin with streptomycin and/or dihydrostreptomycin:						
Dicrysticin	58	30	88	95	54	149
Combiotic	20	9	29	34	13	47
TOTAL	78	39	117	129	67	196
Penicillin	21	52	73	31	94	125
Tetracyclines:						
Achromycin	4	9	13	15	29	44
Tetrex	3	1	4	10	4	14
Cosa-tetracycline	0	1	1	0	4	4
Cosa-tetracin	2	0	2	3	0	3
Sumycin	1	0	1	3	0	3
Tetracycline	0	4	4	0	3	3
Tetracyn	0	1	1	0	1	1
TOTAL	10	16	26	31	41	72
Erythromycin	4	16	20	17	45	62
Streptomycin and/or dihydrostreptomycin:						
Distryein	3	1	4	5	2	7
Dihydrostreptomycin	3	0	3	5	0	5
Streptomycin	3	0	3	5	0	5
TOTAL	9	1	10	15	2	17

Drug	Number of times ordered on Surgical Ward	Number of times ordered on Medical Ward	Number of times ordered Total	Number of times administered on Surgical Ward	Number of times administered on Medical Ward	Number of times administered Total
Oxytetracycline:						
Terramycin ointment	0	1	1	0	4	4
Terramycin	1	0	1	2	0	2
TOTAL	1	1	2	2	4	6
Aureomycin:						
Aureomycin ointment	0	2	2	0	3	3
Aureomycin & nupercaine ointment	0	1	1	0	2	2
TOTAL	0	3	3	0	5	5
Kantrex	1	0	1	2	0	2
Neomycin	1	0	1	1	0	1
Antibiotic & cortisone combinations:						
Neocortef eye-ear	3	9	12	11	22	33
Hydrosets	1	1	2	6	1	7
Cortisporin	0	2	2	0	6	6
Neodelta cortef	0	2	2	-	6	6
Neomagma-cort.	0	1	1	0	2	2
Terracortil	0	1	1	0	2	2
TOTAL	4	16	20	17	39	56
Antibiotic combinations:						
Mysteclin	1	4	5	1	7	8
Achrostatin	1	1	2	4	2	6
Cos-otic P.M.	0	1	1	0	4	4
Cosatetrastatin	1	0	1	3	0	3

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Spectrocin	2	1	3	1	0	1
Neosporin-bacitracin compound	0	1	1	0	0	0
Tetrazets	1	0	1	0	0	0
Tyrozets	0	1	1	0	0	0
TOTAL	6	9	15	9	13	22
Antibiotic & sulfa combinations:						
Cremamycin	1	0	1	3	0	3
Pentid-sulfa	0	1	1	0	2	2
TOTAL	1	1	2	3	2	5

DRUGS THAT AFFECT THE DIGESTIVE TRACT

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Cathartics:						
Bulk forming:						
Milk of Magnesia	32	158	190	18	62	80
Mineral oil	42	8	50	37	4	41
Petrogalar	20	27	47	19	17	36
Haleys M-O	12	29	41	11	20	31
Metamucil	18	2	20	25	1	26
L-A Formula	3	7	10	2	12	14
Agarol	25	9	34	12	1	13
Konsyl	1	2	3	1	4	5
Senekot	1	0	1	3	0	3
Fleets phospho soda	1	3	4	0	2	2
Sal hepatica	1	0	1	1	0	1
Fecal softeners:						
Doxinate	42	16	58	46	33	79
Doxinate with danthron	14	22	36	9	22	31
Kosate	7	5	12	19	12	31
Doxan	8	24	32	5	19	24
Colase and Pericolase	9	2	11	12	1	13
Anthraquinone compounds:						
Dorbane	16	18	34	9	7	16

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Cascara	3	12	15	2	5	7
Modane	1	0	1	1	0	1
Others:						
Serutan	0	1	1	0	3	3
TOTAL	256	345	601	232	225	457
Anti-emetics:						
Dramamine	206	80	286	59	38	97
Thorazine	6	17	23	3	55	58
Marezine	17	11	28	3	3	6
Bonadoxin	1	0	1	1	0	1
TOTAL	230	108	338	66	96	162
Antacids:						
Gelusil	5	12	17	14	39	53
Titralac	3	2	5	9	17	26
Amphojel	10	21+	31+	12	3+	15+
Neosorb	1	0	1	15	0	15
Phosphojel	1	2	3	5	10	15
Alkazane	0	1	1	0	11	11
Bisodol	4	6	10	4	3	7
Sippy	1	0	1	7	0	7
Aludrox	0	1	1	0	4	4
Maalox	0	1	1	0	4	4
Alkets	0	0	0	0	3	3
Magnesium oxide	1	-	1	3	0	3

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Amaced	0	3	3	0	1	1
A.M.T.	1	0	1	0	0	0
Fibrin	1	0	1	0	0	0
Soda mint	0	3	3	0	0	0
TOTAL	28	52	80	69	95	164
Digestants:						
Acidulin	0	3	3	0	7	7
Dilute hydrochloric acid	0	2	2	0	6	6
Decholin	2	2	4	5	5	10
TOTAL	2	7	9	5	18	23
Suppositories:						
Glycerine	9	12	21	10	2	12
Pharmalax	0	1	1	0	1	1
Dal colart	1	0	1	0	0	0
TOTAL	10	13	23	10	3	13
Antidiarrheics:						
Kaopectate	2	4	6	0	4	4
Pectocel	0	1	1	0	2	2
Dr. Carter's antidiarrheic mixture	1	1	2	1	1	2
Donnagel with paregoric	1	0	1	0	0	0
TOTAL	4	6	10	1	7	8
Diagnostic agents:						
Telepaque	1	2	3	1	2	3
Diagnex blue	1	0	1	2	0	2
TOTAL	2	2	4	3	2	5

DRUGS THAT AFFECT THE CIRCULATORY SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Drugs affecting the heart:						
Digitalis compounds:						
Crystodigin	6	28	34	10	29	39
Digitalis	2	16	18	5	16	21
D.R. Digitalis	1	21	22	0	17	17
Digitoxin	5	10	15	5	10	15
Purodigin	1	4	5	1	9	10
Digitalis leaf	1	6	7	1	7	8
Cedilanid	5	1	6	5	2	7
Gitaligin	0	3	3	0	3	3
Digifortis	0	2	2	0	2	2
Lanoxin	0	1	1	0	2	2
Gitalin	0	1	1	0	1	1
Digitora	0	1	1	0	0	0
TOTAL	21	94	115	27	98	125
Quinidine	3	20	23	6	77	83
Drugs that affect the blood:						
Hematinics:						
Roncovite	17	5	22	41	12	53
Trinsicon	2	6	8	3	7	10
Ferrous sulfate	0	3	3	0	9	9
Imferon	3	4	7	3	4	7
Pronemia	3	0	3	3	0	3

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Erucyte	0	1	1	0	3	3
Chel iron	0	1	1	0	1	1
Lextron ferrous	0	1	1	0	1	1
Cupron	1	0	1	1	0	1
Congulants:						
Prothrombin	0	1	1	0	4	4
Adrenostat	1	0	1	2	0	2
Koagamin	1	0	1	0	0	0
Vitamin K compounds:						
Vitamin K	6	4	10	12	6	18
Mephyton	0	3	3	0	6	6
Hykinone	3	0	3	4	0	4
Synkavite	1	1	2	2	1	3
Anticoagulants:						
Coumadin	2	21	23	2	20	22
Dicumarol	0	8	8	0	7	7
Concentrated heparin	0	3	3	0	2	2
Antifibrinolytics:						
Buccal Varidase	6	6	12	15	14	29
Wydase	0	7	7	0	9	9
Chymar	4	1	5	7	1	8
Parenzyme	1	0	1	2	0	2
TOTAL	51	76	127	97	107	204

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Drugs affecting the blood vessels:						
Vasodilators:						
Peritrate	0	24	24	0	77	77
Aminophylline	5	25	30	3	17	20
Priscoline	1	2	3	1	9	10
Arlidin	0	2	2	0	6	6
Roniacol	0	1	1	0	1	1
Histamine acid phosphate	0	1	1	0	1	1
Veritrate	0	1	1	0	0	0
Nitroglycerine	0	26	26	0	+	+ *
Vasoconstrictors:						
Adrenalin	0	4	4	0	3	3
Levophed	0	2	2	0	1	1
Antihistamines:						
Benadryl	12	17	29	16	13	29
Pyribenzamine	4	4	8	0	10	10
Chlortrimeton	0	2	2	0	6	6
Teldrin	0	3	3	0	5	5
Copyronil	1	1	2	0	3	3
Dimetane	0	2	2	0	2	2
Perazil	0	2	2	0	2	2

* No numbers available because nitroglycerine was ordered left at bedside to be taken at patients' discretion.

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Sandostine LA	0	1	1	0	2	2
Gynergen	0	1	1	0	1	1
TOTAL	23	121	144	20	159	149
Antihypertensives:						
Reserpine	2	2	4	8	3	11
Serpasil-apresoline	0	2	2	0	8	8
Raudixin	0	1	1	0	4	4
Inversine	0	1	1	0	4	4
Serpasil	0	4	4	0	2	2
Hypersil	0	1	1	0	1	1
Paraserp	0	1	1	0	1	1
Raufaten	0	1	1	0	0	0
TOTAL	2	13	15	8	23	31
Drugs that decrease capillary fragility:						
Rutorbin	5	0	5	10	0	10

DRUGS OF ENDOCRINE ORIGIN

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Cortico-steroids:						
Metacorten	0	9	9	0	19	19
Aristocort	1	4	5	2	14	16
Kenacort	0	7	7	0	15	15
Vasocort solution	0	4	4	0	8	8
Hydrocortisone	1	1	2	4	2	6
Cortone eye gtts.	0	2	2	0	4	4
Prednisone	0	1	1	0	4	4
Medrol	0	2	2	0	3	3
Hydrocortone	0	1	1	0	2	2
Desoxycorticosterone	0	1	1	0	1	1
Cort dome creme	0	1	1	0	1	1
Cortisone	0	1	1	0	0	0
TOTAL	2	34	36	6	73	79
Antithyroid Preparations:						
Tapazol	0	5	5	0	13	13
Thiobarbital	0	6	6	0	11	11
TOTAL	0	11	11	0	24	24
Insulin	7	15	22	6	14	20
Adrenocorticotropins:						
Acthar gel	2	6	8	2	7	9
ACTH	1	7	8	1	6	7
Acthar	0	1	1	0	2	2

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
ACTH gel	0	1	1	0	1	1
TOTAL	3	15	18	3	16	19
Orinase	2	5	7	4	9	13
Thyroid Preparations:						
Thyroid	5	5	10	3	5	8
Cytomel	0	4	4	0	4	4
TOTAL	5	9	14	3	9	12
Lugol's solution	1	3	4	2	3	5

DIETARY SUPPLEMENTS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Vitamin A	0	2	2	0	1	1
Vitamin B:						
Nicotinic acid	1	4	5	4	12	16
B_{12}	2	11	13	2	10	12
Riboflavin	0	2	2	0	6	6
Surbex	0	2	2	0	6	6
B_1	0	3	3	0	4	4
Brewer's yeast	0	2	2	0	4	4
Nicamin	0	2	2	0	2	2
Bejectal	0	1	1	0	1	1
Betalin complex	0	1	1	0	1	1
Betalin S	0	1	1	0	1	1
TOTAL	3	29	32	6	47	53
Vitamin B & C:						
Becotin with C	2	11	13	1	16	17
Surbex with C	4	0	4	9	0	9
Novogran	0	3	3	0	3	3
C & B complex	1	1	2	1	1	2
Folbesyn	2	0	2	2	0	2
TOTAL	9	15	24	13	20	33
Vitamin C:						
Vitamin C	3	4	7	9	7	16
Ascorbic acid	8	3	11	8	7	15
TOTAL	11	7	18	17	14	31

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Multivitamin Preparations:						
Theragran	18	13	31	31	21	52
Multicebrin	8	7	15	14	15	29
Multivitamin	2	5	7	5	11	16
Vidaylin	6	2	8	9	4	13
Vi-stress	0	5	5	0	8	8
Unicap	0	3	3	0	7	7
Theracebrin	3	1	4	3	1	4
Poladex liquid vitamins	0	1	1	0	2	2
Therapeutic formula	1	0	1	1	0	1
Therapeutic vitamin	1	0	1	1	0	1
Zymacap	0	1	1	0	1	1
TOTAL	39	38	77	64	70	134
Vitamin E:						
Epsilon	9	0	9	21	0	21
Vitamin & Mineral preparations:						
Micebrin	4	17	21	5	16	21
Visynerol	3	1	4	3	1	4
Stuart formula	1	1	2	3	0	3
Squibb basic formula	2	0	2	2	0	2

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Hysdoc	0	1	1	0	1	1
Natabec	1	0	1	1	0	1
Visorbin	1	0	1	1	0	1
TOTAL	12	20	32	15	18	23
Calcium preparations:						
Neocalglucon syrup	1	0	1	1	0	1
Calcium capsule with viosterol	1	1	2	2	1	3
TOTAL	2	1	3	3	1	4
Sustagen	0	1	1	0	2	2
Arcofac	0	1	1	0	1	1

DRUGS AFFECTING THE AUTONOMIC SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Anticholinergics:						
Belaps	12	17	29	32	50	82
Probanthine	5	14	19	15	39	54
Scopolomine	78	2	80	49	2	51
Tincture of belladonna	8	11	19	20	25	45
Atropine	51	8	59	39	1	40
Pamine with phenobarbital	1	2	3	3	8	11
Nembudonna	0	4	4	0	8	8
Bellergal	0	2	2	0	7	7
Trasentine with phenobarbital	1	1	2	3	3	6
Artane	1	1	2	1	3	4
Tral with phenobarbital	0	2	2	0	4	4
Banthine	1	2	3	1	2	3
Pamine	1	0	1	3	0	3
Pathilon with phenobarbital	0	1	1	0	3	3
Tincture of hyoscyamus	0	1	1	0	3	3
Bardase liquid	1	0	1	2	0	2
Donnatal	1	0	1	2	0	2
TOTAL	161	68	229	170	158	328

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Sympathomimetics:						
Neosynephrine	3	7	10	15	7+	22+
Ephedrine	4	2	6	4	2	6
Tyzine	0	13	13	0	6	6
Vaponephrin	0	1	1	0	2	2
Benzedrex inhaler	0	0	0	0	0	0
TOTAL	7	23	30	19	17	36
Parasympathomimetics:						
Prostigmine	26	0	26	15	0	15
Ilopan	5	0	5	10	0	10
Urecholine	3	0	3	5	0	5
TOTAL	34	0	34	30	0	30
Anticholinergics with tranquilizers:						
Bentyl	1	2	3	2	4	6
Milpath	0	1	1	0	6	6
Combid	3	0	3	5	0	5
Tridal	0	1	1	0	4	4
Pathibamate	0	1	1	0	2	2
TOTAL	4	5	9	7	16	23

CHEMOTHERAPEUTICS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Sulfa compounds:						
Gantrisin	42	9	51	127	38	165
Sulfathaladine	13	1	14	37	4	41
Azogantrisin	12	0	12	38	0	38
Kynex	17	6	23	20	4	24
Sulspan	0	3	3	0	6	6
Triple sulfa	1	0	1	4	0	4
Suladyne	1	0	1	4	0	4
Sulfasuxidine	1	0	1	3	0	3
Midicel	1	1	2	1	1	2
Sulfadiazine	0	1	1	0	2	2
TOTAL	88	21	109	234	55	289
Furadantin	6	5	11	16	11	27
Antimalarials:						
Chloroquin	0	1	1	0	2	2
Aralen	0	1	1	0	1	1
TOTAL	0	2	2	0	3	3
Tuberculostatics (I.N.H.)	1	0	1	2	0	2
Koetil suspension	0	1	1	0	1	1

DRUGS THAT AFFECT THE RESPIRATORY SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Antitussive expectorants:						
Cyclohist	0	13	13	0	33	33
Elixir of terpin hydrate	4	17	21	5	9	14
Benalyn	2	1	3	7	4	11
Ambodryl	0	1	1	0	6	6
Tessalon	0	1	1	0	6	6
Emanuel cough syrup	0	1	1	0	5	5
Methejade	0	1	1	0	4	4
Toryn	0	1	1	0	4	4
Robitussin	0	1	1	0	3	3
Romilar	0	1	1	0	3	3
Cheracol	1	2	3	1	1	2
Tussin	0	1	1	0	0	0
TOTAL	7	41	48	13	78	91
Potassium iodide	4	23	27	4	67	71
Mucolytic agents:						
Alevaire	5	10	15	20	11+	31+
Dornavac	0	1	1	0	4	4
Mistagen	0	3	3	0	1+	1+
TOTAL	5	14	19	20	16	36

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Antispasmodics:						
Isuprel	3	6	9	7	14+	21+
Tedral	0	4	4	0	6+	6+
TOTAL	3	10	13	7	20	27
Antiseptics:						
Tincture of benzoin	4	6	10	5	3	8
Alcohol	1	0	1	1	0	1
TOTAL	5	6	11	6	3	9

DRUGS THAT AFFECT THE SKIN AND MUCOUS MEMBRANES

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Antiseptics and parasiticides:						
Furacin	7	5	12	16	11	27
Boric acid	2	12	14	1	21	22
Ammonium carbonate	0	2	2	0	14	14
Normal saline	3	5	8	1	10	11
Gentian violet	0	2	2	0	5	5
Borofax	0	1	1	0	2	2
Tinafax	0	2	2	0	2	2
ST-37	1	0	1	2	0	2
Bettman's ointment	0	3	3	0	1	1
Furasporin	0	1	1	0	1	1
Ammoniated mercury	0	2	2	0	0	0
Campho-phenique	0	1	1	0	0	0
Desenex	0	1	1	0	0	0
TOTAL	13	37	50	20	67	87
Drugs which soothe:						
Burow's solution	0	8	8	0	20	20
Sucrets	0	4	4	0	16	16
$MgSO_4$	0	4	4	0	6	6
Lanolin	0	2	2	0	3	3
Soda	3	4	7	2	1	3

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Zinc oxide ointment	1	2	3	0	3	3
Desitin ointment	5	0	5	2	0	2
Aveeno bath	0	2	2	0	2	2
Acid mantle creme	0	2	2	0	0	0
Calamine lotion	2	1	3	0	0	0
White ointment	0	1	1	0	0	0
TOTAL	11	30	41	4	51	55
Stimulants and irritants:						
White's A & D ointment	0	9	9	0	17	17
Tarquinor creme	0	2	2	0	3	3
Ichthyol	0	1	1	0	0	0
TOTAL	0	12	12	0	20	20
Antipruritics:						
Temaril	0	6	6	0	11	11
Caladryl	0	2	2	0	0	0
TOTAL	0	8	8	0	11	11
Anesthetic preparations:						
Nupercaine	2	6	8	0	3	3
Nuporal lozenges	2	1	3	0	2	2
Metycaine L & O ointment	1	0	1	1	0	1
Quotane	0	2	2	0	1	1
Auralgan	0	7	7	0	0	0

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Sulfurein base	0	1	1	0	0	0
Surfacaine ointment	1	0	1	0	0	0
Surfadil lotion	1	0	1	0	0	0
TOTAL	7	17	24	1	6	7
Astringents:						
Preparation "H" ung. tucks	1	0	1	0	0	0
Alcohol	0	6	6	0	5	5
TOTAL	1	6	7	0	5	5
Protectives:						
Dermaplast spray	1	0	1	2	0	2
Protogel	1	0	1	2	0	2
Zinc pulv.	1	0	1	0	0	0
TOTAL	3	0	3	4	0	4
Counterirritants:						
Analgesic balm	0	2	2	0	2	2
Keratolytics:						
Whitfield's ointment	0	1	1	0	1	1

DRUGS THAT AFFECT THE URINARY SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Diuretics:						
Diuril & Diamox:						
Diuril	4	45	49	6	71	77
Diamox	5	3	8	8	3	11
TOTAL	9	48	57	14	74	88
Mercurial Diuretics:						
Salyrgan	0	3	3	0	3	3
Mercuhydrin	1	1	2	1	1	2
Neohydrin	0	1	1	0	2	2
TOTAL	1	5	6	1	6	7
Saline Diuretics:						
Potassium chloride	2	2	4	3	4	7
Lilly's triplex	0	2	2	0	5	5
Potassium triplex	1	2	3	3	1	4
Ammonium chloride	1	0	1	4	0	4
TOTAL	4	6	10	10	10	20
Urinary analgesics:						
Pyridium	11	3	14	25	11	36
Urised	3	0	3	12	0	12
Cajandol	7	0	7	3	0	3
TOTAL	21	3	24	40	11	51
Benemid	0	4	4	0	16	16
Urinary antiseptics:						
Mandelamine	1	0	1	1	0	1

SKELETAL MUSCLE RELAXANTS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Synthetics:						
Disipal	0	9	9	0	29	29
Robaxin	0	4	4	0	9	9
Flexin	0	2	2	0	4	4
Paraflex	0	1	1	0	0	0
TOTAL	0	16	16	0	42	42
Mephenesin:						
Tolseran	2	8	10	5	22	27
Curare-like compounds:						
Tubadil	1	0	1	1	0	1

ANTISEPTICS AND DISINFECTANTS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Oxidising agents:						
Potassium permanganate	10	3	13	11	4	15
Hydrogen peroxide	2	0	2	5	0	5
Sodium perborate	1	0	1	1	0	1
TOTAL	13	3	16	17	4	21
Detergents:						
Zephiran	1	7	8	1	9	10
Cepacol	0	7	7	0	2	2
Ruson	1	0	1	1	0	1
Phisohex	0	1	1	0	0	0
TOTAL	2	15	17	2	11	13
Dyes:						
Mercurochrome	3	0	3	7	0	7
Acriflavin	0	2	2	0	2	2
TOTAL	3	2	5	7	2	9
Silver compounds:						
Silver nitrate	9	1	10	6	1	7
Iodine compounds:						
Wesecdyne	1	0	1	3	0	3
Chlorine compounds:						
Asochloramide	0	2	2	0	2	2

Rx MEDICATIONS

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Rx without identification	2	18	20	2	36	38
Rx (vitamin)	0	2	2	0	6	6
Rx (phenobarbital and atropine)	0	3	3	0	3	3
Rx (cough)	1	0	1	1	0	1
Rx (pain)	0	1	1	0	1	1
Rx (hormone)	0	2	2	0	1	1
TOTAL	3	26	29	3	47	50

DRUGS WHICH AFFECT THE REPRODUCTIVE SYSTEM

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Estrogens:						
Stilbesterol	10	2	12	8	3	11
Premarin	2	4	6	2	3	5
Theelin	1	3	4	1	3	4
Estrogen	1	2	3	1	1	2
Dalestrogen	1	0	1	1	0	1
Sulestrex	0	1	1	0	1	1
Taco	0	1	1	0	1	1
TOTAL	15	13	28	13	12	25
Androgens:						
Testosterone	4	5	9	2	2	4
Malandrin linguets	0	1	1	0	3	3
TOTAL	4	6	10	2	5	7
Progesterone	0	1	1	0	1	1
Pitocin	1	0	1	1	0	1

DRUGS WHICH AFFECT THE EYE

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Collyrium eye irrig.	0	6	6	0	18	18
Isuphren ophthalmic	0	1	1	0	4	4
Lacril eye drops	1	0	1	4	0	4
Neosone ophthalmic ointment	1	0	1	2	0	2
TOTAL	2	7	9	6	22	28

SERUMS AND VACCINES

Drug	Number of times ordered			Number of times administered		
	on Surgical Ward	on Medical Ward	Total	on Surgical Ward	on Medical Ward	Total
Tetanus toxoid	1	1	2	1	1	2
Gamma globulin	1	0	1	1	0	1
Mantoux test	0	1	1	0	1	1
TOTAL	2	2	4	2	2	4

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