

To Bill. Thanks and
deep respect for your
confidence and professional
contributions to my growth.
Professional & Personal Growth.
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NON-PRESCRIPTION MEDICATIONS: A SELECTIVE ASSESSMENT OF
NURSES' COGNITIVE KNOWLEDGE AND INFORMATION SOURCES AND OF
PHARMACISTS' KNOWLEDGE AND OPINIONS OF THEIR DRUG-ADVISORY
ROLE

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Under the supervision of Professor Kenneth W. Kirk

This study assessed nurses' knowledge before and after a workshop entitled "Uses and Misuses of Over-the-Counter Drugs." Nurses' sources of OTC information and purchases, and expected value of the workshop were determined. Pharmacists' (a) knowledge of OTC's; (b) opinions of their drug-advisory role; (c) interest in continuing education on OTC's; and, (d) extent of OTC advising were determined. Objectives centered around increasing nurses' knowledge of OTC's and interactions and awareness that all drugs can be misused. Enhancing pharmacists' advisory efforts was another objective.

Pretests and posttests were given the 44 nurses in Group I and the 52 nurses in Group II who participated in the study. Ninety pharmacists took the cognitive test formed from Part III of the nurses' pretest, and indicated the extent of their OTC advising. Ninety-eight pharmacists took a 20 item Opinionnaire designed on a four point Likert scale, and indicated their interest in continuing education on OTC's.

Results were analyzed by the one way analysis of variance and t tests. A reliability coefficient of 0.7149 was computed for the cognitive test.

Five year pharmacy graduates had significantly higher overall mean scores on the cognitive test than four year graduates. Those with less than 15 years tenure had significantly higher mean scores than those in practice 15 or more years.

Results of the Opinionnaire indicate that pharmacists (a) are willing to and do advise; (b) feel adequately informed to teach individuals and groups; (c) are less willing to teach groups; (d) recognize a responsibility to advise; (e) have good comprehension of OTC's; and (f) would welcome continuing education on OTC's.

Nurses averaged 83.8 percent correct on Part I (medical terminology) of pretest; 55.9 percent on Part II (uses and products); and 38.4 percent on Part III (ingredients, actions, and interactions). Most are introduced to OTC's via television; 88.5 percent purchase OTC's with varying frequencies; 51.1 percent purchase from neighborhood pharmacies. Nurses' mean percent correct scores rose from 38.4 percent on pretest to 77.9 percent on posttest.

Pharmacists' mean scores were significantly better than nurses' pretest scores on all but four of the 13 questions analyzed. Nurses' mean scores on the posttest were significantly higher than pharmacists' on four of the nine questions analyzed.

Further study is needed to assess consumers' receptivity to pharmacists' and nurses' advisory roles and the extent to which consumers use their services. Formal continuing education on OTC's needs to be offered to pharmacists and nurses.

Approved

Kenneth W. Kirk

Date

June 17, 1975

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OF NURSES' COGNITIVE KNOWLEDGE AND INFORMATION SOURCES
AND OF PHARMACISTS' KNOWLEDGE AND OPINIONS OF THEIR
DRUG-ADVISORY ROLE

BY

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A thesis submitted in partial fulfillment of the
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DEDICATION

TO MY PARENTS, OLIVER LANCELIN AND LECIA C. JOLIVET
LANCELIN, R.I.P., WHO GAVE ME THE
TENACIOUS WILL TO SEE A TASK THROUGH
TO ITS COMPLETION;

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LIVE BY THE SAME LEGACY.

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CHAPTER ONE

INTRODUCTION

If pharmacists claim to be professionals it is time we started acting like professionals. The area of non-prescription medication offers the pharmacist a heretofore unrecognized source for professional activity and satisfaction, a new involvement in professional activity. . . .¹

The duality of pharmacy's status as a profession and a business can be perplexing. Pharmacists have been challenged to offer a level of service which substantially could increase their professional involvement with consumers and other health professionals. Promulgation of the pharmacist's willingness, capability, and availability to counsel self-diagnosing patients could assist him in attaining professional maturity.

THE CONSUMER'S DILEMMA

Media advertising of non-prescription or over-the-counter (OTC) medications can be misleading. It can create over-confidence in the safety and efficacy of many of the products it promotes to the public. The availability of OTC drugs in non-pharmacy retail outlets coupled with exaggerated promotional claims can cause the consumer's false sense of security to increase while his felt need for professional advice diminishes.²

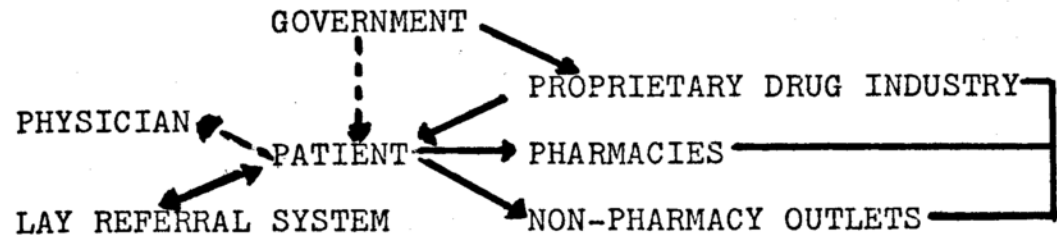


Figure 1. The System of Non-prescription Drug Use

Source: Mickey C. Smith and David A. Knapp, Pharmacy, Drugs and Medical Care (Baltimore: The Williams and Wilkins Company, 1972): 10.

Figure 1 shows that in the system of non-prescription drug use, the consumer is both the decision-maker and the purchaser. By contrast, the system of prescription drug use requires that decisions be made for the patient (consumer) by licensed prescribers. If a drug is not a prescription item, it can be sold in any retail outlet. It is estimated that pharmacies account for only 50 percent of sales of non-prescription medications. For the remaining 50 percent, there is no opportunity for professional monitoring or control. Although OTC drugs serve a useful purpose, the self-medication process requires professional assistance to help avoid misdiagnosis, improper drug choice, and inappropriate drug use.^{3,4}

As professional drug information specialists, pharmacists can provide consultative services to prescribers of prescription and non-prescription drugs. They also can

advise self-diagnosers on their selection and utilization of non-prescription drugs. This dual advisory role is important in avoiding prescription-nonprescription adverse drug reactions and interactions.⁵⁻⁷ The virtual non-acceptance of pharmacists as therapeutic consultants to physicians by colleagues in medicine and allied professions can cause negative reinforcement of consumers' image of pharmacists.⁸ Pharmacists, themselves, contribute to the consumer's dilemma by often failing to assume a professional responsibility for advising on and dispensing non-prescription medication.^{9,10} Too often, this responsibility is relegated to subordinates.¹¹⁻¹⁴

Steps to Solving The Dilemma

Perhaps the problem of pharmacist's involvement in OTC drug advising and the consumer's dilemma can be reconciled by examining several questions: (a) Does the area of non-prescription medication constitute professional practice for pharmacists? (b) If so, what is their role and how are they performing it? (c) Are other health professionals, especially nurses, equipped to function as non-prescription medication advisors? (d) Does the public want and need knowledge and understanding of over-the-counter medications? and, (e) To whom or where does the consumer turn for advice on these medications; are present sources adequate, accurate, and reliable?

DOES THE AREA OF NON-PRESCRIPTION MEDICATION CONSTITUTE PROFESSIONAL PRACTICE FOR PHARMACISTS?

Since the profession of pharmacy advocates a two-fold advisory/consultant role for pharmacists, it may be interesting to examine how these roles are perceived by medical and pharmacy practitioners. Although the therapeutic consultant function usually is associated with pharmacist-physician relationships, and the drug advisory role with pharmacist-patient relationships, the two functions are compatible and sometimes convergent.^{15,16} Pharmacists are intermediaries between physician and patient in the drug distribution system. Patients often consume prescription and non-prescription drugs concurrently. These drugs may interact with each other and/or with certain foods.¹⁷⁻²¹ Sometimes, patients fail to ask physicians about possible drug reactions and interactions while physicians often do not volunteer such information. In these cases, pharmacists can alleviate the problem of prescription/nonprescription drug interaction by properly advising patients who wish to purchase OTC medications while taking prescription medications.²²

Views of Physicians

Physicians hold divergent viewpoints regarding the pharmacist's two-fold consultant/advisory role. Speaking

at an American Pharmaceutical Association Convention in 1968, the President of the American Medical Association opposed pharmacy's advocacy of a therapeutic consultant role for pharmacists. He conceded, however, that pharmacists could: (a) improve the dissemination of information about drugs to the medical staff; (b) collect and correlate reports on the use and misuse of drugs; and (c) note adverse effects of drugs on certain patients.²³

At the same convention, the Director of the Food and Drug Administration stressed that pharmacists are advisors to both patients and physicians. Noting that enlightened physicians recognize this role as beneficial for patients, he said:

We desperately need professional intermediaries in drug therapy--pharmacists who understand patient attitudes, reactions, responses, and other physiological as well as psychological effects. . . The therapy advisor is the pharmacist in a new and more important role.²⁴

An investigation of physicians' perception of pharmacists' roles and utilization of pharmacy services found support for three propositions; pharmacists should: (a) be involved in patient care in hospitals; (b) serve in a closer drug advisory capacity; and, (c) be prepared to serve as medication consultants.²⁵

In another study of physicians' receptivity to pharmacists' changing professional roles, 43.2 percent of the pre-1950 graduates and 48.8 percent of the post-1950 graduates thought patients needed professional advice in purchasing over-the-counter drugs; 43.9 percent of the pre-1950 graduates and 50 percent of the post-1950 graduates thought pharmacist consultation on non-prescription drugs should be encouraged. Of all physician-respondents 79.9 percent said they did not wish to be contacted prior to purchase of non-prescription drugs.²⁶ Eighty-four percent of physicians surveyed in the Minneapolis area viewed the pharmacist as a health advisor to the public.²⁷

One physician expressed strong support for pharmacists as family health advisors when he said:

I am fully convinced that pharmacists can play perhaps the most significant role in maximizing the advantages and alleviating the dangers of self medication. . . I believe strongly that the role of the pharmacist in over-the-counter drugs should be analogous to the role of the physician in relation to the treatment he prescribes.²⁸

An Illinois study found that physicians and dentists surveyed strongly disapproved of pharmacists being consulted on general health problems by the public.²⁹

Thus, it appears that the medical profession does not hold a uniform view of the appropriateness of a therapeutic consultant role for pharmacists. They seem to approach more

uniformity regarding pharmacists serving as advisors on non-prescription medication.

Qualifications of the Pharmacist

By virtue of pharmacists' educational background and accessibility to the public, it would appear that they qualify as drug advisors for symptomatic illness before patients consult physicians. Curricula in schools of pharmacy include courses designed to provide extensive backgrounds in the chemical, physical, and pharmacological nature of drugs and drug products. Courses in physiology, anatomy, biopharmaceutics, and toxicology help equip the pharmacy graduate to evaluate chemical and biological entities used in drug therapy. Externship and internship experiences provide opportunities for pharmacy students to interact with patrons, pharmacists, nurses and physicians. Following licensure examination, pharmacists can continue to interact with colleagues and learn through various forms of continuing education. Pharmacists who do not use their education and experiences may stagnate. Neither the pharmacist, the physician, nor the patient benefits when pharmacists fail to exercise their professional judgments in advising on drug therapy.

Attitude of Pharmacists Toward Advising

Utilization of pharmacists as OTC drug advisors may depend upon the attitudes they hold and communicate to others about their professional responsibility.

A community pharmacist observed that pharmacists traditionally have professed professionalism. However, professionalism must be earned by the individuals seeking it and be recognized by the society giving it. Too often, commercialism hinders the judgment of pharmacists. He denounced pharmacists who sell OTC's on the basis of competitive marketing rather than on the basis of training and knowledge. He proposed that pharmacists offer consultations on a fee basis to civic groups, extended care facilities and private patients needing technical knowledge. This may help change attitudes of pharmacists and the public, alike.³⁰

A pharmacy educator wrote:

The issue of professional prerogatives implies the acceptance of professional responsibility. Enactment of laws will not correct professional ills. If pharmacists renounce their responsibility in dispensing OTC drugs, they will find it difficult to recover that responsibility at a later date. Those OTC's have gone both ways - out of the pharmacy and into the prescription room. It seems to me that our profession and the public are both losers in any case.³¹

This renunciation of professional responsibility may be attributable to attitudes of pharmacists. The necessity of pharmacists' professional involvement in advising on

proper use of OTC's is shared by other authors. They indicate a need for pharmacists to adopt positive attitudes toward OTC advising.³²⁻³⁵

The widely respected Task Force on Roles of the Practitioner of Pharmacy and the Subprofessional in Pharmacy recognized that the pharmacist's dispensing of OTC products is an appropriate professional role. By so doing, the Task Force said, pharmacists establish a relationship with patients which allows pharmacists to: (a) offer consultation to a patient; (b) volunteer professional advice; and (c) recommend referral to proper health-care professionals and agencies whenever appropriate. It also recommended that OTC's be included on patients' medication profiles.³⁶

Professional Resource Materials for Pharmacists

Organized pharmacy takes a positive position regarding pharmacists' involvement in OTC drug advising. To facilitate this role, the American Pharmaceutical Association has published annually since 1969 the Handbook of Non-Prescription Drugs. This reference text contains information on disease states for which a patient may self-medicate and current listing of ingredients found in specific OTC's along with their indications for use and contraindications.³⁷

The text, Without Prescription, also capsulizes information the pharmacist may use in advising patients on OTC's.³⁸

Articles on OTC's may also be found in various professional journals, trade publications, and newsletters.³⁹

HOW ARE PHARMACISTS PERFORMING AS OTC ADVISORS?

Techniques used by pharmacists to combat non-drug outlets for over-the-counter sales were reported in Pharmacy Times. Of the nine "practical ideas" given, only two did not emphasize merchandising: (a) include OTC products on patient profiles; and (b) invite questions as to the value of OTC products and how best to use them.⁴⁰

One pharmacist reportedly educates the public about drug products and the conditions they treat by writing weekly newspaper articles on the subject.⁴¹

A three-phase field experiment was conducted in 1969 to evaluate the pharmacist's performance as a drug advisor to physicians and to patients on both self-medication products and prescription medication. One phase showed that when confronted by a researcher posing as a diabetic and requesting Dristan, only six of 36 pharmacists gave the needed warning that Dristan is contraindicated for diabetic patients. As result of this study, the authors concluded:

It is painfully and deadly obvious that the pharmacists in our sample utterly failed the tasks presented them--failed to the point of exposing their patients to the unnecessary risk of death in the third phase.⁴²

A 1971 study asked pharmacists to rank six occupational role activities according to (a) daily amount of time spent performing each activity and, (b) what they preferred to do most and what they preferred to do least.⁴³ The results appear in Table 1.

TABLE 1

PHARMACISTS' RANKINGS OF ACTIVITIES WHICH WERE
(A) MOST OR SECOND-MOST TIME-CONSUMING AND (B)
MOST OR SECOND-MOST PREFERRED

On-the-Job Activity	Percent of pharmacists indicating the activity was most or second-most	
	Time-consuming N = 108	Preferred N = 108
<u>Professional</u>		
Making medical preparations	18%	31%
Dispensing prescription orders	95	78
Advising and discussing health problems	44	54
<u>Nonprofessional</u>		
Socializing with patrons	7	28
Handling patrons' purchases of OTC's	35	12
Handling patrons' purchase of nonmedical products and ser- vices	3	1

Source: Lawrence S. Linn and Milton S. Davis,
"Factors Associated With Actual and
Preferred Activities of Pharmacists,"
Journal of the American Pharmaceutical
Association NS 11 (October, 1971) : 547.

Although handling purchases of OTC products was listed as a nonprofessional activity involving 35 percent of pharmacists' time, and was a preferred activity by 12 percent, it should be noted that the more professional activity--advising and discussing health problems with patients--ranked high as both an actual and a preferred activity. Therefore, the pharmacists objected to handling OTC purchases, but not to advising patients about OTC drugs.

A comprehensive study reported in 1972 revealed that pharmacists were frequently utilized by the public for advice on specific symptoms. Table 2 summarizes the frequency of consumers' questions and the result of consultation with pharmacists.⁴⁴

It would appear that although pharmacists have a definite responsibility to advise patients on self-medication, they may vary in their performance of this function. Some are not performing in a desirable or acceptable manner. It has been stated that pharmacists have a legal responsibility to give appropriate warnings about the medication products they recommend and/or sell. They should make certain that employees do not give advice that only a pharmacist is qualified to give.⁴⁵

TABLE 2
USE OF PHARMACISTS FOR ADVICE ON SYMPTOMS

SYMPTOM	PERCENT OF PATRONS SEEKING ADVICE (N=5473)	FREQUENCY OF QUESTIONS (%)					RESULT OF CONSULTATION WITH PHARMACIST						
		Daily	Several/wk	Occasional	Hardly ever or never	No response	Recommend medicine or "See MD or DDS"	Other	Advice of R.Ph. (%)	Base Advice (%)	Followed Advice (%)	Cond'n Improved (%)	Later Saw M.D. (%)
Cough	13	42	42	11	2	3	93	3	3	204	95	84	20
Sinus Condition	3	25	43	26	2	4	84	13	3	56	97	81	38
Stomach-ache or upset	3	19	45	30	2	4	85	13	2	48	94	89	34
Toothache	2	14	45	34	2	4	88	12	-	32	100	81	76
Headache	1	26	34	31	6	3	87	9	4	23	100	78	23
Sleeping problems	1	11	28	50	7	4	77	16	7	13	93	69	31
Other health problems (Contraception) (Vitamins, tonics)	5	6	17	47	25	5							
		28	45	23	1	3							

Adapted From: Lecca. "Professional Myopia in Today's Health Crisis," Journal of the American Pharmaceutical Association NS12 (August, 1972), Tables I, II, and III, p. 420

ARE OTHER HEALTH PROFESSIONALS, ESPECIALLY NURSES,
EQUIPPED TO FUNCTION AS NONPRESCRIPTION MEDICATION
ADVISORS?

If professional advise on nonprescription drugs is needed, and if pharmacists are underutilized in or fail to perform this function, what other health professional is the public likely to consult? Nurses administer medications in a variety of institutional environments such as hospitals, nursing homes, schools, extended care facilities, industries, and in the patient's home. It is, therefore, likely that they are asked questions about medications.

Health professions are interdependent. Members of the health team must work together with each member contributing his highly developed skills and recognizing others' skills and contributions to the health of people. Coordination of their work is a necessity.⁴⁶

A 1966 survey indicated that more than half of the participating pharmacies provided nursing home patients with miscellaneous nonprescription drugs and supplies. Of these, OTC's, such as analgesics, were supplied by 93 percent of the pharmacies; antiseptics or disinfecting solutions by 46 percent; irrigating solutions by 36 percent; needles and syringes by 34 percent; and dressings by 30 percent. The OTC's were administered by nurses.⁴⁷

According to a study by National Analysts, Incorporated, self-medicators who use nutritional supplements received advice as follows: on vitamins--53 percent recommended by doctors, two percent by nurses, and three percent by pharmacists; on tonics--64 percent recommended by doctors, one percent each recommended by pharmacists and nurses.⁴⁸ The nurse and the pharmacist were cited as sources of diagnosis of asthma, allergies, high blood pressure, hemorrhoids, and arthritis/rheumatism, but only in a very small percentage of cases.⁴⁹

Qualifications of Nurses

Nursing is a profession whose purpose it is to promote optimum health through protective, nurtrative and generative activities. These activities are carried out within interpersonal, intrapersonal, and community systems. One of the protective behaviors involves shielding people from threats to their health, including misleading and improperly labeled drugs. The use of medication in the direct care of patients is one of the nurtrative behaviors, defined as those behaviors organized around the care, comfort and cure aspects of nursing.⁵⁰

Public health nurses provide services to individuals, families and groups. They participate in the diagnosis and

treatment of health problems and help identify community resources which can be used in solving these problems. They assist in bringing the professional services of physicians and pharmacists to the attention of individuals who need them.⁵¹

Hospital nurses are primarily concerned with the individual patient, while public health nurses are concerned with communities. It seems that pharmacists and nurses work together within their respected areas of competence.⁵²

One noted physician encouraged the pharmacist, nurse, and others to instruct the public on the usefulness of self-medication, while, at the same time encouraging the public to seek professional care if self-medication appears to be unwise.⁵³

Observing that the widespread use of prescription and nonprescription drugs often causes drug-induced disease, disability, or death, a physician has encouraged physicians, nurses, and pharmacists to cooperate in reducing the incidence of drug-induced disease and misuse of all drugs.⁵⁴ He noted that the nurse is involved within the hospital both in clerical and patient-care tasks related to medication. If she works in a physician's office, she may also spend much time dealing with medications.⁵⁵

A pamphlet for teachers of practical/vocational nursing is available as a guide to help "teach the knowledge, techniques and attitudes pertaining to drugs and their administration."⁵⁶ One of six objectives for this course is:

To instill in the student an awareness of the fact that a drug should be administered only on the basis of its possible actions, both favorable and unfavorable, and that any such administration should be followed by alert and intelligent observation and recording of the effects of the drug and a reporting of any untoward effects.⁵⁷

One unit included self-medication and the protection of the public against patent medicines. This unit has ten sub-topics to be taught in three to five clock hours.⁵⁸

A beginning course for nursing students proposed by a nurse-educator includes nine models, one of which focuses on the administration of medications. One of the seven objectives in this model is:

To be aware of the judicious use of drugs and the dangers of self-medication, as a basis for teaching the patient sensible concepts of drug usage.⁵⁹

This model outlines several essential science concepts relevant to self-medication: (a) self-medication always implies self-diagnosis and masking of symptoms may make future therapy difficult; (b) drug advertisements may be misleading and the availability of proprietary drugs fosters self-medication; and, (c) responses to self-medication may

be influenced by the individual's perception of the purpose of the drug, his emotional state, and his psychological expectations.⁶⁰

Nursing processes outlined in the model relate to knowledge of drug action as a basis for teaching patients sensible use of drugs. The dangers of concurrent administration of nonprescription drugs with prescription drugs, and encouraging skepticism of drug advertisements in the public media are other concepts included in the model. The shared responsibility of all members of the health team, with respect to community education and action in relation to drug usage, is stressed.⁶¹

Other authors have written:

The nurse has a grave responsibility in spreading the gospel of 'no self medication'. Nurses are just as prone as anyone else to think they 'know it all' about drugs. Because they study pharmacology and handle drugs continuously, it is only natural that nurses should feel that they know a great deal about medicines.⁶²

People are different. The nurse has limited knowledge of drugs, but she cannot always cope with situations in which sound advice on drug therapy is required. She has a responsibility, also, to her family, friends, and patients to be frank and tactful when asked about nonprescription medication. When she does not have answers, she should

refer patients to physicians, or to someone who has more knowledge than she.⁶³

Knowledgeable nursing educators are familiar with contributions and major changes in other health professions.

It has been written that:

A familiarity with these changes will facilitate interdisciplinary planning and programming. For example, if the nurse recognizes the pharmacist's role in health teaching as customers request over-the-counter drugs in the neighborhood drug store, he appreciates the need for more collaborative efforts in teaching about health.⁶⁴

It appears that nurses, too, have a role in the self-medication process. They are in close proximity to patients in a variety of situations. Sometimes, they are ill-equipped to give appropriate advice when asked for it. Pharmacists, because of their intensive education in drug therapy, can help improve nurses' abilities to advise patients on self-medication, even if only to encourage nurses to refer such patients to their pharmacist.

DOES THE PUBLIC WANT AND NEED KNOWLEDGE AND UNDERSTANDING OF OTC DRUGS?

National Analysts, Incorporated studied health practices and opinions of Americans "with emphasis on their susceptibility to health fallacies and misrepresentations which may cause unnecessary expense, injury or a poorer quality of

health care than that which is available."⁶⁵ Among their findings were: (a) gross misunderstanding of the term "bowel regularity" and practices involving use of laxatives; (b) a tendency for many self-diagnosers to rely on their own judgment when a physician's opinion conflicted with their own; (c) a tendency for these persons to self-medicate for common ailments, the younger ones often doing so for long periods of time; (d) a tendency for older people to self-medicate for serious ailments; and (e) a general disregard for reading labels on OTC medications.⁶⁶

The average citizen obviously does not visit a physician for every symptom or "minor" illness.⁶⁷ People desire and need knowledge of OTC medications. However, opportunities to learn how and when to self-medicate are not available extensively to the layman in the present formal educational system.⁶⁸

In 1964, professionals and laymen discussed the historical, legislative and therapeutic aspects of home medication at a national conference. The Chairman stated:

The use of home medication plays a role in the protection of health and supplements all other forms of treatment. . . Home medications, when used wisely in accordance with directions and information provided are not only useful but contribute importantly to the health of the American public and to the public welfare.⁶⁹

One speaker at this conference observed that people should be educated about health and first aid for their own good. Given such education, the vast majority of people use it wisely.⁷⁰ Another speaker underscored this observation when he said:

If the general public is kept fully informed by science writers and others through various media available to them, and if they have the security of knowing that their own physician is available, then proprietary medications assume their proper place in the broad panorama of medical care.⁷¹

The drug industry has a responsibility to define "limits with which self-medication is helpful, not harmful, and the responsibility of doing something to prevent abuse of these limits." Its obligation is to protect the public by "encouraging each individual to assume direct responsibility for his own self-medication." This requires a broad consumer education program.⁷²

These and other papers read at the conference recognized the importance of self-medication to the welfare of the layman. Most papers were subjective and not based on scientific research. None of the speakers were pharmacists. None spoke of the role of pharmacists with respect to advising on nonprescription drugs.

At a later conference it was observed that pharmacists are the logical persons to counsel patients; this would maximize both the effectiveness and the safety of OTC medications.⁷³

Discussing a philosophical approach to self-medication, it was noted that although self-medication is not without its dangers, it cannot be avoided. "The better informed individual is in a more favorable position to recognize the failure of self-medication when it occurs and to seek medical advice." This attitude should be "sympathetically regarded and carefully nurtured."⁷⁴

It also has been observed that OTC medications are less subject to misuse than prescription drugs because they are designed for: (a) treating minor ills; (b) fully labeled for self-medication, and (c) broad use within the family.⁷⁵

At least three volumes of testimony of Hearings before the Subcommittee on Monopoly of the Select Committee on Small Business, United States Senate, Ninety-Second Congress have been published. At the opening session, the Chairman remarked on the essentiality for the public to have objective and adequate information about self-medication products. He said:

If balanced and full disclosure is important for the doctor to prescribe intelligently, such information is even more important for the average citizen to medicate himself. The doctor has had training in the use of drugs; the average layman ...has had no training at all. To medicate himself intelligently, not only must the layman know the potentialities and limitations of the drug he wishes to use but also its place in the therapeutic scale.⁷⁶

From these comments on the importance of self-medication in the arena of health care, it can be assumed that the public needs to know about nonprescription products for self-medication. If the consumer is to use OTC products with discretion, it seems important that he understands the proper uses and their implications.

TO WHOM AND WHERE DOES THE CONSUMER TURN FOR ADVICE ON OTC MEDICATIONS?

Media advertising, friends, relatives, newspaper columns, and other publications are popular and accessible sources of information on self-medication products for the consumer. For example, see Table 3 below.

TABLE 3

SOURCES OF INFORMATION ABOUT NON-PRESCRIPTION OR OTC MEDICINES OR REMEDIES

Source	(N = 1321) Percent
Advertising media	43%
Recommendations of friends, relatives	23
Recommendations of druggist	20
Recommendations of doctor, dentist, practitioners	14
Label, package insert	13
In-Store Display	5
Read About It	4
None, Don't Know, No Answer	9

Source: "Appendix A, Selected Tables From the FDA-Sponsored Study: A National Opinion Survey With Respect To Informative Food Labeling, Poisonous Prevention Packaging, and Drug Labeling" (Mimeographed), Table 23.

A community pharmacist observed:

Since many of the lay public do not recognize the desired status of the pharmacist when they ask for advice, often they only want some reassurance on a predetermined product which will be purchased regardless of what the pharmacist says--the impact of mass media being the superior advisor.⁷⁷

So, it appears that, although consumers may get advice from pharmacists, they may have already made up their minds about the need for and the type of OTC to purchase.

It is reported that when purchasing OTC medications for the first time, consumers are concerned with: (a) what it treats, cures or prevents (24 percent); (b) brand or generic name (21 percent); (c) specific mention of active ingredients (15 percent); (d) price (12 percent); and (e) how much to take, how often and when (9 percent).⁷⁸

A representative of Consumer's Union recently stated:

Our work certainly has led us to believe advertising has contributed to public misconceptions as to the utility of, and need for, drugs. And certainly much of the OTC advertising in the health field has not helped the public understand the causes of health problems.⁷⁹

This representative detailed eight television commercials and one radio commercial for nonprescription drugs, and he suggested the need for content analysis of advertising themes and methods of presentation. He presented commentaries on the commercials which illustrated the range of problems inherent in OTC drug advertising. The consumer

is led to believe that "more ingredients are better; speed of relief is supreme; candy flavors are good; dangers of self-medication are overlooked; chronic conditions are fair game; and insignificant product differences are given great significance." The commercials suggest "desirable feeling states" and "undesirable feeling states" as OTC drugs are depicted as ready solutions for everyday problems.⁸⁰

For information regarding the incidence of self-medication for common ailments, as reported by National Analysts, Incorporated, see Table 4. It was noted that the figures may actually underestimate the incidence of self-medication for the ailments in question. "It seems likely that some respondents, in an effort to cast themselves in a favorable light, went too far in denying self-medication, which they know is frowned on by authorities as a principle."⁸¹

According to the Food and Drug Administration OTC Drug Review Panels, there are between 100,000 and 200,000 over-the-counter products formulated from only about 250 active ingredients, designed to alleviate about 30 symptoms.^{82,83} These and other sources indicate that it is difficult for consumers to make intelligent and discriminating choices for self-medication because of unique and competitive advertising. The efficacy claims on many advertised products have neither

TABLE 4

USERS OF SELF-MEDICATION: REPORTED INCIDENCE OF USE AND FREQUENCY OF USE

Ailment	Percent Reporting "Ever Using" N = 2389	Frequency (in Days) For Self-Medication					
		1-3	4-7	8-14	15-31	32-365	over 365
Sore throat	54	67	27	3	+	1	1
Coughs	56	53	36	7	2	1	+
Sinus Trouble	18	51	26	8	4	5	3
Head Colds	54	50	40	6	2	1	+
Hay Fever	8	35	28	9	8	12	5
Skin Problems	10	28	27	11	10	12	8
Helping Sleep	6	58	20	8	5	4	3
Upset or Acid Stomach	46	78	13	2	2	1	2
None of These	16						

Adapted From: National Analysts, Incorporated, A Study of Health Practices and Opinions, (Springfield, Va.: National Technical Information Service, Department of Commerce, 1972) : 125-127, 129-130, 145.

+ means less than 1 percent

been satisfactorily nor conclusively proved. Therefore, labeling of products needs to be revised and clearly written in laymen's terms; safety and efficacy of OTC's must be proven for advertised claims; and corrective advertising is essential for the protection of the consumer.⁸⁴

Books

In addition to advertisements, several textbooks on home medication and medical advising are available to the public. The Handy Home Medical Adviser offers suggestions on how to be a good patient for the doctor. It contains information on household remedies and suggests that they should have a definite action and contain only one active ingredient.⁸⁵

Consumer Union's The Medicine Show notes, in its first edition, that most ailments for which one purchases an advertised product are more annoying than dangerous; popular products overwhelm the public; the sellers of such products have become the prime source of medical education for the layman; and, many products are worthless. Further, this book is an attempt to provide an education on OTC's which is lacking in advertising.⁸⁶ Although largely oriented to the economics of OTC's, this book contains useful information on many categories of OTC products.

A Doctor's Quick Guide to Home Treatments For Over 200 Common Ailments claims to provide a "brass tacks" approach for treating over 200 diseases and accidents. It purports to be based on scientific findings approved by "the finest medical minds of the 70's" and to offer an "instant hospital" which will cause the reader to avoid running to the doctor or purchasing expensive pills. It lists "none built-in benefits," including immediate relief from pain, robust health, long-lasting cures, and economy. "Seven low cost items" which should be in everyone's medicine chest and twenty-one ways to use water as a medicine are given.⁸⁷ No mention is made of adverse drug reactions or drug interactions.

Of the available texts on nonprescription medication written for the public, perhaps the most explicit one is Without Prescription. Nonprescription medications are discussed according to comparative merits of the active ingredients. Brand-name products are listed following each therapeutic class of preparations discussed. Ingredients are evaluated with respect to their therapeutic uses, adverse reactions, interactions, side effects, and specific cautions to observe when using the products. Simple definitions of common disease conditions, known causes, symptomatic treatment, and precautionary measures are also

discussed.⁸⁸ This book appears to give accurate information while emphasizing that certain conditions require treatment by a physician, in which cases, prescription drugs may be needed.

From 1968-1971, The University of Wisconsin's Extension Services in Pharmacy offered public lecture-discussions on "Uses and Misuses of Nonprescription Medication" to Wisconsin residents. Audiences included people from all socioeconomic, geographic, and educational levels.⁸⁹⁻⁹¹ Although this service was discontinued in its original form, people continue to request organized discussions on OTC medications.⁹²⁻⁹⁴

SUMMARY

Questions regarding the roles, adequacy, and acceptability of pharmacists and nurses in OTC drug advising were posed. Attempts to answer those questions were made by citing literature references to related studies and health professionals' commentaries.

The importance of self-medication in the arena of health care was outlined. Sources of information and influences for the self-medicator and on the self-medication process were discussed.

It is evident that pharmacists may not be functioning as drug therapy advisors to the extent that is possible

and desirable. If this is true, the problem may be attributable to attitudes, available time, and/or feelings of inadequacy with respect to knowledge of nonprescription medications. On the other hand, nurses may sometimes function as drug therapy advisors to patients on OTC medications, or, to those taking prescription and nonprescription medications concurrently. This may be the case when patients ask nurses questions about drugs.

The question may be asked, then, are nurses really qualified to answer patients' queries about OTC's? An examination of pharmacists' knowledge and attitudes regarding nonprescription drug advising, and of nurses' knowledge and potential use of information on OTC drugs seems appropriate.

CHAPTER ONE

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CHAPTER TWO
THE PROBLEM AND METHODOLOGY

INTRODUCTION

Motivation for conducting this study stems from work initiated by the University of Wisconsin's Extension Services in Pharmacy in 1968. An educational service was offered to selected Wisconsin residents with the objective of helping them learn to use self-medication products with discretion and to seek advice on nonprescription medications from their pharmacist.¹⁻³

In early 1970, attempts were made to formally evaluate the effectiveness of a course on over-the-counter (OTC) medications taught to senior-citizen-aides in Milwaukee. Changes in knowledge and behaviors following completion of a sixteen clock-hour course extending over a four week period were evaluated. Results showed definite increases in knowledge of nonprescription medication.⁴ Some of the techniques and tools developed for this course were used in the present research.

Indications are that laymen use various advertising materials and television commercials as sources of information on OTC medications. A search of the literature did not reveal extensive documented involvement of pharmacists as advisors on nonprescription medications. Evidence

exists to support the premise that they should assume this role. Since professional advice is needed by laymen, it is suspected that nurses sometimes fulfill this function for laymen. Questions on nurses' qualifications to advise on medication usage arise. Likewise, a determination of pharmacists' involvement in advising and teaching others about OTC's needs to be made. This includes pharmacists' involvement in in-service training for nurses as well as their activities in advising laymen.

This latter point of view is substantiated by a proposed model for accommodating in-service training needs for nurses, health workers, dentists, physicians and other health personnel associated with neighborhood health centers.⁵ It has been observed that nurses are not trained to be pharmacists; yet pharmacists have relinquished much of their responsibility to nurses who compound more prescriptions in hospitals than pharmacists do in both community and hospital practice.⁶ Pharmacists are often underutilized in hospital and community drug distribution systems which results in inefficient and inappropriate uses of nurses' time and increases in the number of medication errors.⁷

STATEMENT OF THE PROBLEM

This research was undertaken to assess the effectiveness of continuing education on nonprescription medication

offered to nurses by a pharmacist-educator. It sought to determine nurses' knowledge of nonprescription medications and the practical value of this knowledge in their nursing practice. It also was intended to determine pharmacists' knowledge of selected nonprescription medications and their opinions and practices relating to their advisor-teacher role. This study ultimately will benefit laymen provided nurses and pharmacists become motivated to use any knowledge gained to effect and enhance efforts to teach and advise laymen on proper use of nonprescription medications.

SPECIFIC OBJECTIVES - NURSES

The objectives of this study for nurses are: (1) to increase awareness that all drugs can be misused and thereby encourage them to observe precautions when using, administering, or advising about drugs, especially nonprescription drugs; (2) to encourage them as health professionals and consumers to utilize pharmacists for nonprescription medication information; (3) to measure their current levels of knowledge about selected nonprescription medications and drug interactions, and to assess cognitive changes following participation in a continuing course on OTC medications; (4) to determine their current practices with respect to purchasing and learning about OTC medications; and (5) to determine the practical value of a continuing education course on nonprescription medications for nursing practice.

SPECIFIC OBJECTIVES - PHARMACISTS

For pharmacists, the objectives are to: (1) assess their willingness to engage in the teacher-advisor role with respect to nonprescription medications; (2) raise their levels of conscious effort to offer professional advice on nonprescription medications to non-pharmacists on an individual and a group basis; (3) determine their current practices with respect to advising on nonprescription medications; (4) determine their expressed needs for and interests in continuing education on nonprescription medications; (5) determine their quick recall of selected knowledge on nonprescription medications; and (6) determine their opinion on the carrying out of professional responsibilities to teach and advise on nonprescription medications.

DESIGN OF THE STUDY

This study is a modification of the "one-group pretest-posttest" and the "posttest only control group" designs described by Campbell and Stanley.⁸ Two different groups of nurses and two different groups of pharmacists participated in the study.

TABLE 5
PARTICIPANTS IN STUDY BY PROFESSION AND TEST INSTRUMENT

Profession	N	Test Instrument
Nurses (Group I)* (June, 1973)	44	Pre-test
	52	Post-test
	18	Post hoc evaluation
Nurses (Group II)* (Dec., 1973)	52	Pre-test
	50	Post-test
	39	Post hoc evaluation
Pharmacists (Group I) (October, 1973)	90	OTC Drug Knowledge**
Pharmacists (Group II) (April, 1974)	98	Opinionnaire

*Numbers taking pre and post test may vary because some came late. Analysis done on subjects who took both pre- and post-test.

**Same as Part III - Pretest, Nurses.

The two groups of nurses were given essentially identical pre-tests, instruction, and post-tests under similar conditions. A six month time interval separated the two testing groups. A sample of pharmacists received only one part of the pre-test. To determine opinions about advising on nonprescription medications, a second sample of pharmacists completed an opinionnaire.

The methodology for this study is presented in two parts--one for nurses and a second one for pharmacists.

Methodology - Nurses

Two different groups of nurses participated in this study. The methodology consisted of: (a) designing an eight clock-hour course of instruction on nonprescription medications to be offered to nurses for which they would receive six continuing education hours credit; (b) designing pre-test and post-test instruments; (c) developing handout materials for the courses; (d) publicizing the course; (e) enrolling registrants; (f) teaching the course and administering the test instruments; (g) gathering post-course evaluations; and (h) analyzing and interpreting the data.

Forty-four nurses registered and completed the first course - "Uses and Misuses of Over-the-Counter Drugs"-- in June, 1973. Publicity and registration details were handled by the nurse-continuing education agent, University of Wisconsin, Fox Valley Center, where the course was taught. Decisions on course objectives and content were made jointly by the nurse-continuing education agent and the instructor for the course. All test instruments and course materials were designed and developed by the instructor.⁹

The pre-test instrument¹⁰ was checked for appropriateness of content by the continuing education agent. Part I emphasized recognition of medical terminology for uses of

drugs; these were to be matched with layman's terms. Definitions were validated using appropriate medical and pharmacy glossaries.¹¹ These same definitions had been used previously and tested with various Wisconsin residents over a three-year period. One basis for including definitions in the pre-test was that individuals must be able to read and understand printed labels on OTC drug products if they are to make intelligent purchasing decisions.

To test nurses' knowledge of drug products, Part II of the pre-test required participants to match technical uses with names of fourteen products listed either generically or by trade names. Four of the medical-use terms required two answers, leading to a total of eighteen possible correct answers in this section. Technical, rather than laymen's names for medical uses were used to allow for checking nurses' understanding of Part I. This also allowed for cross tabulations to determine which uses were better understood.

Ingredients, uses, interactions, contraindications, and adverse reactions of over-the-counter preparations were emphasized in Part III, a fourteen multiple choice item test. Selection of content areas was based on decisions of categories to be included in the course. Validity of drug

interaction information and test questions were verified from published research articles and textbooks.¹²⁻¹⁶

Question #2, Part III was changed in pre-test given the second group of nurses. This was done because Group I nurses and pharmacists both scored very low on this question.

The first three sections of the pre-test were designed to gather data in support of objectives one and three presented on page three.

Parts IV and V were checklist and open-ended statements intended to determine nurses' purchasing habits and sources of information on OTC preparations. Their expectations of the value of the course, personally and professionally, also were obtained. These sections are related to objectives two and four listed earlier. Finally, nurses were asked to indicate the nature of their current nursing practice.

Pre-test instruments were administered during the first thirty minutes of the workshop.¹⁷ This was followed by an introductory lecture covering general information on drug labeling, factors influencing response to drugs, and other related information.¹⁸ The remainder of the morning session was devoted to detailed lecture-discussions on specific categories of nonprescription products. Following lunch, other categories of nonprescription medications were discussed, important drug interactions were covered, and hand-outs distributed.¹⁹ Nurses were divided into small groups

and given simulated case histories to discuss and make recommendations for solving the hypothetical problems. They also were asked to discuss and analyze the content of selected television commercials for OTC drugs.²⁰ The course ended following large group discussions and completion of twenty minute posttest.²¹

Section I of the post-test contained ten multiple-choice items randomly selected from Part III of the pre-test, but rearranged in order of presentation of the questions. Section II asked participants to list OTC-Rx-Food interactions for seven drug or food types. Although Parts I and II of the pre-test were not repeated in the post-test, it is unlikely that participants would have been able to answer post-test questions without an understanding of terminology of Part I of the pre-test.

To ascertain the change in knowledge, participants were identified by their social security numbers on pre-test and post-test. This allowed for matching scores.

Participants were instructed to submit to the course convener within two months following the course, a statement regarding the course's usefulness plus other comments. These statements were forwarded to the instructor.²² A cross-section of these statements is also analyzed in the data.

Six months following the first course, a similar course was given to a second group of fifty-two nurses at the University of Wisconsin Center, Green Bay. The same instruments and procedures were used with few exceptions, namely: (a) one item in Part III, pre-test was changed (discussed earlier); (b) this workshop was supplemented by use of overhead transparencies and, (c) two handouts not given to the first group of nurses.

Data were analyzed for frequency distributions, differences in pre- and post-test scores, and differences in scores between the two groups of nurses. Details of data analyses are presented in Chapter Four.

Methodology - Pharmacists

One basic premise of this study is the need to persuade people of the importance of consulting pharmacists for their self-medication needs. Pharmacists must demonstrate, however, their competency and willingness to advise people on accepted uses of nonprescription medications.²³

Upon relating the methodology used with nurses to colleagues in a pharmacy research seminar, the suggestion was made to test Part III of the pre-test instrument on pharmacists. In October, 1973, pharmacists attending the annual Wisconsin Pharmacy Institute at the Wisconsin Center, Madison were invited to participate in the study. Ninety

pharmacists responded. They were asked for demographic information relating to their type of practice, extent of formal education, size of community in which they practiced, and tenure of practice. In addition they were asked to estimate the frequency with which they advised their clientele on nonprescription medications.²⁴

The purposes of administering this test were to determine pharmacists': (a) quick recall of knowledge relating to nonprescription products and drug interactions; (b) extent of involvement in an advisor-teacher role; and (c) comparative scores based on demographic variables and relative rankings with nurses who took both pre- and post-tests.

Much has been written about pharmacists' roles and responsibilities as therapeutic advisor and drug information specialist, but little can be found on their attitudes and opinions about this role. It seems futile to promote the idea of using pharmacists as advisors on self-medication if pharmacists possess negative opinions about their professional responsibility.²⁵

To assess pharmacists' opinions on the advising and teaching of nonprescription drug usage to laymen, and to determine their expressed needs for continuing education programs in nonprescription medications, pharmacists attending the annual Spring Pharmacy Management Institute in

April, 1974 at Madison were invited to complete a twenty-item opinionnaire. One hundred pharmacists responded.²⁶

The opinionnaire statements were rated on a four point Likert scale. Items relating to the pharmacists' requirements of time, communications skills, teaching skills, and perceptions of need for providing advice were included. Demographic data similar to that requested on the cognitive test were gathered. Indications of interests in continuing education in this subject-matter area were requested.

PROCESSING THE DATA

Test instruments were coded in preparation for key punching and computer analyses. Each instrument was scored, coded and key punched. The STATJOB²⁷ computer programs were written for data analyses. Differences were significant at the p less than 0.05 level.

Numerical and percentage distributions for each test item and for each test section were tabulated for all sections of the test instruments. Mean percent correct scores for Parts I and II of the pre-test for nurses were computed and compared for differences between Group I and Group II nurses. A one-way analysis of variance was used to identify statistically significant differences (F ratio) between Group I and Group II nurses for Parts I and II of the pre-test.²⁸

A one way analysis of variance was used to determine significant differences between Group I and Group II nurses on Part III of the pre-test. Mean Scores for Parts I, II and III of the pre-test were totaled and a one-way analysis of variance was used to identify significant differences between Group I and Group II nurses. No significant differences were found; therefore, scores for Group I and Group II were combined and the nurses were treated as one group for analysis of individual questions in Part III of the pre-test and Part I of the post-test.

Mean scores for individual questions on Part III of the nurses' pre-test and for the pharmacists' cognitive test were analyzed for significant differences by use of the t-test.²⁹ Mean scores for individual questions on Part I of the Nurses' post-test and the pharmacists' cognitive test also were analyzed by use of t-tests. Total mean scores for the pharmacists' cognitive test were analyzed for significant differences among sub-groups of the demographic variables by use of the one way analysis of variance and the F ratio. Mean scores on individual items in the pharmacists' cognitive test were analyzed for statistically significant differences between two groups in the "highest degree" variable. The t-test was used for these analyses.

Mean scores were computed for the opinionnaire and analyzed for differences based on demographic variables. Responses to individual statements of three sub-groups of the "community size" variable and two sub-groups of the "tenure of practice" variable were analyzed for significant differences by use of the F test. The rankings of statements in the opinionnaire were identified for the total sample and for the five sub-groups analyzed.

RELIABILITY AND VALIDITY

"The problem of reliability is essentially one of determining the degree of consistency present in any set of observations or measurements."³¹ The reliability of a test tells how consistently the test measures what it purports to measure.³²

The cognitive test was analyzed for reliability by use of the FORTAP program.³³ This program determines the level of difficulty per item, the point on the criterion scale at which the item choice has maximum discrimination, the discriminating power of the item, and the reliability and standard error for the total instrument, by individual and by combined groups.

The difficulty level refers to the proportion of subjects who answer the question correctly. The larger the proportion who answer correctly, the easier the question.³⁴

This will correspond to the percents correct reported in this study. For nurses, the test was considerably more difficult than it was for the pharmacists. According to Ebel, "an item of middle difficulty is one for which the proportion of correct responses is midway between the expected chance proportion and 100 percent." He further states, "items in midrange of difficulty--30% to 70%--are almost as effective discriminators as are items of 50% difficulty."³⁵ For nurses on the pre-test, the item difficulty was well within range.

"It is desirable that the correct choice has a high positive biserial correlation (0.30 or greater) and that all incorrect choices have negative correlations (at least in the .20's or .30's) with the criterion."³⁶ The criterion, in this case, was the total test score received. For nurses, this biserial correlation was within the acceptable range.

"It is desirable that the beta value for the correct choice of an item have a high positive (0.30 or greater) value and that the incorrect choices all have negative (at least in the -0.20's and -.30's) beta values."³⁷ The beta value is the reciprocal of the standard deviation of the item characteristic curve and it gives the discriminating power of the item.³⁸ For most questions, the items were satisfactorily discriminating for nurses on the pre-test.

The Hoyt Reliability Coefficient is a reliability estimation for internal consistency.³⁹ The range of ability of a group being tested is one factor which affects the reliability of a test. Since there was no significant difference between the overall scores of Group I and Group II nurses, and, since nurses and pharmacists are both health professionals who may be involved in drug therapy, the groups were pooled to determine reliability for the cognitive test. A reliability of 0.70 to 0.79 is considered adequate for group measurement.⁴⁰ The reliability coefficient for the cognitive test was computed to be .7149, which was adequate for the intended purposes.

The validity of a test is said to be "the degree to which a test serves the purpose for which it is intended."⁴¹ One type of validity which has been identified by the Standards for Educational and Psychological Tests and Manuals is content validity.⁴² Content validity can be a subjective judgment of the relevance of a test; it refers to deciding whether the test is valid for the purpose for which it is to be used. It is established by logical examination of the test and the methods used in its preparation. It assumes that "(1) the area of concern to the tester can be conceived as a meaningful, definable universe of responses; (2) a sample can be drawn from this universe in some purposive,

meaningful fashion; and (3) the sample and the sampling process can be defined with sufficient precision to enable the test user to judge, on a logical basis, how adequately performance on the sample typifies performance on the universe."⁴³

The content validity of this test is directly related to the validity of the information contained in the pharmacy literature from which decisions on test items were made. Judging from pharmacists' general performance on the cognitive test, and from the differences shown between pharmacists' and nurses' scores, the test is considered valid. The test was intended to measure nurses' knowledge of selected OTC's and related information, both before instruction and after instruction. Judging from the change in mean scores for Part III of the pre-test and Part I of the post-test for nurses, it could be inferred that the test measured what it was intended to measure.

LIMITATIONS

Since pharmacists and nurses are not equivalent groups, the use of pharmacists' scores to determine baseline knowledge for nurses can be criticized. Comparison of the two groups of nurses is a more significant indication of baseline knowledge and changes in cognition than is comparison of nurses and pharmacists. However, pharmacists' mean scores can appropriately be used to measure criterion-related validity.⁴⁴

The study design did not require a control group of nurses. Extraneous intervening variables sometimes account for changes which may occur between pre- and post-test administration. Attempts were made to minimize this possibility by giving the pre-test, instruction, and post-test all on the same day. Therefore, no significant time lag or opportunities for other variables to intervene could occur in this closed group-testing situation.

There was no random sampling of participant-subjects. Nurses who were first to request enrollment were allowed to register for the course. The same statement can apply to pharmacists who took the cognitive test or opinionnaire; they were not drawn from a random sampling of pharmacists, but were a captive audience.

Cell sizes for some of the sample subgroups of pharmacists were too small to allow for significant comparisons.

Although instruments used in this study were reviewed by colleagues in pharmacy, only the reasonableness of content was pre-tested by a nurse. Nurses in Group two, however, were administered tests that had been used by a similar group of nurses. This would seem to validate appropriateness of format and content of the instruments. The instruments should have been more extensively pre-tested with both nurses and pharmacists.

CHAPTER TWO

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19. See Appendices 16-22.
20. See Appendix 26.
21. See Appendices 2 and 4.
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23. A Summary: "Communicating the Value of Comprehensive Pharmaceutical Services to the Consumer," Journal of the American Pharmaceutical Association NS 13, (January, 1973) pp. 23; 28.
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CHAPTER THREE

PRESENTATION AND ANALYSIS OF DATA: PHARMACISTS

INTRODUCTION

As drug information specialists, pharmacists profess to own a degree of drug knowledge that is unexcelled by any other profession. Utilization of this knowledge in his capacity as advisor to self-medicating patients is a professional responsibility. Effective performance of this advisory role mandates that pharmacists be patient-oriented and exhibit discretionary communicative, teaching and evaluative skills. The willingness to advise is also essential.

To determine pharmacists' knowledge of OTC's and their opinions regarding advising patients on OTC's, two different groups of pharmacists were tested. Accordingly, data are presented and results analyzed in two primary sections: (1) pharmacists who completed the cognitive test; and (2) pharmacists who completed the opinionnaire.

OTC DRUG KNOWLEDGE

Ninety pharmacists attending the October 1973 Wisconsin Pharmacy Institute in Madison completed a 14-item multiple-choice test entitled "General Knowledge of Over-the-Counter Drugs."¹ This test was essentially the same as Part III of pre-tests given nurses in June 1973 and December 1973.

Pharmacists were asked to indicate the extent to which they advised patients about OTC's on an individual and a group basis.

For purposes of this study, alcoholic beverages are considered nonprescription drugs. Therefore, several questions relating to adverse reactions and contraindications of alcohol with prescription drugs and OTC's are included in this test. The rationale for this is based on the belief that many patients may not comprehend the importance of avoiding alcohol when taking certain medications. It seems important that they be cautioned by the pharmacist.

Demographic Variables

Important demographic characteristics of participating pharmacists appear in Table 6. These are used as test variables in analyzing findings. Nearly two-thirds of the sample are engaged in community pharmacy practice. Most practice in communities which have 25,000 or more residents. Their average tenure of practice was computed to be 12.5 years, and there is nearly an equal distribution of four and five-year Bachelor of Science in Pharmacy degree recipients in the sample.

TABLE 6

DEMOGRAPHIC CHARACTERISTICS: PHARMACISTS TAKING COGNITIVE TEST

(N = 90)

Type of Practice	N	Percent (%)
Community (1-2 Owner)	38	42.7%
Small Chain (2-3 stores)	5	5.6
Large Chain (4 or more stores)	9	10.1
Clinic/Nursing Home	4	4.5
Total Community Pharmacy	56	62.9%
Private Hospital	23	25.8%
Public Hospital	7	7.9
Total Hospital Practice	30	33.7
Administration	1	1.1
Community/Hospital	2	2.2
Total Other	3	3.3
Grand Total	89*	99.9%

<u>Size of Community</u>	<u>N</u>	<u>Percent (%)</u>
5,000 or fewer residents	9	10.1%
to 9,999 residents	10	11.2
to 15,000 residents	4	4.5
to 49,999 residents	16	18.0
50,000 or more residents	50	55.6
Grand Total	89*	100.0%

<u>Highest Degree</u>	<u>N</u>	<u>Percent (%)</u>
Ph.C or Ph.G	2	2.3%
Bachelor of Science, 4 year	42	48.3
Bachelor of Science, 5 year	40	46.0
MBA, Hospital Administration	1	1.1
B.S. 4/ B.S. Chem.	2	2.3
Grand Total	87**	100.0%

<u>Tenure of Practice</u>	<u>N</u>	<u>Percent (%)</u>
Intern	1	1.1%
1 - 4 years	26	28.9
5 - 10 years	14	15.6
11 - 15 years	10	11.1
16 - 20 years	15	16.7
Over 20 years	24	26.7
Grand total	90	100.1%***

* one did not respond.

** three did not respond.

*** due to rounding.

PRESENTATION OF DATA: PHARMACISTS AS A GROUP

Distribution of responses to test questions appears in the appendices.² No question was correctly answered by 100 percent of the pharmacists. There were few "no responses."

Discussion: Analgesic-Antipyretic Questions

Pharmacists scored best on Question 3 which asked them to select the preferred analgesic-antipyretic alternative to aspirin. The correct answer, acetaminophen, was chosen by 97.8 percent of the respondents. They did less well on Question 14 which relates to adverse reactions and interactions of aspirin. A total of 46.7 percent correctly answered that large doses of aspirin can (a) cause ototoxicity; (b) cause bleeding in the gastro-intestinal tract; and, (c) interact with anticoagulants. Another 43.3 percent did not recognize that aspirin can cause ototoxicity, but did recognize its implication in GI tract bleeding and interaction with anticoagulants.

The Handbook of Non-Prescription Drugs and other references describe several contraindications to the use of aspirin. Among them are hypersensitivity, gastro-intestinal disturbances, ototoxicity, interactions with certain prescription drugs, and interference with selected clinical tests. Specifically, it is observed that daily doses of 3 - 8 grams of aspirin cause tinnitus or "ringing in the

ears," vertigo and bilateral hearing loss. This toxic effect (ototoxicity) is often used to "titrate" blood levels of aspirin in arthritics. There is also evidence that sensorineural hearing loss may occur following small doses of aspirin.³

Among the analgesic-antipyretic drugs of the aminophenol group, acetaminophen is given as the drug of choice. Compared with aspirin, acetaminophen is stable in liquid form, does not cause gastric mucosal damage and bleeding, and can be used by persons allergic to salicylates. However, it lacks the anti-inflammatory action characteristic of aspirin. Occasional use (2 doses of 650 mg. given 4 hours apart) has no effect on prothrombin time in patients receiving anticoagulant therapy.⁴

Perhaps pharmacists did not understand the meaning of "ototoxicity." It might be thought that more pharmacists should have been aware of the implications of ototoxicity accompanying the use of aspirin. This knowledge would enable pharmacists to allay fear as they advise patients who may experience this side effect.

Complete familiarity with the contraindications of aspirin and the indications for acetaminophen seems essential for pharmacists if they are to perform the role of drug advisors to self-medicating patients. This is made more important when one considers that analgesic-antipyretic

OTC's are among the most widely used products by the self-medicating public.

Discussion: Questions on Products for Symptomatic Relief of the Common Cold:

The use of dextromethorphan as a cough reflex suppressant was correctly answered by 96.7 percent of the 90 respondents. Only 55.6 percent named ammonium chloride as the correct choice for alleviating productive coughs. Forty percent named codeine. It was expected that pharmacists would have been more discerning on this latter question. It is suspected that they experienced confusion in interpreting the terms "productive cough" and "alleviating."

Wise counsel on self-medication for coughs should reflect the pharmacist's understanding of (a) the nature of the cough reflex; (b) the relationship of acute and chronic respiratory diseases to persistent cough and the corresponding rationale for recommending or discouraging symptomatic self-treatment; and (c) mechanisms by which popular anti-tussive agents bring about their palliative effects.⁵

Coughs may be nonproductive, giving the sensation of tightness and tickling in the respiratory tract. In such cases, suppression by use of a cough reflex suppressant may be indicated. On the other hand, coughs may be productive. This implies that there may be heavy bronchial congestion

and drainage of nasal secretions into the respiratory tract. Symptomatic treatment requires products that will decrease the viscosity of the congested fluids to facilitate their expectoration. Expectorants such as ammonium chloride serve this purpose. Suppression is indicated only as a means of allowing the patient to rest.⁶

Of the 73 examples of OTC antitussives listed in the Handbook, the non-narcotic cough suppressant, dextromethorphan, is included in 43 products. A total of 28 do not include a non-narcotic cough suppressant. Codeine, a narcotic, is included in 11. The expectorant, ammonium chloride, is an ingredient in 25 of these products. Eight do not include an expectorant ingredient.⁷ Were pharmacists more familiar with the differences between a productive and a nonproductive cough, and had they a better grasp of information given in either the Handbook or the product literature and labels, they would have scored higher on Question 13 of this test.

Questions 4 and 10 also relate to symptomatic treatment of the common cold. Only three pharmacists indicated that Contac, a widely advertised product containing phenylpropanolamine, had none of the adverse reactions listed. A total of 77.8 percent recognized that Contac could cause a hypertensive crisis, or cardiac palpitation, and could interact with certain antidepressants. The remaining 18.9 percent

showed some recognition of possible adverse effects of Contac.

Regarding Question 10: "When it is necessary to use a 'nasal decongestant' for more than two days, the preferred dosage form is...", 77.8 percent correctly answered: "a capsule, tablet, or liquid taken orally." A total of 21.1 percent chose "aqueous nosedrops" as the correct answer.

The side effects, adverse reactions and drug interactions of sympathomimetic amines are extensively documented. The handiest reference is the Handbook of Non-Prescription Drugs, but other sources in the literature on drug interactions also outline these effects.^{8,9} Many "cold remedies" contain a sympathomimetic amine as one of their ingredients. The products usually are labeled to warn not to use the preparation if one has hypertension, diabetes, thyroid problems or heart disease. However, it is suggested by several studies that many people do not read labels.^{10,11} Also, these products are widely available in non-pharmacy retail outlets. If pharmacists are to be a factor in causing these products to be returned to the pharmacy shelves, it would seem appropriate for them to understand and be able to enumerate possible adverse reactions to patients. Otherwise, patients may continue to

purchase these products from non-pharmacy outlets without the benefit of good professional advice.

Regarding nasal decongestants, it has been said that inhalants, nose drops, and nasal sprays are poorly distributed when administered into nasal passages. The copious mucous blanket present in the nose during the common cold fails to permit satisfactory local absorption. Indiscriminate use may result in an undesirable nasal mucosal pathology and secondary infection. Oily nosedrops are particularly dangerous. Oral administration had the following advantages: it (a) permits medication to reach all respiratory membranes via the blood supply; (b) is unaffected by the amount or character of the mucous; (c) does not cause rebound congestion; (e) is easily administered with accurate dosage; and (f) does not cause pathological changes in the nasal mucosa.¹²

Pharmacists who answered that the preferred dosage form is "aqueous nosedrops" were, perhaps, comparing types of vehicles for nosedrops instead of comparing types of dosage forms. It is true that aqueous nosedrops are preferred over oily ones, but this was not the question asked. It was hoped that pharmacists would have remembered the concept of rebound congestion that is implicated with overuse of nosedrops, and, consequently would have made the

correct choice of "an oral-type product." For nearly one-fourth of them, this did not happen.

Discussion: Drugs Acting on the GI Tract:

It has been said that there is no class of nonprescription drugs in which professional guidance is needed more than in the use of laxatives.¹³ It also has been stated that the antacids offer an opportunity for the practitioner to provide a real service in terms of knowledgeable and informative counsel.¹⁴

Only 12.2 percent of the sample recognized that the mechanism of action of saline cathartics is centered in the small intestines where water volume is increased to effect mechanical purgation. (Question 7). A majority, 68.9 percent, of the respondents named "increasing volume of water retained in the large intestines and mechanically stimulating purgation" as the correct choice. Pharmacists knew that saline cathartics act by changing the osmotic environment in the gastrointestinal tract, but they were unsure that the site of action is the small intestines. Here is one additional example of knowledge that drug information specialists should have if they are to distinguish themselves from "the average" non-pharmacy professional or layman.

Mineral oil is an emollient, fecal-softening type laxative which retards gastric emptying time if taken with meals. When taken indiscriminately, it can cause lipid pneumonia.¹⁵ It is not a bulk-forming laxative. Although 56.7 percent of the pharmacists correctly responded that mineral oil "can cause lipid pneumonia," the distribution of the other responses is somewhat more interesting. Six pharmacists (6.7 percent) thought mineral oil was a bulk-forming laxative; 15 (16.7 percent) said it was a stimulant laxative; 11 (12.2 percent) decided it increases gastric emptying time; and 7 (7.8 percent) gave no response. Apparently, pharmacists were thinking of mineral oil as a laxative only, and did not remember its use in other pharmaceutical oral or topical products. The precautions and implications of mineral oil as a cause of lipid pneumonia have been known for a long time. Yet, few pharmacists recalled these facts.

Pharmacists scored higher on the antacid questions than on the laxative ones. Question 9 was correctly answered by 94.5 percent: "sodium bicarbonate...stimulates the production of HCl, may cause alkalosis." Similarly, 96.7 percent knew that calcium-containing antacids and milk can interfere with the absorption of tetracycline. It is apparent that these respondents had adequate recall of information asked about antacids.

Discussion: Drug Interaction With Alcohol Questions:

Only 41.1 percent of the pharmacists knew that the primary reason for contraindicating concurrent administration of alcohol and tolbutamide is due to the competitive inhibition which occurs during metabolism of the two drugs. A surprising 54.5 percent thought alcohol increases the rate of metabolism of tolbutamide. It also is surprising that 11.1 percent chose the alternative: "CNS stimulant action is potentiated," although 86.7 percent of the respondents knew that concurrent administration of alcohol and barbiturates is contraindicated because "central nervous system depressant action is synergized."

Indications are that the metabolism of alcohol is antagonized or blocked by concomitant administration of oral antidiabetics.¹⁶ Sedation (CNS depression) with alcohol is potentiated by concurrent administration of barbiturates, morphine analgesics, and other central nervous system depressants.^{17,18}

Drug interactions are implicated in many hospital admissions for drug-induced diseases. Estimates vary from one-third to 85 percent of hospital admissions are due to drug-induced disease.^{19,20} It seems essential for pharmacists to know common drug interactions if they are to perform as proficient therapeutic consultants and medication advisors.

Other Questions:

On Question 8, "Many over-the-counter 'sleep aids' contain, as their active ingredient, an...", 95.6 percent correctly answered "antihistamine."

Question 2 concerned product formulation and its effect on the rates of dissolution and onset of action of drugs. Because the alternatives were not clearly stated, the "correct response" was subject to debate; therefore, the question was not included in the analysis.

Discussion

Pharmacists need to maintain competencies in the area of OTC drugs. Reading professional literature and formal participation in continuing education opportunities can assist pharmacists in maintaining their professional competencies. Since pharmacists in this study did not perform to their maximum capacities, it seems appropriate that continuing education in this area be offered them.

PRESENTATION AND ANALYSIS OF DATA BY DEMOGRAPHIC VARIABLES

Correct responses to the OTC cognitive test by demographic variables appear in Tables 7 through 13.

Knowledge Versus Highest Degree

Because the sample is nearly equally divided into four and five year Bachelor of Science in Pharmacy degree

recipients (BS4 and BS5), these two sub-samples were selected for detailed analyses. Table 7 shows that BS5 degree recipients scored a mean of 76.0 percent correct, and BS4 degree recipients scored a mean of 69.6 percent correct. The difference was statistically significant.

TABLE 7

PHARMACISTS' CORRECT RESPONSES TO COGNITIVE TEST:
KNOWLEDGE VERSUS HIGHEST DEGREE RECEIVED*

Highest Degree	Mean Score	N	Percent	Standard Deviation
Bachelor of Science (4 year)	9.05	42	69.6 %	1.31
Bachelor of Science (5 year)	9.88	40	76.0	1.45
Totals	9.45	82	72.7	1.43

$$F(1,80) = 7.37 \quad (\text{Sig.})$$

*Shown only for BS4 and BS5 degree recipients.

It is suggested that the significant difference may be attributed to the change in the length of the pharmacy curriculum from four to five years. Also, the concept and importance of drug interactions came into existence only within the last decade. Consequently, drug interactions

was not emphasized until recently. Students matriculating in the four year curriculum, therefore, did not have extensive instruction on the importance of observing and reporting drug interactions. It can be argued that four year graduates have had opportunities to learn about drug interactions through continuing education. Yet, indications are that more of these graduates need to study drug interactions of prescription-nonprescription-food types, if they are to understand the concept and put it into their daily professional practice.

Closer analysis of individual questions appears in Table 8. The sample includes 42 BS4 graduates and 40 BS5 graduates. Percentages shown in Table 8 represent the percent of total BS4 graduates and of BS5 graduates who answered correctly. These data reveal that BS4 graduates scored better than BS5 graduates on Questions 8, 9, and 11. There was a statistically significant difference in Question 9. For all other questions, BS5 graduates scores higher than BS4 graduates, but a statistically significant difference was found for Question 14 only.

A total of 54.4 percent of all pharmacists in the sample incorrectly answered that concurrent administration of tolbutamide and alcohol is contraindicated because "alcohol increases the rate of metabolism of tolbutamide."

TABLE 8
COMPARISON OF PHARMACISTS' CORRECT RESPONSES TO COGNITIVE TEST QUESTIONS BY
HIGHEST DEGREE RECEIVED*

Number and Type Question	BS4 (N = 42)		Highest Degree BS5 (N = 40)		Statistic** (t test)
	N	Percent	N	Percent	
1. Rationale for contraindicating concurrent use of alcoholic beverages and barbiturates.	37	88.1%	36	90.0%	0.275 (N.S.)
3. Alternative analgesic-antipyretic drug of choice to aspirin.	40	95.2	40	100.0	1.408 (N.S.)
4. Adverse reactions to phenylpropanolamine.	31	73.8	33	82.5	1.092 (N.S.)
5. Rationale for contraindicating concurrent administration of tolbutamide and alcohol.	16	38.1	19	47.5	0.859 (N.S.)
6. Use of dextromethorphan.	40	95.2	40	100.0	1.408 (N.S.)
7. Mechanism of action of saline cathartics.	5	11.9	5	12.5	0.073 (N.S.)

*Shown only for BS4 and BS5 degree recipients.
Note: Question 2 was omitted from analysis because of lack of clarity of alternative choices and consequent debate over which choice was the correct choice.

TABLE 8 (CONTINUED)
 COMPARISON OF PHARMACISTS' CORRECT RESPONSES TO COGNITIVE TEST QUESTIONS BY
 HIGHEST DEGREE RECEIVED

Number and Type Question	BS4 (N = 42)		Highest Degree		Statistic (t test)
	N	Percent	BS5 (N = 40)	Percent	
8. Active ingredient in OTC sleep aids.	42	100.0%	38	95.0%	-1.479 (N.S.)
9. Harmful results of chronic use of sodium bicarbonate.	42	100.0	35	87.5	-2.364 (Sig.)
10. Preferred dosage form for longer use of decongestants.	31	73.8	33	82.5	1.092 (N.S.)
11. Adverse reactions to mineral oil.	24	57.1	22	55.0	-1.919 (N.S.)
12. Interaction of antacids, milk and tetracycline.	40	95.2	40	100.0	1.411 (N.S.)
13. Drug of choice for productive coughs.	20	47.6	26	65.0	1.589 (N.S.)
14. Adverse reactions of aspirin	12	28.8	28	70.0	3.712 (Sig.)

Of these, 54.8 percent are BS4 graduates and 52.5 percent are BS5 graduates. (Question 5). Of the 41.1 percent of total sample who correctly answered that these two drugs "competitively inhibit each other's metabolism," 38.1 percent are BS4 graduates and 47.5 percent are BS5 graduates. In other words, 43.2 percent of all pharmacists who correctly answered this question are BS4 graduates, and 51.4 percent are BS5 graduates.

On Question 14 which concerns adverse reactions of aspirin, 59.5 percent of the BS4 graduates recognized that aspirin can cause bleeding in the gastro-intestinal tract and can interact with anticoagulants. These respondents failed to recognize the implications of aspirin in ototoxicity. Only 30 percent of the BS5 graduates missed this adverse reaction of aspirin. A larger percentage of BS4 graduates also incorrectly answered Question 4 which related to adverse reactions of phenylpropanolamine.

Four-year graduates seemed to do better on questions about older products used in medicine such as sodium bicarbonate, mineral oil, and antihistamine methapyrilene. Neither group scored well on Question 7 which related to the mechanism of action of saline cathartics.

Knowledge Versus Tenure of Practice

Greater discrepancies in total scores were found when the sample was divided into those pharmacists who had practiced less than 15 years and 15 or more years. Those who had practiced a shorter period of time scored an average of 75.2 percent correct, while those with 15 or more years tenure averaged 67.5 percent correct as shown in Table 9. This difference was statistically significant.

TABLE 9

PHARMACISTS' CORRECT RESPONSES TO COGNITIVE TEST:
KNOWLEDGE VERSUS TENURE OF PRACTICE

Tenure of Practice	Mean Score	N	Percent	Standard Deviation
Less than 15 years	9.78	50	75.2%	1.43
15 or more years	8.77	39	67.5	1.60
Totals	9.34	89*	71.8	1.58

$$F(1,87) = 9.86 \quad (\text{Sig.})$$

*There was one "no response."

Pharmacists who have practiced less than 15 years may also have completed the five year pharmacy curriculum, and thus, may have had formal instruction on drug interactions and

adverse reactions. Those with 15 or more years probably did not study drug interactions while matriculating under the four year curriculum.

Knowledge Versus Type of Pharmacy Practice

Fifty-six pharmacists in the sample were engaged in community pharmacy practice and 30 in hospital pharmacy practice. Two reported both hospital and community practice, one reported "administration," and one did not respond. These latter four were eliminated from the analysis.

Table 10 shows that hospital pharmacists scored a mean value of 4.5 percentage points better than community pharmacists, but this difference was not statistically significant.

TABLE 10

PHARMACISTS' CORRECT RESPONSES TO COGNITIVE TEST:
KNOWLEDGE VERSUS TYPE OF PHARMACY PRACTICE

Type of Practice	Mean Score	N	Percent	Standard Deviation
Community	9.09	56	69.9%	1.60
Hospital	9.67	30	74.4	1.52
Totals	9.29	86*	71.5	1.59

$$F(1,84) = 2.64 \quad (N.S.)$$

*Does not include: 1 no response; 2 in both hospital and community practice; and 1 in administration

As a group, community pharmacists did not answer any question 100 percent correctly. Hospital pharmacists were 100 percent correct on Questions 1, 3, and 6. Community pharmacists scored better than hospital pharmacists on Questions 7 and 9, and the two groups were approximately equal in mean scores on Questions 4 and 12. For all other questions, hospital pharmacists scored higher on the average than community pharmacists. Table 11 shows these results by Question number and percent correct.

TABLE 11

COMPARISON OF CORRECT RESPONSES OF HOSPITAL AND
COMMUNITY PHARMACISTS TO COGNITIVE TEST

Question Number	Community (N = 56)		Hospital (N = 30)	
	<u>N</u>	<u>Percent</u>	<u>N</u>	<u>Percent</u>
1.	39	69.6%	30	100.0%
3.	54	96.4	30	100.0
4.	43	76.8	23	76.7
5.	21	37.5	15	50.0
6.	53	94.6	30	100.0
7.	9	16.1	2	6.7
8.	53	94.6	29	96.7
9.	53	94.6	28	93.3
10.	42	75.0	24	80.0
11.	29	51.8	19	63.3
12.	54	96.4	29	96.7
13.	33	58.9	14	46.7
14.	21	37.5	17	56.7

Knowledge Versus Community Size

Table 12 indicates that pharmacists who practiced in larger communities (More than 50,000 residents) scored 2.3 percentage points higher on the cognitive test than those who practiced in smaller communities. This difference was not statistically significant.

TABLE 12

PHARMACISTS' CORRECT RESPONSES TO COGNITIVE TEST:
KNOWLEDGE VERSUS COMMUNITY SIZE IN WHICH PHARMACISTS
PRACTICE

Community Size	Mean Score	N	Percent	Standard Deviation
50,000 or fewer residents	9.18	39	70.7%	1.76
Over 50,000 residents	9.48	50	72.9	1.45
Totals	9.35	89*	71.9	1.59

$$F_{(1,87)} = 0.78 \quad (\text{N.S.})$$

*There was one "no response."

Knowledge Versus Advice on One-to-One Basis

A total of 65 respondents indicated they advise individual patients about uses and misuses of nonprescription drugs. This represents 72.2 percent of the total sample. Pharmacists who reported extent of advice as up to 10 times daily had a mean score of 69.6 percent correct; those who reported advising up to 25 times per day had a mean score of 68.5 percent; and those who reported advising 30 or more times per day averaged 77.5 percent correct. These differences were not statistically significant.

TABLE 13

PHARMACISTS' CORRECT RESPONSES TO COGNITIVE TEST:
KNOWLEDGE VERSUS EXTENT OF ADVICE ON ONE-TO-ONE BASIS

Advice on 1-1 Basis	Mean Score	N	Percent	Standard Deviation
1-10/day	9.05	41	69.6	1.72
To 25/day	8.90	10	68.5	1.10
30 or more/day	10.07	14	77.5	1.27
Totals	9.25	65	71.1	1.59

$$F(2,62) = 2.58 \quad (\text{N.S.})$$

Advice on a Group Basis

Fifty-eight of the 90 pharmacists (64.4 percent) reported never advising patients about OTC's on a group basis. Four gave no response; 10 responded "seldom" to the question. Eighteen pharmacists reported offering group advice from less than once per year to once per month. The median for this group is once per year (eight respondents). It would appear that too few pharmacists are addressing themselves to advising groups about uses and misuses of nonprescription drugs.

PHARMACISTS: OPINIONNAIRE

A twenty-item opinionnaire entitled "Advising and Teaching About OTC Drugs" was completed by 98 pharmacists attending the Pharmacy Management Institute at Madison in April, 1974.²¹ The instrument was scored on a four point Likert scale arranged in descending order from four equaling "strongly agree" to one equaling "strongly disagree." Demographic variables included type of practice, tenure of practice, community size, and highest degree received. Participants also were asked to indicate their interest in participating in a one-day continuing education workshop on nonprescription drugs.

Findings: General

Only three pharmacists reported being engaged in hospital pharmacy practice. Eighty-seven reported community pharmacy practice. Therefore, the "type practice" variable did not provide for meaningful analysis.

Sixty-one of the respondents reported receiving the four-year Bachelor of Science in Pharmacy degree, and 31 received the five-year Bachelor of Science in Pharmacy degree.

Table 14 summarizes the opinions of all responding pharmacists. Statements are ranked from highest to lowest mean values. These rankings serve as indicators of the relative importance and strength of the statements as expressed by all responding pharmacists. In a later section of these analyses, rankings are reported by demographic variables; this allows for relative comparisons of rankings by different sub-groups. For purposes of these analyses, a mean value of 3.5 or greater indicates strong agreement; at least 2.5 but less than 3.5 indicates agreement; at least 1.5 but less than 2.5 indicates disagreement; and, less than 1.5 indicates strong disagreement.

Pharmacists strongly agreed with two statements concerning whether the pharmacist "should advise patients on the use of non-prescription drugs" and they strongly disagreed with one statement concerning whether the pharmacist

TABLE 14
 SUMMARY OF PHARMACISTS' OVERALL RESPONSES TO OPINIONNAIRE STATEMENTS

Statement	N	Rank	Mean	Standard Deviation	Interpretation
1. Pharmacists should advise patients on the proper use of non-prescription drugs.	97	1	3.67	.473	Strong Agreement
15. When a patron wishes to know more about an OTC drug product, he should ask a pharmacist.	97	2	3.58	.556	Strong Agreement
18. I would advise more patients about proper use of OTC's if only they would request it.	96	3	3.03	.774	Agreement
20. I would offer to teach people about uses and misuses of OTC's if I knew more about the products.	93	4	2.54	.828	Agreement
19. Pharmacists generally do not like the idea of teaching groups of people about OTC drugs.	93	5	2.34	.715	Disagreement
11. Pharmacists should train clerks to advise patients on use of OTC drugs.	95	6	2.32	.874	Disagreement

TABLE 14 (CONTINUED)
 SUMMARY OF PHARMACISTS' OVERALL RESPONSES TO OPINIONNAIRE STATEMENTS

Statement	N	Rank	Mean	Standard Deviation	Interpretation
10. Pharmacists are generally too busy to teach the public in groups about OTC drugs.	98	7	2.06	.715	Disagreement
9. Pharmacists feel incompetent when asked to teach groups of people about OTC drugs.	98	8	2.01	.681	Disagreement
13. Pharmacists lack needed communication skills to teach the public in groups about OTC drugs.	97	9	1.98	.696	Disagreement
16. When a patron wishes to know more about an OTC drug product, he should ask a drug clerk.	95	10	1.86	.715	Disagreement
17. Non-prescription drugs are generally safe enough so that patients do not need professional advice about their usage.	97	11	1.84	.874	Disagreement
8. Pharmacists lack the teaching skills needed to teach people in groups about OTC drugs.	98	12	1.82	.751	Disagreement

TABLE 14 CONTINUED)
 SUMMARY OF PHARMACISTS' OVERALL RESPONSES TO OPINIONNAIRE STATEMENTS

Statement	N	Rank	Mean	Standard Deviation	Interpretation
5. Pharmacists should only advise patients on use of those non-prescription drugs which are contraindicated by the prescription drug a patient is regularly taking.	95	13	1.80	.646	Disagreement
4. The advising of patients on selection of non-prescription drugs by a pharmacist is tantamount to diagnosing a patient's medical condition by a pharmacist.	94	14	1.76	.581	Disagreement
14. The teaching of OTC drug usage to the general public is not in the domain of professional responsibilities of pharmacists.	97	15	1.74	.650	Disagreement
2. Pharmacists should advise patients on the proper use of OTC's only after consulting with a physician.	98	16	1.65	.539	Disagreement
7. Pharmacists are not adequately informed to provide accurate information on non-prescription drugs to patients.	98	17	1.56	.517	Disagreement

TABLE 14 (CONTINUED)
 SUMMARY OF PHARMACISTS' OVERALL RESPONSES TO OPINIONNAIRE STATEMENTS

Statement	N	Rank	Mean	Standard Deviation	Interpretation
6. I am too busy to advise my patrons on the proper use of OTC drugs.	95	18	1.54	.755	Disagreement
12. Pharmacists are too busy to give needed advice to patients on prescription drugs.	97	19	1.49	.738	Strong disagreement
3. Pharmacists should not advise patients on uses of non-prescription drugs.	93	20	1.20	.402	Strong disagreement

4 = strongly agree
 3 = agree
 2 = disagree
 1 = strongly disagree

"should not advise." The pharmacists held positive opinions that: (a) they should advise patients; (b) patients should request drug advice directly from pharmacists; and (c) individually, they would advise more patients if the patients would request this service. They held negative opinions that: (a) pharmacists should not advise patients on uses of non-prescription drugs; (b) they need to advise only on OTC's that are contraindicated by prescription drugs; (c) the implication that advising is tantamount to diagnosing medical conditions; (d) advice on OTC's should only be given following physician consultation; and (e) individual pharmacists are too busy to offer their advice on OTC's. From the rankings and mean values of these statements, one could conclude that pharmacists recognize their collective responsibility to serve in a drug-advisory role for self-medicating patients.

This conclusion could be supported by the pharmacists' disagreement to statements that: (a) the teaching of drug usage to the general public is not in the domain of professional responsibilities of pharmacists; and (b) OTC's are safe enough not to warrant professional advice.

There was weak agreement with the statement, "I would offer to teach people about uses and misuses of OTC's if I knew more about the products." Pharmacists disagreed with the statement, "Pharmacists are not adequately informed to

provide accurate information on non-prescription drugs to patients." It was inferred, therefore, that pharmacists believed they possessed adequate information on OTC's, but they may not offer to teach others about uses and misuses of OTC's.

Several statements referred to pharmacists' opinions about teaching groups of people about OTC drugs. A tendency to disagree with the statement "Pharmacists generally do not like the idea of teaching groups of people about OTC's" was noted. They disagreed that pharmacists are either "too busy," "lack necessary communication skills," "lack needed teaching skills," or "feel incompetent" to teach the public in groups about OTC's. It appears that pharmacists would discuss non-prescription drugs with groups if more opportunities to do so were available.

The pharmacists held negative opinions that clerks should be advisors to self-medicating patients. This view supports the notion that OTC's do not belong in non-pharmacy retail outlets, since there is no opportunity for professional advice in these outlets.

Eight-nine of the 98 pharmacists answered "yes" to the question: "Are you interested in participating in a one-day continuing education workshop on non-prescription drugs?"

General comments were invited, but only a few pharmacists responded. Comments included: (1) "Positive programs are needed to encourage pharmacists to do this; hope I hear more;" (2) "Much more information on OTC's should be available to pharmacists; a continuing (updated) workshop should be made available;" and (3) "Pharmacists should advise at time of purchase; general public cannot be educated in groups."

In summary, pharmacists held positive opinions of their role as advisors to the self-medicating public. They felt adequately informed and competent to teach others about OTC's and did not believe that clerks should perform this function. Indications are that pharmacists would welcome continuing education programs on non-prescription drugs.

OPINIONNAIRE: ANALYSIS BY DEMOGRAPHIC VARIABLES

To achieve sample cells of approximately equal size, the tenure of practice variable was compressed into two sub-variables: practice of less than 15 years and practice of 15 or more years. This sub-division conveniently corresponds with the approximate number of years which separates the four- and five-year Bachelor of Science in Pharmacy graduates. That is, it was about 15 years ago that the minimum five-year curriculum was mandated for all

schools of pharmacy. To avoid redundancy, therefore, the "highest degree" variable was not analyzed.

The variable of community size was divided into three categories to approach equality of sample cell sizes. Table 15 shows the distribution of the sample by tenure of practice and community size. Analyses of individual opinion-statements by these two variables are found in Tables 16 through 35. For purposes of these analyses, a difference will be considered significant from a practical viewpoint only if that difference in mean scores is at least 0.5.

TABLE 15

COMPARISON OF SAMPLE BY COMMUNITY SIZE AND TENURE OF PRACTICE

Community Size	Tenure of Practice			
	Less Than 15 years		15 or more years	
	N	Percent	N	Percent
up to 9,999 Residents	16	32.7%	20	41.7%
10,000-49,999 Residents	11	22.4	11	22.9
50,000 or more Residents	22	44.9	17	35.4
Totals*	49	100.0%	48	100.0%

*one "no response."

Statement 1: "Pharmacists Should Advise Patients On
The Proper Use of Non-Prescription Drugs."

Statement 1 was uniformly ranked number one by all subgroups. No statistically significant differences were found among subgroups for either the tenure of practice or the community size variable. Pharmacists strongly agreed with Statement 1.

TABLE 16

RESPONSES TO OPINIONNAIRE STATEMENT 1: "PHARMACISTS SHOULD ADVISE PATIENTS ON THE PROPER USE OF NON-PRESCRIPTION DRUGS." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	36	22	39	50	47
Percent	7.8	22.7	40.2	51.6	48.5
Mean Score	3.69	3.68	3.64	3.72	3.62
Standard Deviation	.467	.477	.486	.454	.491
Rank	1	1	1	1	1
	F(2,94) = 0.13 (N.S.)			F(1,95) = 1.65 (N.S.)	

Statement 2: "Pharmacists Should Advise Patients On The Proper Use of OTC's Only After Consulting With A Physician."

A difference in rankings of Statement 2 by pharmacists practicing in communities of 50,000 or greater population is seen in Table 17. This sub-group also showed a higher mean value than others in the sample, but the results were not statistically significant. No statistically significant differences were found for the tenure of practice variable. Overall, the pharmacists disagreed with Statement 2.

TABLE 17

OPINIONNAIRE STATEMENT 2: "PHARMACISTS SHOULD ADVISE PATIENTS ON THE PROPER USE OF OTC'S ONLY AFTER CONSULTING WITH A PHYSICIAN." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	37	22	39	50	48
Percent	37.8	22.5	39.8	51.0	49.0
Mean Score	1.60	1.64	1.72	1.70	1.60
Standard Deviation	.498	.492	.605	.580	.494
Rank	16	15	10	16	16
	F(2,95) = 0.29 (N.S.)			F(1,96) = 0.18 (N.S.)	

Statement 3: "Pharmacists Should Not Advise Patients
On Uses of Non-Prescription Drugs."

Strong disagreement on Statement 3 was found for all respondents. Those who practice in smaller communities and those who have practiced less than 15 years were in close strong disagreement with the opinion expressed in Statement 3. There was a statistically significant difference found for the tenure of practice variable, but since the difference in mean scores between the two sub-groups is less than 0.5, the difference was not considered important. It should also be noted that respondents who practiced in largest communities showed a higher overall ranking of this Statement than others in both sub-groups.

TABLE 18

OPINIONNAIRE STATEMENT 3: "PHARMACISTS SHOULD NOT ADVISE PATIENTS ON USES OF NON-PRESCRIPTION DRUGS."
RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	36	22	39	50	47
Percent	27.1	22.7	40.2	51.6	48.5
Mean Score	1.14	1.27	1.23	1.14	1.28
Standard Deviation	.351	.456	.427	.351	.452
Rank	19	19	14	19	18
	F(2,94) = 0.92 (N.S.)			F(1,95) = 4.13 (Sig.)	

TABLE 19

OPINIONNAIRE STATEMENT 4: "THE ADVISING OF PATIENTS ON SELECTION OF NON-PRESCRIPTION DRUGS BY A PHARMACIST IS TANTAMOUNT TO DIAGNOSING A PATIENT'S MEDICAL CONDITION BY A PHARMACIST." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	36	20	38	49	45
Percent	38.3	21.3	40.4	53.1	47.9
Mean Score	1.69	1.75	1.82	1.88	1.62
Standard Deviation	.624	.550	.563	.526	.614
Rank	12	13	9	10	13
	F _(2,91) = 0.26 (N.S.)			F _(1,92) = 4.37 (Sig.)	

TABLE 20

OPINIONNAIRE STATEMENT 5: "PHARMACISTS SHOULD ONLY ADVISE PATIENTS ON THE USE OF THOSE NON-PRESCRIPTION DRUGS WHICH ARE CONTRAINDICATED BY THE PRESCRIPTION DRUG A PATIENT IS REGULARLY TAKING." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	36	21	39	49	47
Percent	37.5	21.9	41.6	51.0	49.0
Mean Score	1.78	1.81	1.85	1.76	1.87
Standard Deviation	.638	.680	.670	.662	.647
Rank	11	12	8	13	10
	F _(2,93) = 0.11 (N.S.)			F _(1,94) = 0.89 (N.S.)	

Statement 6: "I Am Too Busy To Advise My Patrons
On The Proper Use of OTC Drugs."

Mean values for all sub-groups were very close to each other for Statement 6. Uniformity of disagreement was evident. The only difference found was in the rankings, which again, was highest for pharmacists who practiced in largest communities. It can be concluded that pharmacists in this study were not too busy to offer advice to their self-medicating clients.

TABLE 21

OPINIONNAIRE STATEMENT 6: "I AM TOO BUSY TO ADVISE MY PATRONS ON THE PROPER USE OF OTC DRUGS." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	36	22	38	49	47
Percent	37.5	22.9	39.6	51.0	49.0
Mean Score	1.53	1.59	1.53	1.56	1.52
Standard Deviation	.878	.666	.687	.765	.748
Rank	18	16	12	17	15
	F _(2,93) = 0.06 (N.S.)			F _(1,94) = 0.00 (N.S.)	

Statement 7: "Pharmacists Are Not Adequately Informed To Provide Accurate Information On Non-Prescription Drugs To Patients."

TABLE 22

OPINIONNAIRE STATEMENT 7: "PHARMACISTS ARE NOT ADEQUATELY INFORMED TO PROVIDE ACCURATE INFORMATION ON NON-PRESCRIPTION DRUGS TO PATIENTS." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	37	22	39	50	48
Percent	37.8	22.5	39.8	51.0	49.0
Mean Score	1.62	1.36	1.62	1.62	1.50
Standard Deviation	.893	.492	.633	.830	.584
Rank	14	18	11	16	16
	F(2,95) = 1.37 (N.S.)			F(1,96) = 0.49 (N.S.)	

Statement 20: "I Would Offer To Teach People About Uses And Misuses Of OTC's If I Knew More About The Products."

Respondents who practiced in communities with populations of 10,000 to 49,000 residents showed strongest disagreement with Statement 7. Those who had practiced 15 or

more years also strongly disagreed with the statement. All other sub-groups disagreed with Statement 7. No statistically significant differences were found for either variable. Pharmacists who practiced in largest communities ranked Statement 7 highest among all sub-groups.

Uniformity of ranking of Statement 20 was found for all sub-groups. Pharmacists who practiced in largest communities and those with 15 or more years practice disagreed with Statement 20. All others agreed with the Statement. No statistically significant differences were found.

TABLE 23

OPINIONNAIRE STATEMENT 20: "I WOULD OFFER TO TEACH PEOPLE ABOUT USES AND MISUSES OF OTC'S IF I KNEW MORE ABOUT THE PRODUCTS." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	35	22	36	47	46
Percent	37.6	23.7	38.7	50.5	49.5
Mean Score	2.60	2.68	2.39	2.64	2.44
Standard Deviation	.736	.995	.803	.845	.807
Rank	4	4	4	4	4
	F(2,90) = 1.09 (N.S.)			F(1,91) = 2.41 (N.S.)	

Statement 8: "Pharmacists Lack The Teaching Skills Needed To Teach People In Groups About OTC Drugs."

Statement 9: "Pharmacists Feel Incompetent When Asked To Teach Groups Of People About OTC Drugs."

Statement 10: "Pharmacists Are Generally Too Busy To Teach Groups Of People About OTC Drugs."

Disagreement was found for Statements 8, 9, and 10; no statistically significant differences were found among sub-groups for either Statement. Highest mean values were found for Statements 8 and 9 among pharmacists who practiced in communities of 10,000 to 49,999 population. Those who practiced in communities of 50,000 or more showed a higher mean value for Statement 10 than other sub-groups did. Pharmacists in this group also ranked Statement 10 higher than any other sub-group.

Pharmacists who practiced in smaller communities showed lowest mean values for Statement 8 and ranked this Statement higher than all other sub-groups. This sub-group also had the lowest mean value for Statement 9.

TABLE 24

OPINIONNAIRE STATEMENT 8: "PHARMACISTS LACK THE TEACHING SKILLS NEEDED TO TEACH PEOPLE IN GROUPS ABOUT OTC DRUGS." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	37	22	39	50	48
Percent	37.8	22.5	39.8	51.0	49.0
Mean Score	1.68	2.00	1.85	1.88	1.75
Standard Deviation	.747	.690	.779	.799	.670
Rank	13	9	8	9	12
	F(1,95) = 1.31 (N.S.)			F(1,96) = 0.68 (N.S.)	

TABLE 25

OPINIONNAIRE STATEMENT 9: "PHARMACISTS FEEL INCOMPETENT WHEN ASKED TO TEACH GROUPS OF PEOPLE ABOUT OTC DRUGS." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	37	22	39	50	48
Percent	37.8	22.5	39.8	51.0	49.0
Mean Score	1.92	2.14	2.03	2.03	1.94
Standard Deviation	.795	.560	.628	.724	.633
Rank	9	8	7	7	8
	F(2,95) = 0.64 (N.S.)			F(1,96) = 0.63 (N.S.)	

TABLE 26

OPINIONNAIRE STATEMENT 10: "PHARMACISTS ARE GENERALLY TOO BUSY TO TEACH GROUPS OF PEOPLE ABOUT OTC DRUGS."
RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	37	22	39	50	48
Percent	37.8	22.5	39.8	51.0	49.0
Mean Score	2.00	1.96	2.18	2.08	2.04
Standard Deviation	.782	.576	.721	.724	.713
Rank	7	10	5	7	7
	F(2,95) = 0.76 (N.S.)			F(1,96) = 0.00 (N.S.)	

Statement 13: "Pharmacists Lack Needed Communication Skills To Teach The Public in Groups About OTC Drugs."

Statement 19: "Pharmacists Generally Do Not Like The Idea Of Teaching Groups Of People About OTC Drugs."

No statistically significant differences were found for Statements 13 and 19. Pharmacists in smallest communities had the lowest mean score for Statement 13; they ranked this Statement lower than any other subgroup. Pharmacists in all subgroups disagreed with Statement 13.

Pharmacists who practiced in communities of 10,000 to 49,999 population and those with less than 15 years tenure agreed with Statement 19. The remaining subgroups disagreed with Statement 19; disagreement was weak.

TABLE 27

OPINIONNAIRE STATEMENT 13: "PHARMACISTS LACK NEEDED COMMUNICATION SKILLS TO TEACH THE PUBLIC IN GROUPS ABOUT OTC DRUGS." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	37	22	38	49	48
Percent	38.1	22.7	39.2	50.5	49.5
Mean Score	1.78	2.23	2.21	2.02	1.94
Standard Deviation	.672	.685	.677	.692	.697
Rank	10	7	7	8	8
	F _(2,94) = 3.06 (N.S.)			F _(1,95) = 0.02 (N.S.)	

TABLE 28

OPINIONNAIRE STATEMENT 19: "PHARMACISTS GENERALLY DO NOT LIKE THE IDEA OF TEACHING GROUPS OF PEOPLE ABOUT OTC DRUGS." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	35	22	39	50	46
Percent	36.5	22.9	40.6	52.1	27.9
Mean Score	2.23	2.50	2.41	2.50	2.22
Standard Deviation	.808	.512	.715	.735	.664
Rank	6	5	3	5	6
	F(2,95) = 1.08 (N.S.)			F(1,94) = 3.47 (N.S.)	

Statement 11: "Pharmacists Should Train Clerks To Advise Patients On Use Of OTC Drugs."

Pharmacists who practiced in smallest communities and those in practice 15 or more years showed similar mean values for Statement 11. Pharmacists who practiced in smallest communities agreed with the Statement. All others disagreed. There were no statistically significant differences.

TABLE 29

OPINIONNAIRE STATEMENT 11: "PHARMACISTS SHOULD TRAIN CLERKS TO ADVISE PATIENTS ON USE OF OTC DRUGS." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	36	21	29	48	48
Percent	37.5	21.9	40.6	50.0	50.0
Mean Score	2.50	2.33	2.13	2.18	2.44
Standard Deviation	.971	.730	.833	.960	.769
Rank	5	6	6	6	5
	F(2,93) = 1.21 (N.S.)			F(1,94) = 1.84 (N.S.)	

Statement 12: "Pharmacists Are Too Busy To Give Needed Advice To Patients On Prescription Drugs."

Pharmacists who practiced in largest communities ranked Statement 12 higher than other sub-groups. They also strongly disagreed with the Statement. Pharmacists with 15 or more years practice also strongly disagreed with the Statement. All others disagreed with the Statement. There were no statistically significant differences.

TABLE 30

OPINIONNAIRE STATEMENT 12: "PHARMACISTS ARE TOO BUSY TO GIVE NEEDED ADVICE TO PATIENTS ON PRESCRIPTION DRUGS." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	37	22	38	49	48
Percent	38.1	22.7	39.2	50.5	49.5
Mean Score	1.57	1.55	1.40	1.53	1.46
Standard Deviation	.899	.800	.495	.767	.713
Rank	17	17	13	18	17
	F(2,94) = 0.62 (N.S.)			F(1,95) = 0.47 (N.S.)	

Statement 14: "The Teaching Of OTC Drug Usage To The General Public Is Not In The Domain Of Professional Responsibilities Of Pharmacists."

All Pharmacists in the sample disagreed with Statement 14. Pharmacists who practiced in largest communities and those with 15 or more years practice ranked Statement 14 higher than pharmacists in the other sub-groups. There were no statistically significant differences.

TABLE 31

OPINIONNAIRE STATEMENT 14: "THE TEACHING OF OTC DRUG USAGE TO THE GENERAL PUBLIC IS NOT IN THE DOMAIN OF PROFESSIONAL RESPONSIBILITIES OF PHARMACISTS." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	36	22	39	50	47
Percent	37.1	22.7	40.2	51.6	48.5
Mean Score	1.61	1.77	1.85	1.64	1.85
Standard Deviation	.549	.685	.709	.663	.625
Rank	15	14	8	15	11
	F(2,94) = 1.29 (N.S.)			F(1,95) = 2.34 (N.S.)	

Statement 15: "When A Patron Wishes To Know More About An OTC Drug Product, He Should Ask A Pharmacist."

Statement 16: "When A Patron Wishes To Know More About An OTC Drug Product, He Should Ask A Drug Clerk."

Pharmacists strongly agreed with Statement 15. Those who practiced in largest communities ranked this Statement Number One; all other subgroups ranked it second. No statistically significant differences were found for either variable.

Pharmacists disagreed with Statement 16. Pharmacists who practiced in smallest communities ranked the Statement higher than other sub-groups. No statistically significant differences were found for either variable.

TABLE 32

OPINIONNAIRE STATEMENT 15: "WHEN A PATRON WISHES TO KNOW MORE ABOUT AN OTC DRUG PRODUCT, HE SHOULD ASK A PHARMACIST." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	37	22	39	50	48
Percent	37.8	22.5	39.8	51.0	49.0
Mean Score	3.51	3.55	3.64	3.66	3.48
Standard Deviation	.651	.510	.486	.479	.618
Rank	2	2	1	2	2
	F _(2,95) = 0.32 (N.S.)			F _(1,96) = 1.66 (N.S.)	

TABLE 33

OPINIONNAIRE STATEMENT 17: "WHEN A PATRON WISHES TO KNOW MORE ABOUT AN OTC DRUG PRODUCT, HE SHOULD ASK A DRUG CLERK." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	35	21	39	48	47
Percent	36.8	22.1	41.1	50.5	49.5
Mean Score	2.00	1.91	1.72	1.79	1.94
Standard Deviation	.728	.700	.605	.743	.605
Rank	7	11	10	11	10
	F _(2,92) = 1.23 (N.S.)			F _(1,93) = 0.88 (N.S.)	

Statement 17: "Non-Prescription Drugs Are Generally Safe Enough So That Patients Do Not Need Professional Advice About Their Usage."

Pharmacists in all subgroups disagreed with Statement 17. There were no statistically significant differences for either variable.

TABLE 34

OPINIONNAIRE STATEMENT 17: "NON-PRESCRIPTION DRUGS ARE GENERALLY SAFE ENOUGH SO THAT PATIENTS DO NOT NEED PROFESSIONAL ADVICE ABOUT THEIR USAGE." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	37	22	39	50	48
Percent	37.8	22.5	39.8	51.0	49.0
Mean Score	1.97	1.96	1.62	1.78	1.88
Standard Deviation	.726	.653	.673	.708	.703
Rank	8	10	11	12	9
	F _(2,95) = 2.36 (N.S.)			F _(1,96) = 0.09 (N.S.)	

Statement 18: "I Would Advise More Patients About Proper Use of OTC's If Only They Would Request It."

Pharmacists agreed with Statement 18. All subgroups ranked Statement 18 very high in comparison to other statements. No statistically significant differences were found.

TABLE 35

OPINIONNAIRE STATEMENT 18: "I WOULD ADVISE MORE PATIENTS ABOUT PROPER USE OF OTC'S IF ONLY THEY WOULD REQUEST IT." RESPONSES BY THE VARIABLES: COMMUNITY SIZE AND TENURE OF PRACTICE.

	Community Size (by residents)			Tenure of Practice (by years)	
	up to 9,999	10,000- 49,999	50,000 or more	Less than 15	15 or more
N	36	22	38	49	47
Percent	37.5	22.9	39.6	51.0	49.0
Mean Score	3.03	3.05	3.03	3.14	2.92
Standard Deviation	.736	.785	.822	.764	.775
Rank	3	3	2	3	3
	F _(2,93) = 0.02 (N.S.)			F _(1,94) = 1.68 (N.S.)	

SUMMARY

Opinionnaire statements were analyzed for significant differences among three subgroups of the community size variable and two subgroups of the tenure of practice variable. Statistically significant differences were found for Statements 3 and 4 for the tenure of practice subgroups only. These differences were not judged important because of small differences between mean scores.

Pharmacists recognize their responsibility to advise patients on an individual basis. They disagreed that clerks should advise self-medicating clients. Pharmacists seemed to feel they were adequately informed and equipped with skills needed to teach the public in groups about OTC's. They also seemed to feel they were not too busy to teach the public in groups about OTC's.

Differences in rankings were noted. Pharmacists in largest communities ranked several Statements higher than the other subgroups. In general, pharmacists were positive about statements concerning their professional responsibilities with respect to OTC's. They were less positive concerning their qualifications or competencies to advise groups than they were to advise individuals on a per patient basis.

CHAPTER THREE

REFERENCES CITED

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2. See Appendix 9.
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17. Stuart, Ibid.
18. Philip D. Hansten, Drug Interactions (Philadelphia: Lea & Febiger, 1971).
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20. Stuart, Ibid., p. 2.
21. See Appendix 7.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA: NURSES

INTRODUCTION

Patients have ready access to nurses who may be asked for advice on various medications. To determine nurses' knowledge of non-prescription medications a test was administered to two groups of nurses preceding eight hours of instruction on OTC's and drug interactions.¹ Nurses were post-tested following completion of the course to assess changes in cognitive levels. Ten of 14 Questions from Part III of Pre-test were included on Post-test. In addition, the post-test contained a seven item section on prescription-nonprescription-food type interactions.²

Two groups of nurses participated in this study. One group of 44 nurses (Group I) was tested and taught in June 1973 at the University of Wisconsin - Fox Valley Center, Menasha, Wisconsin. The second group of 52 nurses (Group II) received the same treatment at the University of Wisconsin - Green Bay Center, Green Bay, Wisconsin in December 1973.

A classification of types of practice in which the nurse-participants were engaged is found in Table 36. It should be noted that nurses voluntarily enrolled for this

course. They were aware that the instructor was a pharmacist. They were not asked to answer all questions, thereby eliminating a forced choice of answers. They also were not told that a post-test would follow the instruction. Post-test questions were selected prior to teaching the course. All instruments were scored after completion of the course.

Participants were identified by social security number to enable corresponding pre- and post-tests to be correlated. A total of 96 nurses took the pre-test; 101 took the post-test.

PRESENTATION OF DATA: PRE-TEST

Part I: Medical Terminology

If one is to be able to interpret nonprescription medication product labels correctly, it is important that he be able to understand the intended use of the product. A minimum requirement, therefore, is to understand the medical terminology that may appear on the product label.

Nurses were asked to select from a multiple choice listing the most appropriate meanings for particular medical terms. Definitions were gleaned from sources such as medical dictionaries and manufacturer's catalogs.^{3,4} Results are shown in Tables 37 and 38.

TABLE 36
 CLASSIFICATION OF NURSES BY TYPE OF PRACTICE
 N = 96

PRACTICE	GROUP I		GROUP II		TOTAL	
	N	Percent	N	Percent	N	Percent
R.N., Hospital	13	29.6%	16	30.8%	29	30.2%
R.N., Nursing Home, Extended Care	7	15.9	11	21.2	18	18.8
Public Health Home Nursing Visiting Nurse	1	2.3	5	9.6	6	6.3
School Nurse, Instructor	3	6.8	4	7.7	7	7.3
Employee Health	1	2.3	-	-	1	1.0
Miscellaneous*	13	29.6	13	25.0	26	27.1
Other**	1	2.3	1	1.9	2	2.1
No Response	5	11.4	2	3.9	7	7.3
Totals***	44	100.2%	52	100.1%	96	100.1%

*Miscellaneous: Part time industrial; industrial, psychiatric mental health, head nurse, adolescent center; home nursing care; staff nurse, home nursing service, occupational health; children's health; University health service; office nurse; family practice; ORA Assistant Instructor, LPN, Nursing/ECF.

**Other: clinic nurse, inactive.

***Due to rounding.

TABLE 37

NURSES' CORRECT RESPONSES TO PART ONE OF PRE-TEST:
DEFINITIONS AND MEDICAL TERMINOLOGY

(CORRECTED FOR TOTAL N = 96)

MEDICAL TERM	CORRECT DEFINITION				TOTAL PERCENT	
	GROUP I		GROUP II			
	N	PERCENT	N	PERCENT	N	PERCENT
Analgesic	43	97.7%	51	98.1%	94	97.9%
Antacid	33	75.0	42	80.8	75	78.1
Antipyretic	36	81.8	46	88.5	82	85.4
Expectorant	42	95.5	49	94.2	91	94.8
Antitussive	37	84.1	43	82.7	80	83.3
Antipruritic	38	86.4	46	88.5	84	87.6
Laxative	43	97.7	51	98.1	94	97.9
Antidiarrheic	43	97.7	51	98.1	94	97.9
Anticoagulant	44	100.0	52	100.0	96	100.0
Diuretic	44	100.0	52	100.0	96	100.0
Antiemetic	39	88.6	47	90.4	96	88.5
Emetic	40	90.9	51	98.1	91	94.8
Hypnotic	43	97.7	46	88.5	89	92.7
Anthelmintic	24	54.5	26	50.0	50	52.1
Hematinic	40	90.9	47	90.4	87	90.6
Purgative	36	81.8	44	84.7	80	83.3
Decongestant	40	90.9	46	88.5	86	89.6
Demulcent	19	43.2	26	50.0	45	46.9
Emollient	28	63.6	40	71.2	68	70.8
Carminative	22	50.0	18	34.6	40	41.7

Nurses had the least difficulty recognizing the meanings for "Diuretic" and "Anticoagulant" and the most difficulty recognizing the meanings for "Carminative," "Anthelmintic," and "Demulcent."

TABLE 38

NUMBER OF DIFFERENT RESPONSES TO MEDICAL TERMINOLOGY
QUESTIONS GIVEN BY NURSES

Terminology	<u>Different Responses</u>		<u>No Responses</u>		<u>Different Responses</u>
	Group I	Group II	Group I	Group II	Combined Groups
Anthelmintic	9	10	7	8	11
Carminative	8	7	5	6	10
Demulcent	6	6	6	6	8
Antipruritic	5	6	2	0	8
Antitussive	4	5	4	4	7
Emollient	5	5	2	1	7
Antiemetic	3	4	3	2	6
Antipyretic	4	4	5	1	5
Purgative	5	4	0	1	5
Hypnotic	2	4	0	1	4
Emetic	4	2	0	0	4
Expectorant	3	4	0	0	4
Hematinic	2	3	3	1	3
Antacid	3	3	0	2	3
Decongestant	3	3	0	0	3
Antidiarrheic	2	1	0	0	2
Laxative	2	2	0	0	2
Analgesic	2	2	0	0	2
Anticoagulant	1	1	0	0	2
Diuretic	1	1	0	0	1

Table 37 shows that the range of scores for the 44 nurses in Group I was 43.2 percent to 100 percent correct with a mean of 83.4 percent. The range for Group II nurses was from 34.6 percent to 100 percent correct with a mean of 83.7 percent.

The number and percent of different responses are revealed in Table 38. Only two items were answered correctly by all of the nurses in both groups.

Table 39 shows that no statistically significant differences were found between the two groups on the pre-test.

TABLE 39

SUMMARY OF STATISTICAL TEST FOR PART ONE OF THE PRE-TEST: CORRECT RESPONSES FOR BOTH GROUPS OF NURSES

	NURSES		Totals
	Group I	Group II	
N	44	52	96
Percent Correct	83.4	84.0	83.8
Mean Score (Raw)	16.68	16.81	16.75
Standard Deviation	2.62	2.34	2.46
$F_{(1,94)} = 0.06$ (N.S.)			

The term "Anthelmintic" is used infrequently in everyday conversation; therefore, it was not surprising that nurses had difficulty selecting the correct meaning for this term. It was not expected that the mean scores for correct answers to "Demulcent," "Carminative," and "Emollient" were so low. These terms are heard over television

and printed on labels of popular brand name products, making them more readily accessible to the general public and to nurses.

The alternative answer given for "analgesic" was "reduces fever." This may not be surprising since analgesic-antipyretic action is found in most commonly purchased internal analgesic products. It was hoped that participants would have distinguished between the term "laxative" meaning "to promote bowel evacuation" and "purgative" meaning "a very strong product to evacuate bowels." In all but two cases, this distinction was made for "laxative." The same was not true for "purgative." As shown in Table 38, the nurses did not differentiate several of the medical terms.

Although nurses in Group II scored slightly higher than those in Group I, the differences were not statistically significant.

Part II: Products and Their Uses

Section II of the pre-test was a matching of product trade names with the technical names for their uses. It was stated that some products could have more than one use. Results appear in Tables 40 through 42.

The total possible number of correct answers was 18, although only 14 products were listed for this section of the test. Two of the products "analgesic" and "antipyretic" required two answers each. Since "expectorant" and "anti-tussive" may not have been technically distinguishable, two possible answers were accepted for each of these terms. Technical uses were listed rather than common uses because it was thought that since nurses were health professionals, they would be more familiar with medical terminology than would non-professionals. The use of medical terminology in this section instead of common terms also allowed for checking understanding of medical terms as they applied to the products listed.

Table 40 shows the correct responses to Part II of the Pre-test. It was expected that nurses would have scored better on questions relating to aspirin and Tylenol because these products are widely used in medical practice. However, only 63.5 percent correctly answered that aspirin is an analgesic; 61.5 percent also recognized that it is an antipyretic; but only 27.1 percent answered that aspirin is also an anti-inflammatory agent. This is one of the uses that distinguished aspirin from other drugs in its therapeutic class. Only 54.2 percent of the nurses answered that Tylenol is an analgesic, but, even a lower percentage

TABLE 40

NURSES' CORRECT RESPONSES TO PART TWO OF PRE-TEST:
MATCHING MEDICAL TERMINOLOGY WITH SELECTED PRODUCTS.

(TOTAL N = 96)

Use and Product	Correct Responses					
	Group I		Group II		Both Groups	
	N	Percent	N	Percent	N	Percent
Analgesic (Aspirin)	31	70.5	30	57.7	61	63.5
Analgesic (Tylenol)	21	47.7	31	59.6	52	54.2
Diuretic (Doan's Pills)	36	81.6	38	73.1	74	77.1
Antitussive (Robitussin)	21	47.7	28	53.9	49	51.0
(Vick's Form. 44)	12	27.0	21	40.4	33	34.4
Expectorant (Robitussin)	30	68.2	32	61.5	62	65.6
(Vick's Form. 44)	14	31.8	15	38.9	29	29.2
Decongestant (Neosynephrine)	32	72.7	40	76.9	72	75.0
Antipruritic (Calamine Lotion)	24	77.3	43	82.7	78	81.3
Sedative (Nervine)	31	70.5	32	61.5	63	65.7
Antidiarrheic (Kaopectate)	34	77.3	43	82.7	77	80.2
Antiinflammatory (Aspirin)	14	31.8	12	21.2	26	27.1
Anthelmintic (Jayne's P.W.)	14	31.8	16	30.3	30	31.3
Antipyretic (Aspirin)	25	56.8	34	65.4	59	61.5
(Tylenol)	15	34.1	10	19.2	25	26.0
Purgative (Castor Oil)	25	90.9	42	80.8	82	85.4
Antacid (Maalox)	25	56.8	34	65.4	59	61.5
Demulcent (Pepto-Bismol)	14	31.8	22	40.8	36	37.6

(26.0 percent) also named Tylenol as an antipyretic. The combined group of nurses responded best to matching castor oil with its use as a purgative and least well on matching Tylenol as an antipyretic. Table 41 shows the number of different responses to the product-use identification questions.

The number of different responses was relatively small, but the number of no responses was relatively large; this could indicate that the nurses were unfamiliar with the trade names of common OTC products. The question is asked: "Did nurses not know the names for medical uses or did they not recognize the names for products?" Table 42 shows a cross tabulation of definitions and products with the number and percent who knew the correct definitions of the medical uses. The Table reveals that 71.9 percent of the sample knew the name of the product which corresponded to the medical use for the term "purgative." Only 54.2 percent of those who could recognize the definition for "analgesic" correctly named "Tylenol" as the product; of those who knew the definition of "antipyretic," only 35.4 percent chose "Tylenol" as one of the products which corresponded to the definition.

TABLE 41

NUMBER OF DIFFERENT RESPONSES AND NO RESPONSES TO
PRODUCT USE IDENTIFICATION QUESTIONS: BOTH GROUPS
OF NURSES

Use & Product	No Responses		Different Responses		Combined Group Different Responses
	Grp. I	Grp. II	Grp. I	Grp. II	
Analgescic (Aspirin)	11	19	3	4	6
(Tylenol)	22	18	2	3	4
Diuretic					
(Doan's Pills)	5	9	3	4	4
Antitussive					
(Robitussin)	21	20	3	3	3
(Vick's 44)	32	31	1	1	1
Expectorant					
(Robitussin)	14	18	1	1	1
(Vick's 44)	30	37	1	1	1
Decongestant					
(Neosynephrin)	2	2	6	6	8
Antipruritic					
(Calamine Lotion)	5	2	5	5	6
Sedative (Nervine)	2	5	5	7	8
Antidiarrheic					
(Kaopectate)	2	0	4	4	6
Anti-Inflammatory					
(Aspirin)	13	13	9	11	13
Anthelmintic					
(Jayne's P.W.)	17	13	6	7	9
Antipyretic (Aspirin)	8	9	4	5	5
(Tylenol)	29	42	1	1	1
Purgative					
(Castor Oil)	1	2	2	6	6
Antacid (Maalox)	1	1	6	4	7
Demulcent (Pepto-Bismol)	12	11	8	7	10

TABLE 42

COMPARISON OF PRODUCT USE IDENTIFICATION WITH
CORRECT DEFINITION OF THAT USE

Use/Product	Knew Definition of Medical Term					
	Group I		Group II		Combined	
	N	Percent	N	Percent	N	Percent
Antipyretic (Aspirin)	25	56.8%	34	65.4%	59	61.5%
(Tylenol)	14	31.8	10	19.2	24	35.4
Analgesic (Aspirin)	30	68.2	30	57.7	60	62.5
(Tylenol)	21	47.7	31	59.6	52	54.2
Anthelmintic (Jayne's P.W.)	13	29.5	12	23.1	25	26.8
Purgative (Castor Oil)	32	72.7	37	71.2	69	71.9
Demulcent (Pepto-Bismol)	8	18.2	13	25.0	21	21.9
Antipruritic (Calamine Lotion)	31	70.5	44	86.6	75	78.1
Expectorant (Robitussin)	29	65.9	31	59.6	60	62.5
(Vick's 44)	13	31.8	13	25.0	26	27.1
Antitussive* (Robitussin)					44	45.8

*only total responses available.

Parentheses following Uses indicates correct answer for product.

Table 43 shows that nurses did not score very high on Part II of the pre-test. There were no statistically significant differences between groups.

TABLE 43

SUMMARY OF STATISTICAL TEST FOR PART TWO OF THE
PRE-TEST RESPONSES FOR BOTH GROUPS OF NURSES

	Group I	NURSES Group II	Totals
N	44	52	96
Percent Correct	55.9	56.0	55.9
Mean Score (Raw)	10.07	10.08	10.07
Standard Deviation	2.35	2.49	2.41
$F_{(1,94)} = 0.00$ (N.S.)			

Part III: Uses, Ingredients and Interactions

Section III of the pre-test consisted of 14 multiple-choice items concerned with ingredients, uses, adverse reactions and drug interactions of OTC medications.

Nurses scored very poorly on this section as indicated in Table 44.

Table 44 shows that nurses scored an average of about 5.0 correct of the 13 questions analyzed. As explained in Chapter Three, Question 2 was eliminated because of the lack

of clarity of alternative choices, and the uncertainty surrounding those choices.

TABLE 44

SUMMARY OF STATISTICAL TEST FOR PART THREE OF
PRE-TEST FOR BOTH GROUPS OF NURSES

	Group I	NURSES Group II	Totals
N	44	52	96
Percent Correct	39.9	37.1	38.4
Mean Score (Raw)	5.18	4.83	4.99
Standard Deviation	2.12	1.99	2.05
$F(1,94) = 0.71$ (N.S.)			

Nurses scored best on Question 1 which asked them to select the alternative which best indicated why concurrent administration of alcoholic beverages and barbiturates is contraindicated. A total of 79.2 percent answered the question correctly.

Question 9 asked for the reason why chronic use of sodium bicarbonate can be harmful. The correct answer was chosen by 71.9 percent of the nurses. Question 10 related to the preferred type of dosage form for a nasal decongestant

which is to be used for more than two days; 47.9 percent chose the correct answer. Question 4 dealt with adverse reactions to phenylpropanolamine; 46.9 percent of the nurses correctly answered the question. Additionally, 43.6 percent recognized one or more of the adverse reactions of this drug. Question 5 asked for the logical reason why tolbutamide and alcohol are contraindicated: 44.8 percent chose the correct answer.

For the remaining questions, the percent of nurses answering correctly was:

Question 3 (Alternative drug of choice for aspirin)

34.4 percent;

Question 6 (Use of Dextromethorphan) 29.2 percent;

Question 7 (Mechanism of action of saline cathartics)

13.5 percent;

Question 8 (Active ingredient in OTC sleep aids)

27.1 percent;

Question 11 (Adverse reactions to mineral oil) 25.0 percent;

Question 12 (Interaction of calcium-containing antacids and milk) 31.3 percent;

Question 13 (OTC drug of choice for productive coughs)

14.6 percent;

and Question 14 (Adverse reactions to aspirin) 33.3 percent.

Results supplied by these data indicate that nurses are poorly informed regarding ingredients, adverse reactions and drug interactions which involve the medications included in this test.

The overall results of the pre-test are found in Table 45.

TABLE 45
OVERALL RESULTS OF PRE-TEST SCORES FOR NURSES
(BASE = 51 QUESTIONS)

	Group I	Group II	Total
N	44	52	96
Percent Correct	62.6	62.2	62.4
Mean Score (Raw)	31.9	31.7	31.8
Standard Deviation	5.68	5.64	5.63
$F_{(1,94)} = 0.04$ (N.S.)			

Part IV: Sources of Information on OTC's; Purchase Of OTC Products; Expected Value of Course

In answer to the Question: "Where do you first hear about an over-the-counter drug product?", nurses responded as shown in Table 46.

TABLE 46

NURSES' RESPONSES TO "WHERE DO YOU FIRST HEAR ABOUT AN OVER-THE-COUNTER DRUG PRODUCT?"

Source	Responses of Combined Groups	
	N	Percent
Television Commercial	51	53.1%
TV & Newspaper/Magazine	12	12.5
Newspaper/Magazine	7	7.3
Neighbor, Friend/Family	9	9.4
Pharmacist	4	4.2
Other*	7	7.3

*Other refers to multiple answers.
Six persons did not respond to the question.

These data show that nurses were most often introduced to nonprescription medication via television commercials. These data correspond to those reported in the Braren study and by National Analysts, Incorporated.^{5,6}

In answer to the question: "Do you ever purchase over-the-counter products for yourself or for a member of the family?", 88.5 percent answered "Yes" and 3.1 percent answered "No"; 8.3 percent did not respond.

Since nonprescription medications are available from many sources--some of which offer no possibility of professional monitoring or control--and, since studies show that females purchase OTC's more frequently than males⁷ (only one nurse in Group II is male), the nurses were asked: "Where do you purchase your products for self-medication?" Responses are found in Table 47.

TABLE 47

SOURCES OF PURCHASE OF OTC MEDICATIONS AS REPORTED BY NURSES

Source	Responses of Combined Groups	
	N	Percent
Neighborhood Pharmacy	46	51.1%
Chain Drugstore	15	16.7
Discount Store	3	3.3
Supermarket	2	2.2
Grocery/Supermarket/Discount	3	3.3
Chain Store/Discount	3	3.3
Pharmacy/Discount/Grocery	5	5.6
Pharmacy/Chain Store/Supermarket	11	12.2
"Other"	2	2.2
Total	90	99.9*

*Due to Rounding.

Six persons did not respond to the question.

As shown in the preceding table, a majority of nurses reported purchasing OTC's at their neighborhood pharmacy or chain drugstore. It would appear that nurses would have ample opportunity to ask questions of their pharmacists whenever they felt a need for information on OTC's. Indications from the pre-test are that nurses could benefit from such discussions with pharmacists.

When asked: "When you wish to know more about a product, to whom or where do you go for additional information?", four nurses named "your doctor," 38 said "your pharmacist;" one answered "a friend;" and the remaining respondents gave a combination of answers such as: "Pharmacist/doctor/PDR/clinic and Other Printed Material.

The above responses indicate that nurses relied on pharmacists more often than on any other single source for information on OTC's. There was also a tendency to consult physicians or to read the information for themselves. Although the Physicians Desk Reference was cited as a source, it should be noted that this reference, with few exceptions, concentrates primarily on prescription medications. It can be of value in describing contraindications and known interactions of prescription drugs with OTC's.

It also is worth noting that the participants had full awareness that the researcher was a pharmacist. This fact

may have biased their answers in favor of pharmacy and pharmacists.

Of the products listed in Part IV of the pre-test, all but "tonics" were checked at least once by at least one nurse. This means that nurses reported purchasing one or more of each type product listed. The frequency ranged from once per week for "fever reducers," "laxatives," "vitamins," and "antihistamines" to once per year for many of the remaining type products.⁸

Nurses expressed various expectations of the value of the course "Uses and Misuses of Over-the-Counter Drugs." For example, many expected to use the material in their everyday work situations, in advising patients (especially those in nursing homes and extended care facilities), and in personal situations involving family and friends.⁹

PRESENTATION OF DATA: POST-TEST

Part I: Selected Questions From Pre-Test

The first section of the post-test consisted of 10 multiple-choice items selected at random and rearranged in order of appearance from Section III of the pre-test. A summary of results appears in Table 48.

TABLE 48

NURSES' CORRECT RESPONSES TO POST-TEST QUESTIONS,
PART ONE*

	Group I	Group II	Total
N	52	49	101
Percent Correct	77.1	78.9	77.9
Mean Raw Score	6.92	7.10	7.01
Standard Deviation	1.64	1.20	1.44

$$F(1,99) = 0.39 \text{ (N.S.)}$$

*Based on 9 questions.

The post-test was administered immediately following the course of instruction. As happened in the pre-test, one question was thrown out--Question 10 which corresponded to Question 2 of the pre-test. Results shown in Table 48 indicate that nurses had much higher mean scores on this section of the post-test than they did on a similar section of the pre-test. It was necessary to use percentage figures to compute mean differences in scores, since the number of items differed in the two sections of the pre- and post-tests which are considered here. Table 49 shows a comparison of pre- and post-test scores for this section.

TABLE 49

COMPARISON OF PART III PRE-TEST CORRECT RESPONSES
WITH PART I POST-TEST RESPONSES FOR NURSES

Question	Pre-test	Post-test
	Percent Correct (N=96)	Percent Correct (N=101)
1.	79.2%	+
3.	34.4	+
4.	46.9	63.4%
5.	44.8	96.0
6.	29.2	70.3
7.	13.5	85.2
8.	27.1	+
9.	71.9	76.2
10.	47.9	95.1
11.	25.0	+
12.	31.3	80.2
13.	14.6	51.5
14.	33.3	83.2
Mean	38.4	77.9

+Not included in post-test.

The nurses showed an average gain of 39.5 percentage points from pre-test to post-test; this mean score of 77.9 percent is more than double that scored in pre-test. The conclusion can be made that nurses showed a definite gain in knowledge following instruction in uses and misuses of nonprescription drugs.

Part II: Drug Interactions

Section II of the post-test asked nurses to list one drug interaction for each of seven drugs or pharmacologic classifications of drugs. Interactions of OTC's with prescription drugs or with foods were accepted.

For the "analgesic interaction" question, a majority of nurses listed aspirin-anticoagulant (coumadin, coumarin) interaction as a prototype of a drug interaction involving an analgesic. Others listed included: aspirin-tolbutamide, aspirin-alcohol, aspirin leading to hemorrhage or allergy, and implications of aspirin in increased fluid retention due to increase in sodium intake. All of these answers were accepted, but the preferred answer was the aspirin-anticoagulant interaction. Ninety-six nurses answered this question.

For the "laxative interaction" question, the majority listed the implication of mineral oil in interference with absorption of fat-soluble vitamins. The second most popular

answer was related to implications of saline-type cathartics and sodium retention and the consequent effects of heart patients, and hypertensives. Both answers were accepted. Other answers included (1) a possible interaction of diuretics, and (2) the harshness of castor oil for patients on special diets for bowel diseases and gastric distress. Eighty-five nurses answered this question.

A majority of nurses names antacid-tetracycline interaction as a prototype of an "antacid interaction" question;" some named specific antacids. These answers were accepted. About one-third of the answers could not be accepted, since respondents merely named aspirin-analgesic compounds as possibilities; many seemed to guess at appropriate answers for this question.

Nurses named alcohol as a substance which would interact with antihistamine for the "antihistamine interaction" question. Some listed alcohol and various cold preparations, and nearly all indicated that the results of taking these combinations would be increased central nervous system depression. These answers were accepted. Eighty-two nurses responded to this question.

Orinase, tolbutamide, Valium and Librium were named as preparations which would interact with alcohol for the

"alcohol interaction" question. Coumadin was listed by a small number of nurses. Ninety-five nurses responded to this question.

The majority of nurses listed monoamine oxidase inhibitors or Parnate as a type preparation which would interact with cheese for the "cheese interaction" question. Others listed tetracycline and cheese as interactors. Eighty-nine nurses answered this question.

Hypertension medications, alcohol, sedatives, tranquilizers and combinations of cold medications were listed as possible preparations which may interact with decongestants.

Overall, nurses answered these open-ended questions satisfactorily. They did best on the analgesic, cheese, and alcohol interaction questions.

From nurses' performance on both sections of the post-test, it can be concluded that the course accomplished the objectives outlined in Chapter Two.

POST-HOC EVALUATION STATEMENTS

Nurses were invited to submit statements regarding their impressions of the course "Uses and Misuses of Over-the-Counter Drugs" to the convener of the course within two months following completion of the course. Comments on the

usefulness of the course to nurses were invited. Fifty-seven statements were forwarded by the convener to the instructor of the course.¹⁰

Nurses expressed general satisfaction with the course. They expressed particular interest in the emphasis on drug interactions. Excerpts from their comments are included in this section.¹¹

Application to Nurses' Practice

One nurse wrote: "I found the course most helpful both in my position as a charge nurse and as a homemaker. In a small hospital in a small community I've found that the doctors seem to leave a lot of responsibility to the charge nurses and medical nurses, particularly in dealing with medications--allergic reactions and interactions. . . . I have also found many opportunities to educate patients who inquire about aspirins etc. they see advertised on television . . ."

Another wrote: "The information . . . will be a useful guide in the administering of medicines in the light of drug reaction and in the education of new admissions who usually bring a score of home remedies in with them."

Other comments included: (1) "My work in Home Nursing Program involves patient contact in the home setting. I found the information . . . applicable and helpful in situations often encountered." (2) I was able to convince an

outpatient who had been refusing to take aspirin for frequent headaches (sinus related) that acetaminophen 325 mg. would relieve his headache without upsetting his stomach . . . ;" (3) "I have had several discussions with our pharmacist about various combinations of drugs prescribed. As a result he has been able to make some helpful suggestions . . . ;" (4) "The impact of advertising of over-the-counter drugs makes me wonder if something shouldn't be done about advertising drugs on television because of harmful use as was done with cigarettes;" (5) "This last month I had developed an independent study packet which includes a sub-unit in which students will lead a seminar on non-prescription drugs . . . ;" (6) ". . . I feel I gained much worthwhile knowledge beneficial to myself and of utmost importance beneficial to my patients;" (7) "I have found the material and information very useful in my work in community nursing . . . ;" (8) "The possibilities for teaching involved in this drug seminar were endless . . . ;" (9) "I do not feel the workshop was worth the nine dollar fee. It seemed poorly organized;" (10) "The workshop proved to be extremely interesting but only an introduction to a broad field;" and (11) After having attended this workshop, I am able to advise patients, family and friends to use over-the-counter drugs more wisely"

Only about four nurses expressed negative opinions of the course. The overwhelming majority found the course to be helpful in creating awareness of nonprescription drugs with respect to their adverse reactions and possible interactions. Many expressed appreciation for learning about alternatives for OTC's which may be implicated in serious side effects and drug interactions. Several indicated specific examples of how they had used the information learned from the course to help patients and family.

CHAPTER 4

REFERENCES CITED

1. See Appendices 1 and 3.
2. See Appendices 2 and 4.
3. Pharmacist's Reference, (Indianapolis: Eli Lilly and Company, 1962).
4. Harold Wellington Jones, Normand L. Hoerr, and Arthur Osol, eds. Blakiston's New Gould Medical Dictionary, 1st ed., (Philadelphia: The Blakiston Company), 1951.
5. Appendix A, Selected Tables From the FDA-Sponsored Study: A National Opinion Survey With Respect To Informative Food Labeling, Poisonous Prevention Packaging, and Drug Labeling, (Mimeographed).
6. National Analysts, Incorporated, A Study of Health Practices And Opinions (Springfield, Va.: National Technical Information Service, Department of Commerce, 1972).
7. Ibid.
8. See Appendix 10.
9. See Appendix 11.
10. See Appendices 13 and 14.
11. Full statements can be found in Appendices 13 and 14.

CHAPTER FIVE

COMPARISON OF PHARMACISTS' AND NURSES' PERFORMANCE
ON COGNITIVE TESTINTRODUCTION

Pharmacists were administered Part III of the same cognitive test given to the nurses who participated in this study. A one-way analysis of variance test revealed no statistically significant differences between the two groups of nurses. It was convenient, therefore, to combine scores of the two groups of nurses.

Nine of the questions posed in Part III of the pre-test were used in Part I of the post-test. Figure 2 shows pre- and post-test results for the nurses and compares them with results for an equivalent test given to pharmacists. Data comparing test results by individual questions and by groups are presented in this chapter. The t-test was used to identify statistically significant differences between nurses as a combined group and pharmacists' mean percent correct scores on each question. The change in significant differences following completion of the post-test also was computed by use of the t-test. Results for individual questions appear in Tables 50 through 62.

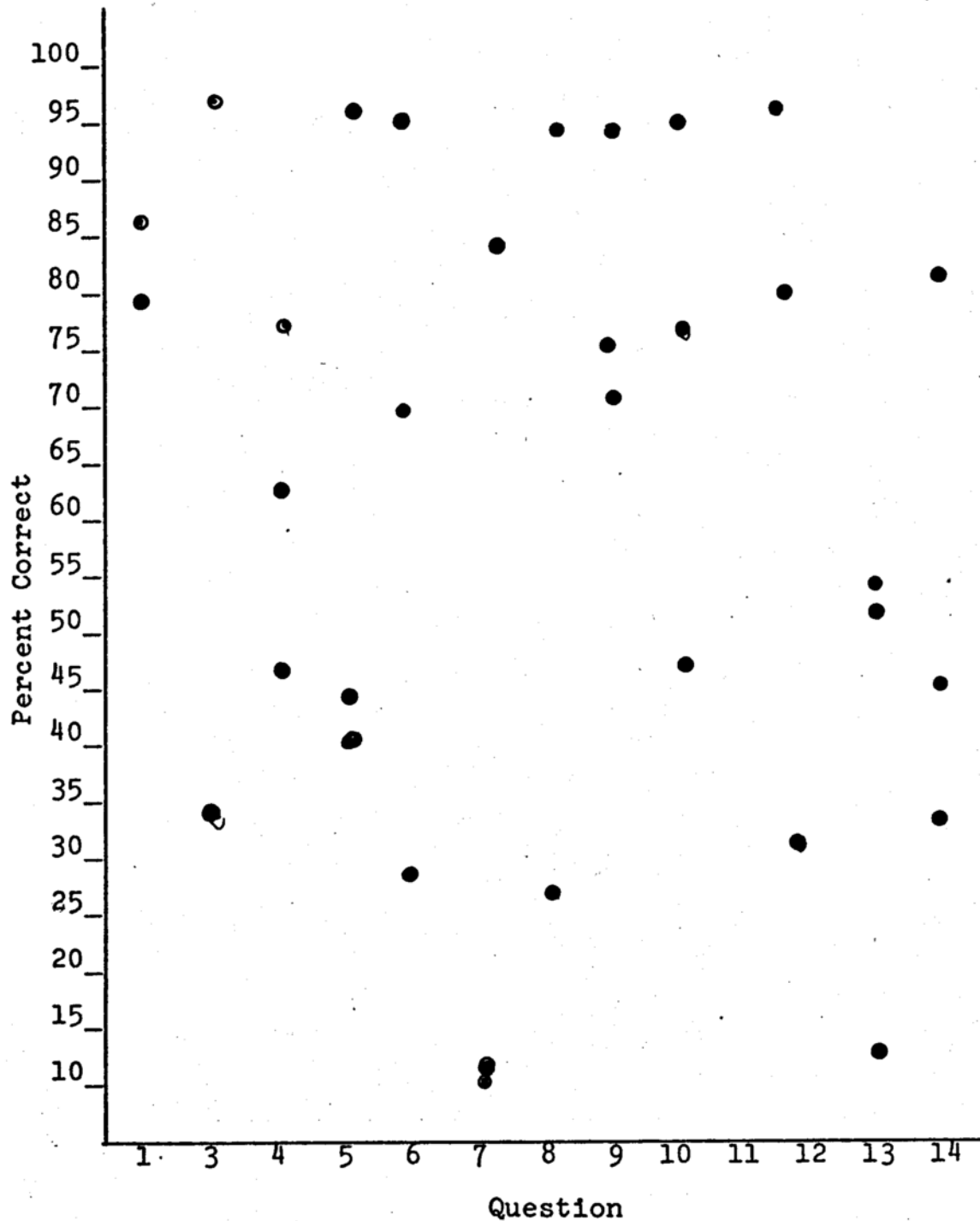


Figure 2. Graph Comparing Nurses' and Pharmacists' Percent Correct Scores On Cognitive Test

Legend: Red = Nurses' Pre-test
 Green = Pharmacists
 Blue = Nurses' Post-test

COMPARISON OF NURSES' AND PHARMACISTS' TEST RESULTS
BY INDIVIDUAL QUESTIONS

Question 1: Rationale For Contraindicating The Con-
Current Use of Alcoholic Beverages and Barbiturates

Question 1 was used in the pre-test for nurses and in the cognitive test for pharmacists, but was not included in the post-test. Table 50 shows that 86.7 percent of the pharmacists and 79.2 percent of the nurses answered correctly that "central nervous system depressant action is potentiated" when alcoholic beverages and barbiturates are taken together. The difference in these scores was not statistically significant.

TABLE 50

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO QUESTION ONE OF COGNITIVE TEST: "ALCOHOLIC BEVERAGES WOULD BE CONTRAINDICATED IN PATIENTS RECEIVING BARBITURATES BECAUSE. . ."

Nurses' Pre-test (N = 96)		Pharmacists (N = 90)	
N	Percent	N	Percent
76	79.2%	78	86.7%
$t = 1.354$ (N.S.)			

Question 3: Alternative Analgesic-Antipyretic Drug
Of Choice To Aspirin

Pharmacists scored significantly higher than nurses on Question 3 as seen in Table 51. A total of 97.8 percent of the pharmacists and 34.4 percent of the nurses correctly chose "acetaminophen" in answer to the question. A closer examination of nurses' responses revealed that 30.2 percent chose "phenacetin" as the correct answer; 8.3 percent selected "acetanilid;" and, 16.7 percent chose "antipyrine." It was evident that nurses had insufficient knowledge of analgesics in the para-aminophenol group. It was noted that nurses also failed to recognize the use of Tylenol, a brand name for acetaminophen, as an analgesic-antipyretic drug. (Part II of Pre-test, Chapter Four). The other drugs of the para-aminophenol group of analgesics are used infrequently for both self-medicators and prescription-users.

Question 4: Adverse Reactions To Phenylpropanolamine

Table 52 shows that 97.8 percent of the pharmacists and 26.9 percent of the nurses on the pre-test correctly answered Question 4. A total of 63.4 percent of the nurses correctly answered this question on the post-test. Pharmacists scored significantly higher than both groups of nurses.

Nurses gained 16.8 percentage points following completion of the course, but this gain was insufficient to

TABLE 51

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO QUESTION THREE OF COGNITIVE TEST: "INDIVIDUALS, ESPECIALLY THOSE WITH PEPTIC ULCERS, OR THOSE TAKING CERTAIN PRESCRIPTION DRUGS, SHOULD AVOID ASPIRIN-TYPE PAIN RELIEVERS. ONE ALTERNATIVE DRUG WHICH LACKS THE SIDE EFFECTS OF ASPIRIN BUT IS AN EFFECTIVE ANALGESIC ANTI-PYRETIC IS . . ."

<u>Nurses' Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)	
N	Percent	N	Percent
33	34.4%	88	97.8%
$t = 9.065$ (Sig.)			

TABLE 52

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO QUESTION FOUR OF COGNITIVE TEST: "CONTACT^R AND SIMILAR COLD-HAYFEVER PRODUCTS CONTAIN DRUGS SUCH AS PHENYLPROPANOLAMINE HCL, A SYMPATHOMIMETIC DRUG. THIS DRUG MAY . . ."

<u>Nurses' Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)		<u>Nurses' Post-test</u> (N = 101)	
N	Percent	N	Percent	N	Percent
45	46.9%	88	97.8%	64	63.4%
Nurses' Pre-test vs Pharmacists: $t = 4.335$ (Sig.)					
Nurses' Post-test vs Pharmacists: $t = 2.172$ (Sig.)					

erase the wider gap of over 50 percentage points which occurred between nurses on the pre-test and pharmacists.

Question 5: Rationale For Contraindicating Concurrent Administration of Tolbutamide and Alcohol

Neither pharmacists nor nurses on the pre-test scored very well on Question 5. As shown in Table 53, the nurses' mean percent correct on the pre-test was 3.8 percentage points better than the mean score for pharmacists, but this was not statistically significant. Nurses improved by 51.2 percentage points on the post-test. This score was significantly higher than the pharmacists' scores.

The correct answer to Question 5 is: "Alcohol and tolbutamide competitively inhibit each other's metabolism." It was interesting to note that 39.6 percent of the nurses and 54.4 percent of the pharmacists chose the answer "Alcohol increases the rate of metabolism of tolbutamide"--a direct contradiction of the correct answer. Nurses' post-test scores showed that they definitely gained in knowledge on Question 5 as evidenced by the mean score of 96.0 percent correct. The low mean score for pharmacists indicates that they need to study the mechanism of action and biopharmaceutics of tolbutamide and similar drugs.

TABLE 53

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO QUESTION FIVE OF COGNITIVE TEST: "CONCURRENT ADMINISTRATION OF TOLBUTAMIDE (ORINASE^R) AND ALCOHOL IS CONTRA-INDICATED. ONE MOST LOGICAL REASON FOR THIS IS . . ."

<u>Nurses' Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)		<u>Nurses' Post-test</u> (N = 101)	
N	Percent	N	Percent	N	Percent
43	44.8%	37	41.1%	97	96.0%
Nurses' Pre-test vs Pharmacists: $t = -0.507$ (N.S.) Nurses' Post-test vs Pharmacists: $t = -8.278$ (Sig.)					

Question 6: Use of Dextromethorphan

Most pharmacists correctly answered that dextromethorphan is widely used as a "cough reflex suppressant." On the pre-test, only 29.2 percent of the nurses correctly answered Question 6. These results were statistically significant. Although nurses gained 41.1 percentage points between the pre- and post-test, the gain was not sufficient to erase the significant difference found between pharmacists and nurses on the pre-test.

TABLE 54

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO
QUESTION SIX OF COGNITIVE TEST: "DEXTROMETHORPHAN
IS WIDELY USED AS A . . ."

<u>Nurses' Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)		<u>Nurses' Post-test</u> (N = 101)	
N	Percent	N	Percent	N	Percent
28	29.2%	87	96.7%	71	70.3%
Nurses' Pre-test vs Pharmacists: $t = 9.470$ (Sig.) Nurses' Post-test vs Pharmacists: $t = 4.824$ (Sig.)					

Question 7: Mechanism Of Action Of Saline Cathartics

Only 13.5 percent of nurses on the pre-test and 12.2 percent of the pharmacists correctly answered that saline cathartics exert their action by "increasing volume of water retained in small intestines and mechanically stimulating purgation." There was no statistically significant difference. Following instruction, nurses gained 71.6 percentage points on Question 7 and this score was significantly higher than the pharmacists' scores.

TABLE 55

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO
QUESTION SEVEN OF COGNITIVE TEST: "SALINE CATHAR-
TICS (LAXATIVES) EXERT THEIR ACTION BY . . ."

<u>Nurses' Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)		<u>Nurses' Post-test</u> (N = 101)	
N	Percent	N	Percent	N	Percent
13	13.5%	11	12.2%	86	85.2%

Nurses' Pre-test vs Pharmacists: $t = -0.264$ (N.S.)
Nurses' Post-test vs Pharmacists: $t = -10.073$ (Sig.)

Question 8: Active Ingredient In OTC Sleep Aids

Only 27.1 percent of the nurses knew that most over-the-counter sleep aids contain an "antihistamine" as their active ingredient. Table 56 shows that 95.6 percent of the pharmacists correctly answered Question 8. This difference was significant. This question was not included on the nurses' post-test.

Question 9: Harmful Results Of Chronic Use Of Sodium Bicarbonate

Table 57 shows that 71.9 percent of the nurses on the pre-test and 94.4 percent of the pharmacists correctly answered Question 9. Nurses averaged 76.2 percent correct on the post-test. Statistically significant differences were

TABLE 56

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO QUESTION EIGHT OF COGNITIVE TEST: "MANY OVER-THE-COUNTER 'SLEEP AIDS' CONTAIN, AS THEIR ACTIVE INGREDIENT, AN . . ."

<u>Nurses's Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)	
N	Percent	N	Percent
26	27.1%	86	95.6%
$t = 9.538$ (Sig.)			

TABLE 57

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO QUESTION NINE OF COGNITIVE TEST: "SODIUM BICARBONATE CAN BE HARMFUL IF USED CHRONICALLY BECAUSE IT . . ."

<u>Nurses' Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)		<u>Nurses' Post-test</u> (N = 101)	
N	Percent	N	Percent	N	Percent
69	71.9%	85	94.4%	77	76.2%
Nurses' Pre-test vs Pharmacists: $t = 4.062$ (Sig.) Nurses' Post-test vs Pharmacists: $t = 3.497$ (Sig.)					

were found between pharmacists and nurses for both the pre-test and the post-test.

Question 10: Preferred Dosage Form For Longer Use Of Decongestants

Table 58 shows that 77.8 percent of the pharmacists and 47.9 percent of the pre-test nurses correctly chose "a capsule, tablet or liquid taken orally" as the answer to Question 10. The pharmacists scored significantly better than the nurses on the pre-test. Nurses gained 47.1 percentage points on the post-test, which resulted in the nurses scoring significantly better than the pharmacists.

TABLE 58

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO QUESTION TEN OF COGNITIVE TEST: "WHEN IT IS NECESSARY TO USE A 'NASAL DECONGESTANT' FOR MORE THAN TWO DAYS, THE PREFERRED DOSAGE FORM IS . . ."

<u>Nurses' Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)		<u>Nurses' Post-test</u> (N = 101)	
N	Percent	N	Percent	N	Percent
46	47.9%	70	77.8%	96	95.1%
Nurses' Pre-test vs Pharmacists: $t = 4.207$ (Sig.) Nurses' Post-test vs Pharmacists: $t = -3.517$ (Sig.)					

Question 11: Adverse Reactions To Mineral Oil:

Only 25.0 percent of the nurses on pre-test and 56.7 percent of the pharmacists correctly answered that mineral oil "can cause lipid pneumonia." The difference in the scores was statistically significant. The remaining subjects in both samples answered as follows: 11.5 percent of the nurses and 6.7 percent of the pharmacists selected "Mineral oil is a bulk-forming laxative"; 19.8 percent of the nurses and 16.7 percent of the pharmacists said it "is a stimulant laxative"; and 29.2 percent of the nurses and 12.2 percent of the pharmacists said "it increases gastric emptying time." This question was not included in the post-test.

TABLE 59

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO QUESTION ELEVEN OF COGNITIVE TEST: "MINERAL OIL . . ."

<u>Nurses' Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)	
N	Percent	N	Percent
24	25.0%	51	56.7%
$t = 4.405$ (Sig.)			

Question 12: Interaction of Antacids, Milk And Tetracycline

The pharmacists' mean percent correct scores were significantly higher than the nurses mean percent correct scores on the pre-test and the post-test for Question 12. The correct answer is antacids "can interfere with absorption of tetracycline," and 96.7 percent of the pharmacists answered correctly. Only 31.3 percent of nurses correctly answered this question on the pre-test, but they gained 48.9 percentage points on the post-test.

TABLE 60

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO QUESTION TWELVE OF COGNITIVE TEST: "ANTACIDS, ESPECIALLY CALCIUM-CONTAINING ANTACIDS, AND MILK. . ."

<u>Nurses' Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)		<u>Nurses' Post-test</u> (N = 101)	
N	Percent	N	Percent	N	Percent
30	31.3%	87	96.7%	81	80.2%

Nurses' Pre-test vs Pharmacists: $t = 9.227$ (Sig.)
 Nurses' Post-test vs Pharmacists: $t = 3.508$ (Sig.)

Question 13: Drug Of Choice For Productive Coughs

Table 61 shows that 14.6 percent of the nurses on the pre-test correctly answered that the drug of choice for alleviating productive coughs is "ammonium chloride." For pharmacists, 55.6 percent correctly chose this answer for Question 13. This difference in scores was significant. A large percentage of nurses on the pre-test and pharmacists chose "codeine" as the correct answer. Nurses gained 39.9 percentage points on the post-test, and their score was not significantly different from the pharmacists.

TABLE 61

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO QUESTION THIRTEEN OF COGNITIVE TEST: "OF THE DRUGS LISTED BELOW, THE ONE OF CHOICE FOR ALLEVIATING PRODUCTIVE COUGHS IS . . ."

<u>Nurses' Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)		<u>Nurses' Post-test</u> (N = 101)	
N	Percent	N	Percent	N	Percent
14	14.6%	50	55.7%	52	51.5%
Nurses' Pre-test vs Pharmacists: $t = 5.866$ (Sig.) Nurses' Post-test vs Pharmacists: $t = 0.567$ (N.S.)					

Question 14: Adverse Reactions To Aspirin

A total of 46.7 percent of the pharmacists and 33.3 percent of the nurses on the pre-test correctly answered Question 14. The difference between the two scores was not statistically significant. Nurses gained 49.8 percentage points on the post-test. This mean score of 83.2 percent was significantly higher than the mean score for pharmacists.

TABLE 62

CORRECT RESPONSES OF PHARMACISTS AND NURSES TO QUESTION FOURTEEN OF COGNITIVE TEST: "VERY LARGE DOSES OF ASPIRIN, ALONE OR IN COMBINATION, CAN. . ."

<u>Nurses' Pre-test</u> (N = 96)		<u>Pharmacists</u> (N = 90)		<u>Nurses' Post-test</u> (N = 101)	
N	Percent	N	Percent	N	Percent
32	33.3%	42	46.7%	84	83.2%

Nurses' Pre-test vs Pharmacists: $t = 1.866$ (N.S.)
 Nurses' Post-test vs. Pharmacists: $t = -5.316$ (Sig.)

STATISTICAL COMPARISON OF NURSES' PRE-TEST AND
PHARMACISTS' OVERALL SCORES

A one way analysis of variance test was conducted for pharmacists versus Group I nurses and Group II nurses' pre-test scores. The results yielded a statistically significant difference with the pharmacists scoring higher than either of the two groups of nurses. These results are shown in Table 63.

TABLE 63

SUMMARY OF ANALYSIS OF VARIANCE COMPARING PHARMACISTS
WITH NURSES ON THE PRE-TEST

	Group I	Group II	Pharmacists
N	44	52	90
Percent Correct	39.9%	37.1%	72.0%
Mean Raw Score	5.18	4.83	9.36
Standard Deviation	2.13	1.99	1.58
$F_{(2,183)} = 106.06$ (Sig.)			

Group I nurses refers to those nurses who participated in the study in June 1973; Group II refers to those who participated in December, 1973. The groups were combined

for purposes of analysis of individual questions, since it was determined that no statistical differences existed between the two groups.

SUMMARY

A comparison of pharmacists mean percent correct scores with those for nurses on pre-test and on post-test revealed that pharmacists performed significantly better than either group of nurses on Questions 4, 6, 9, and 12. Pharmacists performed significantly better than pre-test nurses on Questions 3, 8, 10, 11 and 13. No statistically significant differences were found for Questions 1, 5, 7, and 14 between pharmacists and nurses on the pre-test. Nurses scored significantly better on the post-test for Questions 5, 7, 10, and 14. An overall improvement in mean percent correct scores for nurses on post-test was shown.

CHAPTER SIX
SUMMARY AND RECOMMENDATIONS

SUMMARY

Pharmacists face a dual challenge of achieving and maintaining a status which will be professionally rewarding to them and beneficial to the publics they serve. Consumers face a dilemma in which they may often experience confusion with respect to the pharmacy as a business and pharmacy as a profession. Media advertising of nonprescription medications to the public can falsely lead consumers to believe in the absolute safety and efficacy of nonprescription drugs and can diminish their felt needs for professional advice.

As professional drug information specialists, pharmacists can provide consultative services to prescribers of prescription and non-prescription drugs. They also can advise self-diagnosers on their selection and utilization of non-prescription drugs. When consumers feel a need for advice or other drug therapy, nurses may often be in unique positions to provide this advice to consumers.

Several questions arise. (a) Does the area of non-prescription medication constitute professional practice for pharmacists? (b) If so, what is their role and how are

they performing it? (c) Are other health professionals, especially nurses, equipped to function as non-prescription medication advisors? (d) Does the public want and need knowledge and understanding of over-the-counter medications? and (e) To whom or where does the consumer turn for advice on these medications; are present sources adequate, accurate, and reliable?

It appears that the medical profession does not hold a uniform view of the appropriateness of a therapeutic consultant role for pharmacists. They seem to approach more uniformity regarding pharmacists serving as advisors on non-prescription medication. By virtue of pharmacists' educational background and accessibility to the public, it would appear that they qualify as drug advisors for symptomatic illness before patients consult physicians. Utilization of pharmacists as OTC drug advisors may depend upon the attitudes they hold and communicate to others about their professional responsibility. Organized pharmacy takes a positive position regarding pharmacists' involvement in OTC drug advising.

It would appear that although pharmacists have a definite responsibility to advise patients on self-medication, they may vary in their performance of this function. Some are not performing in a desirable or acceptable manner. It

has been stated that pharmacists have a legal responsibility to give appropriate warnings about the medication products they recommend or sell. They should make certain that employees do not give advice that only a pharmacist is qualified to give.

Nurses administer medications in a variety of institutional environments. It is, therefore, likely that patients and their families ask nurses questions about medications. One noted physician encouraged the pharmacist, nurse and others to instruct the public on the usefulness of medication, while, at the same time encouraging the public to seek professional care if self-medication appears to be unwise. Observing that the widespread use of prescription and non-prescription drugs often cause drug-induced disease, disability or death, a physician has encouraged physicians, nurses and pharmacists to cooperate in reducing the incidence of drug-induced disease and misuse of all drugs.

Studies show that the public needs professional advice on the use of self-medication products. Consumers use the advertising media more often than any other source for information on OTC products. It has been stated that it is difficult for consumers to make intelligent and discriminating choices for self-medication because of unique and competitive advertising. Some consumers ask pharmacists and nurses for information on self-medication products.

The question was asked: "Are nurses really qualified to answer patients' queries about OTC's?" It seemed appropriate to examine pharmacists' knowledge and opinions regarding nonprescription drug advising, and nurses' knowledge and potential use of information on OTC's.

This study was undertaken to assess the effectiveness of in-service education on nonprescription medication offered to nurses by a pharmacist-educator. It sought to determine nurses' knowledge of nonprescription medications and the practical value of this knowledge in their nursing practice. It also was intended to determine pharmacists' knowledge of selected nonprescription medications and their opinions and practices relating to their advisor-teacher role. It was hoped that this study would ultimately benefit laymen if nurses and pharmacists became motivated to use any knowledge gained to effect and enhance efforts to teach and advise laymen on proper use of nonprescription medication.

For nurses, the objectives of the study were to: (1) increase awareness that all drugs can be misused and thereby encourage them to observe precautions when using, administering, or advising about drugs, especially nonprescription drugs; (2) encourage them as health professionals and consumers to utilize pharmacists for nonprescription medication

information; (3) measure their current levels of knowledge about selected nonprescription medications and drug interactions, and to assess cognitive changes following participation in an in-service course on OTC medications; (4) determine their current practices with respect to purchasing and learning about OTC medications; and (5) determine the practical value of an in-service course on nonprescription medications for nursing practice.

For pharmacists, the objectives were to: (1) assess their willingness to engage in the teacher-advisor role with respect to nonprescription medications; (2) raise their levels of conscious effort to offer professional advice on nonprescription medications to non-pharmacists on an individual and a group basis; (3) determine their current practices with respect to advising on nonprescription medications; (4) determine their expressed needs for and interests in continuing education on nonprescription medications; (5) determine their quick recall of selected knowledge on nonprescription medications; and (6) determine their opinions on the carrying out of professional responsibilities to teach and advise on nonprescription medications.

Two different groups of nurses participated in the study. A six month interval separated the testing and teaching of the 44 nurses in Group I and the 52 nurses in

Group II. A four part pre-test was administered to nurses. It consisted of a 20 item matching section on definitions of medical terminology used on drug labels (Part I); an 18 item matching section on medical uses and OTC products (Part II); a 14 item multiple choice section on ingredients, adverse reactions, mechanisms of action and drug interactions (Part III); and a section asking for information on purchasing sources, types of medications used, and expected value of the course (Part IV). Following administration of the pre-test, nurses were given an eight hour course of instruction entitled "Uses and Misuses of Nonprescription Drugs." The course included an introductory lecture on factors associated with the choice of a drug and drug response, and a lecture on selected classes of nonprescription drugs. The lectures were supplemented by handouts, group discussion, "case studies," and, questions and answers. Nurses were then administered a two part post-test which consisted of ten questions from Part III of the pre-test and 7 open-ended questions on drug interactions. Finally, nurses were invited to submit, within two months following the course, written statements on the usefulness and value of the course.

Two different groups of pharmacists participated in the study. Group I consisted of 90 pharmacists who were

administered Part III of the pre-test given to the nurses. Group II pharmacists consisted of 98 pharmacists who were administered a 20 statement opinionnaire. Demographic data collected from both groups of pharmacists included: community size in which they practiced, type of pharmacy practice, highest degree received, and tenure of practice. Pharmacists who took the cognitive test were asked to indicate the extent to which they advised patients about OTC's on an individual and a group basis. Those taking the opinionnaire were asked to indicate their interest in participating in a continuing education workshop on non-prescription drugs.

A one way analysis of variance test was used to identify significant differences between groups. Mean scores for individual questions on Part III of the nurses' pre-test and for the pharmacists' cognitive test were analyzed for significant differences by use of the t-test. Mean scores for individual questions on Part I of the nurses' post-test and the pharmacists' cognitive test also were analyzed for significant differences by use of the t-test. The one way analysis of variance was used to identify significant differences among sub-groups of the demographic variables for the pharmacists' cognitive test and the opinionnaire. Results were significant at the 5 percent

level. The Hoyt Reliability Coefficient computed from Part III of the nurses' pre-test and the pharmacists' cognitive test was 0.7149 which was judged adequate for group measurement.

Nearly two-thirds of the pharmacists who took the cognitive test were engaged in community pharmacy practice. Most practiced in communities which have 25,000 or more residents. Their average tenure of practice was computed to be 12.5 years, and there was nearly an equal distribution of four- and five-year Bachelor of Science in Pharmacy degree recipients. Overall, pharmacists had a mean score of 72.00 percent correct for the 13 questions selected for analysis.

The cognitive test was analyzed for two subgroups of the "highest degree" variable. Pharmacists who matriculated under the five year pharmacy curriculum averaged 76.0 percent correct; those who studied under the four year curriculum averaged 69.6 percent correct. The difference was statistically significant. It is suggested that the difference may be attributed to the change in the length of the pharmacy curriculum and to the introduction of the concept and importance of drug interactions in the five year curriculum.

Individual questions on the cognitive test were analyzed for significant differences between four- and five-year graduates. The five year graduates' mean percent correct scores were higher than the four year graduates corresponding scores on all questions except four. The four year graduates' mean percent correct scores were higher than the five year graduates' corresponding scores on three questions. There was a significant difference found in favor of four year graduates on Question 9 which related to harmful effects of prolonged use of sodium bicarbonate. A significant difference in favor of five year graduates was found on Question 14 which related to the adverse reactions of aspirin. Neither subgroup performed well on Question 7 which related to the mechanism of action of saline cathartics. Both groups averaged less than 50 percent correct on Question 5 which concerned the rationale for contraindicating concurrent administration of tolbutamide and alcoholic beverages. Both groups scored very high on questions relating to (1) the rationale for contraindicating concurrent use of alcoholic beverages and barbiturates; (2) the alternative analgesic-antipyretic drug of choice to aspirin; (3) adverse reactions to phenylpropanolamine; (4) use of dextromethorphan; (5) active ingredient in OTC sleep aids; and (6) interaction of calcium-containing antacids and milk with tetracycline.

Pharmacists who had practiced less than 15 years scored significantly higher on the cognitive test than those who had practiced 15 or more years. No significant differences were found between pharmacists engaged in community practice and those in hospital pharmacy practice. No significant differences were found between pharmacists who practiced in communities with populations of 50,000 or fewer residents and those who practiced in communities of over 50,000 population.

Sixty-five pharmacists reported advising patients on a 1-1 basis. Extent of advice ranged from 1 - 10 times per day to 30 or more per day. Mean scores for three subgroups of this variable were analyzed for significant differences and none were found. Fifty-eight of the 90 pharmacists reported never advising on a group basis. Eighteen pharmacists reported offering group advice from less than once per year to once per month. The median for this group was once per year. It would appear that more pharmacists could offer advice on a per patient and on a group basis.

Only three of the 98 pharmacists who completed the opinionnaire reported being engaged in hospital pharmacy practice. Eighty-seven reported community pharmacy practice. Sixty-one of the respondents had received the four year Bachelor of Science in Pharmacy degree. Thirty-one

received the five year Bachelor of Science in Pharmacy degree. The sample was nearly equally divided between pharmacists with less than 15 years practice and those with 15 or more years practice.

Pharmacists strongly agreed that the pharmacist "should advise patients on the use of non-prescription drugs." They also strongly agreed that "When a patron wishes to know more about an OTC drug product, he should ask a pharmacist." Strong disagreement was found for the statement: "Pharmacists should not advise patients on uses of non-prescription drugs." They held the positive opinion that they would advise more patients if patients requested them to do so. They held negative opinions that (a) pharmacists should only advise after consultation with physicians; (b) advising is tantamount to medically diagnosing the patient; and (c) pharmacists are too busy to advise on OTC's. They disagreed that (a) the teaching of drug usage to the general public "is not in the domain of professional responsibilities of pharmacists;" (b) OTC's are safe enough not to warrant professional advice; (c) pharmacists are not adequately informed, lack teaching skills, lack communication skills or feel incompetent to teach groups about OTC's; or (d) pharmacists should teach clerks to be advisors to the self-medicating public.

Eighty-nine of the 98 pharmacists expressed interest in participating in a continuing education workshop on OTC's.

In general, pharmacists held positive opinions about their roles as advisors to the self-medicating public.

Individual opinionnaire statements were analyzed for significant differences between pharmacists who practiced less than 15 years and those with 15 or more years tenure. A significant but unimportant difference was found for the statement which read, "Pharmacists should not advise patients on uses of non-prescription drugs." A significant, but unimportant difference also was found for the statement: "The advising of patients on selection of non-prescription drugs by a pharmacist is tantamount to diagnosing a patient's medical condition by a pharmacist." Only slight differences in rankings were found for these two sub-groups.

The statements were analyzed for significant differences among three subgroups of the "community size" variable. No significant differences were found. There was a difference in rankings of statements by the three subgroups.

It is suggested by these results that pharmacists:

- (a) are willing to advise patients on uses of nonprescription medications;
- (b) that many do advise on a per patient

basis; (c) recognize a professional responsibility to advise patients on OTC's; (d) are less willing to teach groups; (e) feel adequately informed to teach individuals and groups; (f) have good comprehension of OTC ingredients, reactions and adverse reactions; and (g) would welcome formal continuing education on nonprescription drugs.

No significant differences between Group I and Group II nurses were found for any section of the pre-test or for the overall scores on the pre-test. The nurses averaged 83.8 percent correct on Part I; 55.9 percent correct on Part II; and 38.4 percent correct on Part III of the pre-test. Nurses had difficulty matching medical use terminology with OTC products. Many did not recognize that Tylenol is an analgesic and an antipyretic and that aspirin is an inflammatory agent. Their performance on Part III indicated that they had difficulty correctly responding to the questions asked. A total of 53.1 percent of the nurses responded that they first hear about an over-the-counter product via television commercials. A total of 88.5 percent answered "yes" to the Question: "Do you ever purchase over-the-counter products for yourself or for a member of the family;" 51.1 percent responded that they purchase their products from neighborhood pharmacies. Thirty-eight said they ask their pharmacist for additional information on

OTC's whenever they wish to know more about them. Nurses reported purchasing all of the type products listed except "tonics." The frequency of purchase varied from once per week for some nurses who buy "fever reducers" to once per year for many of the remaining products. Nurses responded that they expected the course "Uses and Misuses of Over-the-Counter Drugs" to be of value to them in their everyday work situations, and in their contacts with family and friends.

Nurses improved their scores on the post-test. The mean percent correct rose from 38.4 percent on the pre-test to 77.9 percent on the post-test. The conclusion can be made that nurses gained in knowledge following instruction on OTC's. This conclusion is supported by the fact that nurses also answered the majority of post-test, Part II questions satisfactorily. Statements submitted by nurses within two months after completion of the course revealed that the nurses found the course to be useful to them in their practice and with their contacts with family, neighbors and friends.

Nurses' pre-test mean scores for Part III were compared with pharmacists' scores on the cognitive test. Pharmacists' mean scores for correct answers were significantly higher than the nurses' corresponding scores on all

but four of the 13 questions. Nurses mean percent correct scores were higher than pharmacists' corresponding scores on the question which related to concurrent administration of tolbutamide and alcoholic beverages and on the question which related to the mechanism of action of saline cathartics. The results were not significant. No significant differences were found between the two groups on the questions concerning concurrent administration of barbiturates and alcoholic beverages and the adverse reactions of aspirin.

Nurses' post-test scores for Part I were compared with pharmacists' scores on the cognitive test for individual questions. Significant differences in favor of the nurses were found for the following questions: (a) Question 5 which concerned the concurrent administration of tolbutamide and alcoholic beverages; (b) Question 7 which related to the mechanism of action of saline cathartics; (c) Question 10 which related to the preferred dosage form for nasal decongestants that are to be in use for over two days; and (d) Question 14 which related to the adverse reactions of aspirin. For all other questions, the nurses mean percent correct score improved, but not enough to erase the significant differences which were shown between nurses' pre-test results and pharmacists' results. There were

significant differences for all remaining questions except Question 13 which asked for the drug of choice for alleviating productive coughs.

It is suggested by these results that nurses (a) gained in knowledge of nonprescription medications and the implications of their use; (b) increased their awareness that all drugs can be misused and will, consequently, observe precautions when administering, taking or advising about medications; (c) found the information gained from the instruction and the other experiences useful to them in their professional and personal contacts; and (d) will be willing to discuss and question pharmacists about nonprescription medications and drug interactions.

RECOMMENDATIONS

As a result of this study, the following recommendations are made:

- (1) That further study be conducted to determine:
 - (a) the extent to which consumers utilize pharmacists and nurses for information on nonprescription medications;
 - (b) the receptiveness of the public to the pharmacist's role as a drug therapy advisor; and
 - (c) the extent to which nurses and pharmacists serve as advisors on drug therapy to the general public.

(2) That continuing education, in the form of a workshop on nonprescription drugs, be offered to pharmacists.

(3) That efforts be continued to increase the public's awareness of the potential hazards and benefits of nonprescription medication. That efforts be expanded to encourage the public to consult health professionals, especially pharmacists, for information on nonprescription medications.

(4) That efforts to increase nurses' knowledge of nonprescription medications be continued through offering courses similar to the one developed for this study to other nurses. That nurses be encouraged to use this knowledge to advise patients on the proper use of OTC's. That nurses be encouraged to educate patients to consult with pharmacists about OTC and prescription drug therapy

(5) That studies be undertaken to determine physicians' knowledge about names, uses and interactions of nonprescription medications.

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APPENDIX 1

PRE-TEST, NURSES (GROUP I)

OVER-THE-COUNTER DRUGS: KNOWLEDGE AND PRACTICES TEST

Common Uses of Over-The-Counter Drug Products

- I. **DIRECTIONS:** The list on the left side of this page contains some technical names for uses of drug products. The list on the right side contains names which can be matched to the technical names. Match the names on the right side with those on the left side by placing a number from column two in the space provided in column one.

<u>Column One</u>	<u>Column Two</u>
_____ Analgesic	1. Reduces fever
_____ Antacid	2. Expels worms from the digestive tract
_____ Antipyretic	3. Promotes vomiting
_____ Expectorant	4. Relieves itching
_____ Antitussive	5. Promotes flow of urine
_____ Antipruritic	6. Relieves "gas"
_____ Laxative	7. Relieves pain
_____ Antidiarrheic	8. Coats the stomach
_____ Anticoagulant	9. Causes breakup of cough; enables one to expel materials that cause the cough.
_____ Antiemetic	10. Opens air passages of nose, bronchial system
_____ Emetic	11. Promotes bowel evacuation
_____ Hypnotic	12. Promotes sleep
_____ Anthelmintic	13. Softens skin
_____ Hematinic	14. Stops vomiting
_____ Diuretic	15. Very strong product to evacuate bowels
_____ Purgative	16. Calms cough reflex
_____ Decongestant	17. Treats anemia
_____ Demulcent	18. Controls loose stools
_____ Emollient	19. Prevents blood from clotting
_____ Carminative	20. Acid neutralizer

II. **DIRECTIONS:** Now match the names of products in column one with the technical names for their use in column two. (Some numbers may have more than one correct answer.)

<u>Column One</u>	<u>Column Two</u>
1. Aspirin	_____ Diuretic
2. Kaopectate ^R	_____ Antitussive
3. Robitussin ^R	_____ Analgesic
4. Maalox ^R	_____ Expectorant
5. Dramamine ^R	_____ Decongestant
6. Tylenol ^R	_____ Antipruritic
7. Doan's Pills ^R	_____ Sedative
8. Calamine Lotion	_____ Antidiarrheic
9. Castor Oil	_____ Anti-inflammatory agent
10. Pepto-Bismol ^R	_____ Anthelmintic
11. Nervine ^R	_____ Antipyretic
12. Jayne's P.W. ^R	_____ Purgative
13. Vick's Formula 44 ^R	_____ Antacid
14. Neosynephrine Drops ^R	_____ Demulcent

III. **DIRECTIONS:** For each of the following items, please indicate which one of the alternatives you believe most accurately illustrates the situation, event or principle of the item or answers the question. Please circle your choices.

1. Alcoholic beverages would be contraindicated in patients receiving barbiturates because--
 - a) CNS depressant action is potentiated
 - b) " " " " decreased
 - c) " stimulant " " potentiated
 - d) effects on CNS are neutralized

2. Product formulation affects the rate of dissolution and, therefore, the rate of onset of action of a drug. Which of the following statements is generally correct?
 - a) Tablets dissolve faster than capsules, than pills.
 - b) Capsules " " " pills, " tablets.
 - c) Capsules " " " tablets, " pills.
 - d) Pills " " " capsules, " tablets.

3. Individuals, especially those with peptic ulcers, or those taking certain prescription drugs, should avoid aspirin-type pain relievers. One alternative drug which lacks the side effects of aspirin but is an effective analgesic-antipyretic is--
 - a) phenacetin
 - b) acetanilid
 - c) acetaminophen
 - d) antipyrine

4. Contac [®] and similar cold-hay fever products contain drugs such as phenylpropanolamine HCl, a sympathomimetic drug. This drug may--
 - a) cause a hypertensive crisis
 - b) interact with certain antidepressants
 - c) cause cardiac palpitation
 - d) all of the above
 - e) none of the above

5. Concurrent administration of tolbutamide (Orinase [®]) and alcohol is contraindicated. One most logical reason for this is--
 - a) Excretion of unchanged tolbutamide is decreased.
 - b) Alcohol and tolbutamide competitively inhibit each other's metabolism.
 - c) Tolbutamide does not dissolve in alcohol.
 - d) Alcohol increases rate of metabolism of tolbutamide.

6. Dextromethorphan is widely used as a--
 - a) narcotic analgesic
 - b) non-narcotic analgesic
 - c) expectorant
 - d) cough reflex suppressant

7. Saline cathartics (laxatives) exert their action by--

- a) increasing volume of water retained in small intestines and mechanically stimulating purgation
- b) increasing volume of water retained in large intestines and mechanically stimulating purgation
- c) increasing volume of water retained in large intestines and softening fecal matter
- d) taking up water and forming soft gel

8. Many over-the-counter "sleep aids" contain, as their active ingredient, an--

- a) analgesic
- b) antipyretic
- c) antacid
- d) antihistamine

9. Sodium bicarbonate can be harmful if used chronically because it--

- a) induces gastric emptying, belching
- b) removes too much sodium from the body
- c) stimulates production of HCl, may cause alkalosis
- d) is constipating

10. When it is necessary to use a "nasal decongestant" for more than two days, the preferred dosage form is--

- a) a capsule, tablet or liquid taken orally
- b) oily nosedrops
- c) aqueous nosedrops
- d) a suspension

11. Mineral oil--

- a) is a bulk forming laxative
- b) is a stimulant laxative
- c) can cause lipid pneumonia
- d) increases gastric emptying time

12. Antacids, especially calcium-containing antacids, and milk--

- a) interfere with absorption of tetracycline
- b) decrease absorption of aspirin
- c) increase absorption of anticoagulants
- d) interfere with absorption of penicillin

13. Of the drugs listed below, the one of choice for alleviating productive coughs is--

- a) ammonium chloride
- b) codeine
- c) phenylephrine HCl
- d) chlorpheniramine maleate

14. Very large doses of aspirin, alone or in combination, can--

- a) cause ototoxicity
- b) cause bleeding in GI tract
- c) interact with anticoagulants, causing hemorrhaging
- d) all of the above
- e) b and c above

Will you answer a few more questions for me?

1. Where do you first hear about an over-the-counter drug product? (Check appropriate blank.)

- From your: _____ Physician _____ Clinic
 _____ Pharmacist _____ Television commercial
 _____ Drug clerk _____ Newspaper or magazine advertising
 _____ Neighbor _____ Member of the family
 _____ Friend _____ Other (please indicate who, but not by name)

2. Do you ever purchase over-the-counter drug products for yourself or for a member of the family?

No _____; Yes _____. If yes, will you answer the following questions: (check applicable spaces)

About how often do you buy:	<u>once/week</u>	<u>once/mo.</u>	<u>2/year</u>	<u>Other</u>	<u>Never</u>
Fever Reducers	_____	_____	_____	_____	_____
Pain Killers	_____	_____	_____	_____	_____
"Indigestion" Remedies	_____	_____	_____	_____	_____
Laxatives	_____	_____	_____	_____	_____
Vitamins	_____	_____	_____	_____	_____
Cough Syrups	_____	_____	_____	_____	_____
Cold Capsules or tablets	_____	_____	_____	_____	_____
Antihistamines	_____	_____	_____	_____	_____
External cold products	_____	_____	_____	_____	_____
Remedies for corns & callouses	_____	_____	_____	_____	_____
Tonics	_____	_____	_____	_____	_____
Sleep Aids	_____	_____	_____	_____	_____
Weight control products	_____	_____	_____	_____	_____
Others (list them by type)	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

3. Where do you purchase your products for self-medication? (check appropriate blank)

- _____ Neighborhood Pharmacy _____ Supermarket
 _____ Chain Drugstore _____ Neighborhood Grocery
 _____ Discount Store _____ Other

4. When you wish to know more about a product, to whom or where do you go for additional information?

 your doctor your pharmacist a drug clerk
 a friend the newspaper a clinic
 other printed material no one other ()

5. Of what value, if any, do you think this information on over-the-counter medication is (or will be) to you in the following situations:

Personal

Your contacts with other members of the family

Your contacts with patients

Your contacts with friends

6. How do you plan to use the material you expect to learn?

Please give me your social security number

Please check type of practice you are currently engaged in:

 Public Health Nursing Visiting Nurse RN, Nursing Home
 School Nurse RN, Hospital RN, Extended Care
 Other (please list in blank below) Facility

APPENDIX 2

POST-TEST, NURSES (GROUP I)

OVER-THE-COUNTER DRUGS

- I. DIRECTIONS: For each of the following items, please indicate which one of the alternatives you believe most accurately illustrates the situation, event or principle of the item or answers the question. Please circle your choices.
1. When it is necessary to use a "nasal decongestant" for more than two days, the preferred dosage form is --
 - a) a capsule, tablet or liquid taken orally
 - b) oily nosedrops
 - c) aqueous nosedrops
 - d) a suspension
 2. Contac ® and similar cold-hay fever products contain drugs such as phenylpropanolamine HCL, a sympathomimetic drug. This drug may --
 - a) cause a hypertensive crisis
 - b) interact with certain antidepressants
 - c) cause cardiac palpitation
 - d) all of the above
 - e) none of the above
 3. Sodium bicarbonate can be harmful if used chronically because it --
 - a) induces gastric emptying, belching
 - b) removes too much sodium from the body
 - c) stimulates production of HCL, may cause alkalosis
 - d) is constipating
 4. Dextromethorphan is widely used as a --
 - a) narcotic analgesic
 - b) non-narcotic analgesic
 - c) expectorant
 - d) cough reflex suppressant

5. Saline cathartics (laxatives) exert their action by --
- increasing volume of water retained in small intestines and mechanically stimulating purgation
 - increasing volume of water retained in large intestines and mechanically stimulating purgation
 - increasing volume of water retained in large intestines and softening fecal matter
 - taking up water and forming soft gel
6. Very large doses of aspirin, alone or in combination, can --
- cause ototoxicity
 - cause bleeding in GI tract
 - interact with anticoagulants, causing hemorrhaging
 - all of the above
 - b and c above
7. Antacids, especially calcium-containing antacids, and milk --
- interfere with absorption of tetracycline
 - decrease absorption of aspirin
 - increase absorption of anticoagulants
 - interfere with absorption of penicillin
8. Of the drugs listed below, the one of choice for alleviating productive coughs is --
- ammonium chloride
 - codeine
 - phenylephrine HCL
 - chlorpheniramine malente
9. Concurrent administration of tolbutamide (Orinase R) and alcohol is contraindicated. One most logical reason for this is --
- Excretion of unchanged tolbutamide is decreased.
 - Alcohol and tolbutamide competitively inhibit each other's metabolism.
 - Tolbutamide does not dissolve in alcohol.
 - Alcohol increases rate of metabolism of tolbutamide.

10. Product formulation affects the rate of dissolution and, therefore, the rate of onset of action of a drug. Which of the following statements is generally correct?

- a) Tablets dissolve faster than capsules, than pills.
- b) Capsules dissolve faster than pills, than tablets.
- c) Capsules dissolve faster than tablets, than pills.
- d) Pills dissolve faster than capsules, than tablets.

II. List one R_x-OTC-food interaction for each of the following OTC drug types or products:

Analgesic: _____

Laxative: _____

Antacid: _____

Antihistamine: _____

Alcohol: _____

Cheese: _____

Decongestants: _____

APPENDIX 3

PRE-TEST, NURSES (GROUP II)

APPENDIX 4

POST-TEST, NURSES (GROUP II)

OVER-THE-COUNTER DRUGS

- I. DIRECTIONS: For each of the following items, please indicate which one of the alternatives you believe most accurately illustrates the situation, event or principle of the item or answers the question. Please circle your choices.
1. When it is necessary to use a "nasal decongestant" for more than two days, the preferred dosage form is --
 - a) a capsule, tablet or liquid taken orally
 - b) oily nosedrops
 - c) aqueous nosedrops
 - d) a suspension
 2. Contac R and similar cold-hay fever products contain drugs such as phenylpropanolamine HCL, a sympathomimetic drug. This drug may--
 - a) cause a hypertensive crisis
 - b) interact with certain antidepressants
 - c) cause cardiac palpitation
 - d) all of the above
 - e) none of the above
 3. Sodium bicarbonate can be harmful if used chronically because it--
 - a) induces gastric emptying, belching
 - b) removes too much sodium from the body
 - c) stimulates production of HCL, may cause alkalosis
 - d) is constipating
 4. Dextromethorphan is widely used as a --
 - a) narcotic analgesic
 - b) non-narcotic analgesic
 - c) expectorant
 - d) cough reflex suppressant
 5. Saline cathartics (laxatives) exert their action by--
 - a) increasing volume of water retained in small intestines and mechanically stimulating purgation
 - b) increasing volume of water retained in large intestines and mechanically stimulating purgation
 - c) increasing volume of water retained in large intestines and softening fecal matter
 - d) taking up water and forming soft gel

6. Very large doses of aspirin, alone or in combination, can--
 - a) cause ototoxicity
 - b) cause bleeding in GI tract
 - c) interact with anticoagulants, causing hemorrhaging
 - d) all of the above
 - e) b and c above

7. Antacids, especially calcium-containing antacids, and milk--
 - a) interfere with absorption of tetracycline
 - b) decrease absorption of aspirin
 - c) increase absorption of anticoagulants
 - d) interfere with absorption of penicillin

8. Of the drugs listed below, the one of choice for alleviating productive coughs is--
 - a) ammonium chloride
 - b) codeine
 - c) phenylephrine HCL
 - d) chlorpheniramine maleate

9. Concurrent administration of tolbutamide (Orinase^R) and alcohol is contraindicated. One most logical reason for this is--
 - a) Excretion of unchanged tolbutamide is decreased.
 - b) Alcohol and tolbutamide competitively inhibit each other's metabolism.
 - c) Tolbutamide does not dissolve in alcohol.
 - d) Alcohol increases rate of metabolism of tolbutamide.

10. Which of the following products is essentially a stimulant laxative?
 - a) Fleet's Phospho-Soda
 - b) Carter's Little Pills
 - c) Colace
 - d) Haley's MO

II. List one R -OTC-food interaction for each of the following OTC drug types^x or products:

Analgasic: _____

Laxative: _____

Antacid: _____

Antihistamine: _____

Alcohol: _____

Cheese: _____

Decongestants: _____

APPENDIX 5

COVER LETTER, PHARMACISTS

(COGNITIVE TEST)



EXTENSION SERVICES IN PHARMACY

October, 1973

Dear Fellow Pharmacist:

Your cooperation is needed to assist Extension Services in Pharmacy (ESP) in determining the continuing education needs of pharmacists in Wisconsin.

We are asking you to take about fifteen minutes to complete the attached "General Knowledge of Over-the-Counter Drugs" fourteen-item test. Please complete the test independently, and return it to Marie Best during the Institute, preferably by the end of the first coffee break on Thursday, October 25th.

This test represents part III of a similar instrument administered to fifty-one nurses in June, 1973. We need your responses to the same items to enable us to assess baseline knowledge differences as part of a dissertation research project. Another phase will assess pharmacists' opinions on teaching and advising patients on uses and misuses of non-prescription drugs. We ask for your social security number as a means of avoiding duplication of pharmacists participating in the project.

All individual replies are confidential. We hope to publish results of this project in one of the leading professional journals. We hope, also, to determine interest in and need for continuing education on non-prescription drugs.

Thank you for your cooperation.

Professionally yours,

Marie L. Best

Marie L. Best
Assistant Professor, Youth Development

Melvin H. Weinswig

Melvin H. Weinswig
Professor-Pharmacy
Chairman, Extension Services in Pharmacy

APPENDIX 6

PHARMACISTS' COGNITIVE TEST:

GENERAL KNOWLEDGE OF OVER-THE-COUNTER DRUGS

GENERAL KNOWLEDGE OF OVER-THE-COUNTER DRUGS

DIRECTIONS: For each of the following items, please indicate which one of the ²⁰⁶ alternatives you believe most accurately illustrates the situation, event, or principle of the item or answers the question. Please circle your choices.

1. Alcoholic beverages would be contraindicated in patients receiving barbiturates because--
 - a) CNS depressant action is synergized
 - b) CNS depressant action is decreased
 - c) CNS stimulant action is potentiated
 - d) depressant effects on CNS are neutralized

2. Product formulation affects the rate of dissolution and, therefore, the rate of onset of action of a drug. Which of the following statements is generally correct? (exclude sustained action formulations)
 - a) Tablets dissolve faster than capsules, than pills.
 - b) Capsules dissolve faster than pills, than tablets.
 - c) Capsules dissolve faster than tablets, than pills.
 - d) Pills dissolve faster than capsules, than tablets.

3. Individuals, especially those with peptic ulcers, or those taking certain prescription drugs, should avoid aspirin-type pain relievers. The drug of choice which lacks the side effects of aspirin but is an effective analgesic-antipyretic is--
 - a) phenacetin
 - b) acetanilid
 - c) acetaminophen
 - d) antipyrine

4. Contac ^(R) and similar cold-hay fever products contain drugs such as phenylpropanolamine HCl, a sympathomimetic drug. This drug may--
 - a) cause a hypertensive crisis
 - b) interact with certain antidepressants
 - c) cause cardiac palpitation
 - d) all of the above
 - e) none of the above

5. Concurrent administration of tolbutamide (Orinase ^(R)) and alcohol is contraindicated. One most logical reason for this is--
 - a) Excretion of unchanged tolbutamide is decreased.
 - b) Alcohol and tolbutamide competitively inhibit each other's metabolism.
 - c) Tolbutamide does not dissolve in alcohol.
 - d) Alcohol increases rate of metabolism of tolbutamide.

6. Dextromethorphan is widely used as a--
 - a) narcotic analgesic
 - b) non-narcotic analgesic
 - c) expectorant
 - d) cough reflex suppressant

7. Saline cathartics exert their action by-- 207
- a) increasing volume of water retained in small intestines and mechanically stimulating purgation
 - b) increasing volume of water retained in large intestines and mechanically stimulating purgation
 - c) increasing volume of water retained in large intestines and softening fecal matter
 - d) taking up water and forming soft gel
8. Many over-the-counter "sleep aids" contain, as their active ingredient, an--
- a) analgesic
 - b) antipyretic
 - c) antacid
 - d) antihistamine
9. Sodium bicarbonate can be harmful if used chronically because it--
- a) induces gastric emptying, belching
 - b) removes too much sodium from the body
 - c) stimulates production of HCl, may cause alkalosis
 - d) is constipating
10. When it is necessary to use a "nasal decongestant" for more than two days, the preferred dosage form is--
- a) a capsule, tablet or liquid taken orally
 - b) oily nosedrops
 - c) aqueous nosedrops
 - d) a suspension
11. Mineral oil--
- a) is a bulk forming laxative
 - b) is a stimulant laxative
 - c) can cause lipid pneumonia
 - d) increases gastric emptying time
12. Antacids, especially calcium-containing antacids, and milk--
- a) interfere with absorption of tetracycline
 - b) decrease absorption of aspirin
 - c) increase absorption of anticoagulants
 - d) interfere with absorption of penicillin
13. Of the drugs listed below, the one of choice for alleviating productive coughs is--
- a) ammonium chloride
 - b) codeine
 - c) phenylephrine HCl
 - d) chlorpheniramine malente
14. Very large doses of aspirin, alone or in combination, can--
- a) cause ototoxicity
 - b) cause bleeding in GI tract
 - c) interact with anticoagulants, causing hemorrhaging
 - d) all of the above
 - e) b and c above

1. Your social security number is _____.

2. Please check appropriate blank to indicate your type of pharmacy practice: ²⁰⁸

- _____ community pharmacy (1-2 owner)
 - _____ small chain pharmacy (2-3 stores)
 - _____ large chain pharmacy (4 or more stores)
 - _____ hospital pharmacy, private
 - _____ hospital pharmacy (city, county, federal)
 - _____ other (please indicate type of practice below)
-

3. Please check appropriate blank to indicate size of community in which you practice:

- | | |
|--------------------------------|-------------------------------|
| _____ 5,000 or fewer residents | _____ 25,000-50,000 residents |
| _____ 5,000-9,999 residents | _____ over 50,000 residents |
| _____ 10,000-15,000 residents | |

4. Please indicate your highest degree obtained:

- | | |
|---------------------------------|----------------------------------|
| _____ Ph.C. | _____ B.S. in Pharmacy (5 year) |
| _____ Ph.G. | _____ D. Pharm. |
| _____ B.S. in Pharmacy (4 year) | _____ Other (please state below) |
-

5. Please indicate the approximate number of years you have practiced pharmacy:

- | | | |
|------------------|-------------------|---------------------|
| _____ 1-4 years | _____ 10-15 years | _____ over 20 years |
| _____ 5-10 years | _____ 15-20 years | |

On the average, about how many times per day do you give advice to patients on a one-to-one basis about non-prescription drugs?

On the average, about how often do you speak to groups about uses and misuses of non-prescription drugs?

APPENDIX 7

COVER LETTER, PHARMACISTS' OPINIONNAIRE

EXTENSION SERVICES IN PHARMACY

April 10, 1974

Dear Pharmacist:

We in Extension Services in Pharmacy would greatly appreciate your taking a few minutes to complete the enclosed opinionnaire. This instrument constitutes one phase of a research project on non-prescription drugs. It is designed to ascertain pharmacists' opinions about advising people on uses and misuses of over-the-counter drugs. We see this project as an important indicator of pharmacists' attitudes--and needs--with respect to their professional involvement as drug consultants.

At the completion of the project, we hope to publish the findings in a professional journal. More important, your honest opinions will help us determine your needs, if any, for continuing education on non-prescription drugs.

Thank you.

Professionally yours,

Melvin H. Weinswig
Melvin H. Weinswig

Marie L. Best
Marie L. Best

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Enclosure

APPENDIX 8

PHARMACISTS' OPINIONNAIRE

ADVISING AND TEACHING ABOUT OTC DRUGS

Opinionnaire

212

In the space preceding each of the following statements, please write the number which best expresses your opinion with respect to your pharmacy practice. All replies are confidential and will be used only for research purposes. Use the following rating scale.

Strongly Agree	Agree	Disagree	Strongly Disagree
4	3	2	1

- _____ 1. Pharmacists should advise patients on the proper use of non-prescription drugs.
- _____ 2. Pharmacists should advise patients on the proper use of OTC's only after consulting with a physician.
- _____ 3. Pharmacists should not advise patients on uses of non-prescription drugs.
- _____ 4. The advising of patients on selection of non-prescription drugs by a pharmacist is tantamount to diagnosing a patient's medical condition by a pharmacist.
- _____ 5. Pharmacists should only advise patients on use of those non-prescription drugs which are contraindicated by the prescription drug a patient is regularly taking.
- _____ 6. I am too busy to advise my patrons on the proper use of OTC drugs.
- _____ 7. Pharmacists are not adequately informed to provide accurate information on non-prescription drugs to patients.
- _____ 8. Pharmacists lack the teaching skills needed to teach people in groups about OTC drugs.
- _____ 9. Pharmacists feel incompetent when asked to teach groups of people about OTC drugs.
- _____ 10. Pharmacists are generally too busy to teach the public in groups about OTC drugs.
- _____ 11. Pharmacists should train clerks to advise patients on use of OTC drugs.
- _____ 12. Pharmacists are too busy to give needed advice to patients on prescription drugs.
- _____ 13. Pharmacists lack needed communication skills to teach the public in groups about OTC drugs.

- 14. The teaching of OTC drug usage to the general public is not in the domain of professional responsibilities of pharmacists.
- 15. When a patron wishes to know more about an OTC drug product, he should ask a pharmacist.
- 16. When a patron wishes to know more about an OTC drug product, he should ask a drug clerk.
- 17. Non-prescription drugs are generally safe enough so that patients do not need professional advice about their usage.
- 18. I would advise more patients about proper use of OTC's if only they would request it.
- 19. Pharmacists generally do not like the idea of teaching groups of people about OTC drugs.
- 20. I would offer to teach people about uses and misuses of OTC's if I knew more about the products.

Please check appropriate blank to indicate your primary type of practice.

- community pharmacy
- hospital pharmacy
- other (please indicate type of practice below)

Please check approximate size of community in which you practice.

- less than 5,000
- 5,000 - 9,999 residents
- 10,000 - 14,999 residents
- 15,000 - 24,999 residents
- 25,000 - 49,000 residents
- 50,000 or more

Please indicate the number of years you have practiced pharmacy.

- 1 - 4 years 10 - 14 years 20 years or more
- 5 - 9 years 15 - 19 years

Please indicate your highest degree received.

- Ph.C. B.S. (4 yrs.) Pharm.D.
- Ph.G. B.S. (5 yrs.) Other (please indicate)

Are you interested in participating in a one-day continuing education workshop on non-prescription drugs? Yes No

Comments: _____

Your Social Security number, please _____ (Needed only to facilitate coding and tabulation of data. All replies are strictly confidential.)

APPENDIX 9

DISTRIBUTION OF PHARMACISTS' RESPONSES
TO COGNITIVE TEST

DIRECTIONS: For each of the following items, please indicate which one of the alternatives you believe most accurately illustrates the situation, event, or principle of the item or answers the question. Please circle your choices.

1. Alcoholic beverages would be contraindicated in patients receiving barbiturates because--
 - a) CNS depressant action is synergized (86.67%)*
 - b) CNS depressant action is decreased (1.11%)
 - c) CNS stimulant action is potentiated (11.11%)
 - d) depressant effects on CNS are neutralized (1.11%)

2. Product formulation affects the rate of dissolution and, therefore, the rate of onset of action of a drug. Which of the following statements is generally correct? (exclude sustained action formulations)
 - a) Tablets dissolve faster than capsules, than pills.
 - b) Capsules dissolve faster than pills, than tablets.
 - c) Capsules dissolve faster than tablets, than pills.
 - d) Pills dissolve faster than capsules, than tablets.

3. Individuals, especially those with peptic ulcers, or those taking certain prescription drugs, should avoid aspirin-type pain relievers. The drug of choice which lacks the side effects of aspirin but is an effective analgesic-antipyretic is--
 - a) phenacetin (1.11%)
 - b) acetanilid 0
 - c) acetaminophen (97.78%)*
 - d) antipyrine (1.11%)

4. Contac[®] and similar cold-hay fever products contain drugs such as phenylpropanolamine HCl, a sympathomimetic drug. This drug may--
 - a) cause a hypertensive crisis (7.78%)
 - b) interact with certain antidepressants (4.44%)
 - c) cause cardiac palpitation (6.67%)
 - d) all of the above (77.78%)
 - e) none of the above (3.33%)

5. Concurrent administration of tolbutamide (Orinase[®]) and alcohol is contraindicated. One most logical reason for this is--
 - a) Excretion of unchanged tolbutamide is decreased. (2.22%)
 - b) Alcohol and tolbutamide competitively inhibit each other's metabolism. (41.11%)*
 - c) Tolbutamide does not dissolve in alcohol. (0)
 - d) Alcohol increases rate of metabolism of tolbutamide. (54.44%)

6. Dextromethorphan is widely used as a--
 - a) narcotic analgesic (0)
 - b) non-narcotic analgesic (1.11%)
 - c) expectorant (2.22%)
 - d) cough reflex suppressant (96.67%)

7. Saline cathartics exert their action by--

- a) increasing volume of water retained in small intestines and mechanically stimulating purgation (12.22%)*
- b) increasing volume of water retained in large intestines and mechanically stimulating purgation (68.89%)
- c) increasing volume of water retained in large intestines and softening fecal matter (14.44%)
- d) taking up water and forming soft gel (2.22%)

8. Many over-the-counter "sleep aids" contain, as their active ingredient, an--

- a) analgesic (2.22%)
- b) antipyretic (1.11%)
- c) antacid (1.11%)
- d) antihistamine (95.56%)*

9. Sodium bicarbonate can be harmful if used chronically because it--

- a) induces gastric emptying, belching (3.33%)
- b) removes too much sodium from the body (1.11%)
- c) stimulates production of HCl, may cause alkalosis (94.44%)*
- d) is constipating (1.11%)

10. When it is necessary to use a "nasal decongestant" for more than two days, the preferred dosage form is--

- a) a capsule, tablet or liquid taken orally (77.78%)*
- b) oily nosedrops (0)
- c) aqueous nosedrops (21.11%)
- d) a suspension (0)

11. Mineral oil--

- a) is a bulk forming laxative (6.67%)
- b) is a stimulant laxative (16.67%)
- c) can cause lipid pneumonia (6.67%)
- d) increases gastric emptying time (12.22%)

12. Antacids, especially calcium-containing antacids, and milk--

- a) interfere with absorption of tetracycline (96.67%)*
- b) decrease absorption of aspirin (0)
- c) increase absorption of anticoagulants (1.11%)
- d) interfere with absorption of penicillin (2.22%)

13. Of the drugs listed below, the one of choice for alleviating productive coughs is--

- a) ammonium chloride (73.30%)
- b) codeine (40.00%)
- c) phenylephrine HCl (0)
- d) chlorpheniramine malente (3.33%)

14. Very large doses of aspirin, alone or in combination, can--

- a) cause ototoxicity (1.11%)
- b) cause bleeding in GI tract (5.56%)
- c) interact with anticoagulants, causing hemorrhaging (2.22%)
- d) all of the above (46.67%)
- e) b and c above (43.33%)*

1. Your social security number is _____.

2. Please check appropriate blank to indicate your type of pharmacy practice:

- _____ community pharmacy (1-2 owner)
 - _____ small chain pharmacy (2-3 stores)
 - _____ large chain pharmacy (4 or more stores)
 - _____ hospital pharmacy, private
 - _____ hospital pharmacy (city, county, federal)
 - _____ other (please indicate type of practice below)
-

3. Please check appropriate blank to indicate size of community in which you practice:

- | | |
|--------------------------------|-------------------------------|
| _____ 5,000 or fewer residents | _____ 25,000-50,000 residents |
| _____ 5,000-9,999 residents | _____ over 50,000 residents |
| _____ 10,000-15,000 residents | |

4. Please indicate your highest degree obtained:

- | | |
|---------------------------------|----------------------------------|
| _____ Ph.C. | _____ B.S. in Pharmacy (5 year) |
| _____ Ph.G. | _____ D. Pharm. |
| _____ B.S. in Pharmacy (4 year) | _____ Other (please state below) |
-

5. Please indicate the approximate number of years you have practiced pharmacy:

- | | | |
|------------------|-------------------|---------------------|
| _____ 1-4 years | _____ 10-15 years | _____ over 20 years |
| _____ 5-10 years | _____ 15-20 years | |

On the average, about how many times per day do you give advice to patients on a one-to-one basis about non-prescription drugs?

On the average, about how often do you speak to groups about uses and misuses of non-prescription drugs?

APPENDIX 10

PURCHASING PRACTICES OF NURSES:

OTC PRODUCTS

NURSES' RESPONSES TO THE QUESTION: "DO YOU EVER PURCHASE OVER-THE-COUNTER PRODUCTS FOR YOURSELF OR FOR A MEMBER OF THE FAMILY?" DISTRIBUTION BASED ON NUMBER OF "YES" ANSWERS (92); ANSWERS FOR THE COMBINED GROUP.

Product Type	Once/week		Once/month		Twice/year		Other		Never		No Response	
	N	N	N	N	N	N	N	N	N	N	N	N
Fever Reducers	2	5	51	11	4	19						
Pain Killers	-	4	32	10	18	27						
Indigestion remedies	-	3	29	18	16	26						
Laxatives	1	2	11	10	38	30						
Vitamins	2	12	22	16	18	22						
Cough Syrups	2	-	29	20	9	32						
Cold Capsules or Tablets	-	1	19	10	27	35						
Antihistamines	1	1	18	7	29	36						
External cold products	-	3	10	13	27	39						
Remedies for corns & callouses	-	-	4	7	45	36						
Tonics	-	-	-	-	52	40						
Sleep Aids	-	-	1	2	51	38						
Weight Control Products	-	-	3	4	48	40						
Decongestant Nosedrops	-	-	-	1	-	-						
Miscellaneous	-	-	-	-	-	-						
Antacids	1	1	-	5	-	-						

APPENDIX 11

EXPECTED VALUE OF COURSE: NURSES

APPENDIX 11

NURSES' RESPONSES TO THE QUESTION: "HOW DO YOU PLAN TO USE THE MATERIAL YOU EXPECT TO LEARN? (REPORTED AS A COMBINED GROUP)"

Response	N	Percent
Use in everyday work; employment; in-service; Health Service; Emergency Room.	22	22.9%
Evaluate for personal use and at work	13	13.5
Good basis for continued learning; personal use.	2	2.1
Will know if product is of value and safe to use; can any be used that are not harmful?	4	4.2
Advisory; teaching; increase knowledge; dispensing; "older people;" students	10	10.4
Apply in any future situation where suitable; share what I learn with others who use OTC's	5	5.2
Advisory basis; caution patients regarding drugs without physician's orders; advise with better knowledge and judgment.	5	5.2
Multiple reasons: personal; family; care of residents; general public; general awareness to friends and contacts; watch for drug interactions; better understanding, better judgment in use of medications; develop better understanding and awareness of drugs, dangers, interactions.	22	22.9
No response	12	12.5
Not codable	1	1.1
Totals	96	100.0%

NURSES' RESPONSES TO THE QUESTION: "OF WHAT VALUE, IF ANY, DO YOU THINK THIS INFORMATION ON OVER-THE-COUNTER MEDICATION IS (OR WILL BE) TO YOU IN THE FOLLOWING SITUATIONS. . .:" (REPORTED AS A COMBINED GROUP)

Responses: Personal	N	Percent
Increase knowledge; avoid improper use; increase understanding; know interactions; increase awareness of possible hazards; increase awareness of problems; increase knowledge for self and to teach others	44	45.8%
Will know if product is of value and safe to use; proper dosage; discriminating purchases; more intelligent use; more reluctant to buy and to take.	15	15.6
Not codable	10	10.4
Of great value	5	5.2
Need a refresher	2	2.1
Teaching; advisory for family; watch family's intake and needs	2	2.1
No Response	18	18.8
Totals	96	100.0%

Responses: With Other Members Of Family	N	Percent
Increase knowledge, prevent improper use; judicial use in the home; give intelligent responses; teach; advise; explain	32	33.3

Responses: With Other Members of Family (cont.)

	N	Percent
Discourage habitual use; try and inform of harmful effects; warn of cautions; increase awareness of hazards; share knowledge; warn of cautions; help them realize that problems can occur; help direct their choices.	17	17.7%
Will know if product is of value and safe; what to give children; influence husband; reluctant to give anything without prescription; keeping current with husband who is R.Ph.	10	10.4
Of great value	8	8.3
To reduce common ailments	2	2.1
No response	27	28.1
Totals	96	99.9*

*Due to rounding		

Responses: With Patients

	N	Percent
Guidance and counseling; teaching; explaining what hospital drugs equal OTC's; answering questions; better able to advise on interactions; alertness; increase awareness of drug interactions and overuse of medications; Advisory; Rx-OTC interactions.	45	46.9%
Hard to tell, work in surgery; I would not recommend; increase personal confidence; much; some; little	11	11.5
Will know if product is safe and valuable; better knowledge; increase awareness of possible hazards and dangers; avoid, discourage use by sharing knowledge; help to educate them if they're going to buy.	8	8.3

Response: With Patients (cont.)

	N	Percent
Discourage their use, explain why; carefully remove all they bring in and alert MD, reluctant to give what is not MD ordered.	2	6.3
None	2	2.1
No response	24	25.0
Totals	96	100.1*

Responses: With Friends

Discourage use, explain why; Advisory; respect for advice; intelligent discussions; let them know of some dangers; hesitate to advise; health teaching; correct usage.	50	52.1%
Will know if product is safe and of value; increase awareness of possible dangers; avoid, discourage use by sharing knowledge.	5	5.2
"A check mark, only"	3	3.1
None, I don't prescribe for friends.	3	3.1
Interactions with drugs.	1	1.1
To reduce common ailments.	1	1.1
No response	33	34.4
Totals	96	100.1*

*Due to rounding.

APPENDIX 12

NURSES' RESPONSES TO PART II OF POST TEST

NURSES' RESPONSES TO PART II - POST TEST: LISTINGS
OF DRUG INTERACTIONS RESPONSES FOR THE COMBINED GROUP

DRUG OR PRODUCT	INTERACTION	N	PERCENT	
Analgesic	Aspirin-anticoagulant	63	62.4%	
	Aspirin-Tolbutamide	3	3.0	
	Aspirin-Alcohol	14	13.9	
	Aspirin-Hemorrhage	3	3.0	
	Aspirin-Alcohol- Hypertensives	1	1.0	
	Empirin-Fluid retention	1	1.0	
	Allergy-Maalox	9	8.9	
	Aspirin-Barbiturates	2	2.0	
	No response	5	5.0	
	Totals		101	100.2%*
	Laxative	Mineral Oil-Fat Soluble Vitamins	45	44.6
Interaction with diuretics		9	8.9	
Saline-cardiac condition		3	3.0	
Saline-water retention		1	1.0	
Castor oil-harsh; special diets-bowel disease		2	2.0	
Examples given (MOM, Colace, etc.) yields severe diarrhea		18	17.8	
Licorice; abdominal pain		4	4.0	
Ca++ products with milk; prevents absorption of food essentials		2	2.0	
No response or not codable		17	16.8	
Totals			101	100.1*
Antacid		Calcium (or examples) - Tetracycline	26	25.7
	Tums-kidneys (or other)	6	5.9	
	NaHCO ₃ --too much acid	8	7.9	
	Alcohol; diuretics, anti- coagulants	10	9.9	
	Various products--tran- quilizers or other drugs	21	20.8	

Drug or Product	Interaction	N	Percent
Antacid (continued)	Antacid-aspirin-bleeding	11	10.9
	Electrolyte imbalance	2	2.0
	No response	<u>17</u>	<u>16.8</u>
	Totals	101	99.9*
Antihistamines	Antihistamines-alcohol; Contac-alcohol	42	41.6
	Cold preparations-alcohol	14	13.9
	Hypertensives; thyroid, heart; avoid antihista- mines	16	15.8
	Various products named- interact with alcohol, oral antidiabetics, sleeping pills, etc.	1	1.0
	Antipyretic	6	5.9
	Interacts with CNS depres- sant drugs	<u>22</u>	<u>21.8</u>
	No response		
	Totals	101	100.0
Alcohol	Tolbutamide; other oral antidiabetics	75	74.3
	Coumadin	3	3.0
	Valium, Librium, others, sedatives, CNS depres- sants	4	4.0
	Aspirin	3	3.0
	Orinase, barbiturates, tranquilizers, multiple answers	5	5.0
	Antihypertensives and tetracycline	1	1.0
	Reducing drugs, coffee, barbs	4	4.0
	No response	<u>6</u>	<u>5.9</u>
	Totals	101	100.2*
	Cheese	With MAOI's	46
With Peritrate, Stelazine		7	6.9
With antihypertensives		5	5.0
With tetracycline		19	18.8
With coumadin, tranquili- zers		2	2.0
Cholesterol, gout, heart, diuretics		5	5.0

Drug or Product	Interaction	N	Percent
Cheese (continued)	Licorice; Kaolin-swiss cheese	3	3.0
	No response	<u>14</u>	<u>13.9</u>
	Totals	101	100.1*
Decongestants	Hypertensives	5	5.0
	Alcohol, cold preps. sedatives	57	56.4
	Digitalis; heart patients	4	4.0
	Antagonistic to codeine	3	3.0
	No response	<u>32</u>	<u>31.7</u>
	Totals	101	100.1*

*Due to rounding.

APPENDIX 13

POST-HOC EVALUATION STATEMENTS:

NURSES (GROUP I)

APPENDIX 13

NURSES' POST HOC STATEMENTS:
EVALUATIONS OF COURSE

Group I

- 1) For many years my contact with hospital patients has been limited to the surgical patient in the operating room so my interest in this course was because of the self-medication done by family and friends.

Because I do not believe in taking any medication not prescribed by a doctor I had failed to realize how much influence advertising has on the sale of non-prescription drugs. In March of this year a relative living alone in Florida became ill and died from bromide poisoning. The Bromo-Quinine bottles and Miles Nervine bottles were everywhere in her home along with an alarming number of antacids advertised on television. This prompted me to ask questions of medical doctors and a pharmacist where I learned that this is a growing problem because of drug interaction. Patients do not regard many of these drugs as medicine and may forget to tell the physician that they are taking them.

To date I have not received the copy of "Handbook of Nonprescription Drugs" that I wrote about as a result of this course but am looking forward to having it.

Mrs. Best's discussion of laxatives reminded me of the days when I worked on a small hospital general medical floor many years ago. The Nun in charge of the floor would have so many requests for laxatives that she would observe that "If people worried about their souls as much as they worry about their bowels, they would all go to heaven."

Mrs. Best mentioned that she was going to get more information out to us that she has misplaced; I would be interested in the information she said she had concerning antacids.

Much of what I heard that day was not new but it served to refresh my memory and stimulate further study of drug interactions.

- 2) The workshop helped me be constantly aware of interactions and side actions of over the counter drugs in daily patient care.

We are also presenting the information learned at our next professional nurses meeting at Bethany.

I have also had several occasions since the workshop to advise relatives and friends in use of OCD.

I enjoyed the course and found the information on the drugs we discussed to be of help in my contacts with family, friends and relatives especially in the abuse of aspirin.

I would have preferred the afternoon session (sic) to be a continuation of the morning session (sic) with more drug information.

- 3) Due to the diverse nature of my role as an R.N. at Sheboygan County Hospital, the OTC drug seminar has proved to be valuable.

Because we treat not only the short term illnesses, but also those of a chronic nature we see many different areas of possible drug interaction--namely the aspirin, laxative, alcohol, oral insulin, and antihistamine combinations. I have brought to the attention of the physician many outdated and misused laxative orders, and substituted tylenol in cases where aspirin was not the drug of choice (e.g. ulcer pts. - gastritis, etc.)

I have also utilized my information in a health teaching area. We have alcoholics who are on oral insulins. They and their families are surprised to learn of the precautions and effects that occur when above 2 are combined.

Last but not least I am benefiting from this seminar in my role as a mother and neighborly advisor.

I feel my time was well spent and am looking forward to future seminars.

- 4) My working days do not begin until the Ripon College Student Health Service opens at the end of August.

However, I believe I will be much more comfortable and self-confident when advising students in the use of the "over the counter drugs" that we may dispense.

I think one of the most important parts of my job is teaching the student to have the same respect for drugs that I have.

- 5) In June I attended the workshop you conducted on over-the-counter drugs. This is a statement of impact the course has had on me.

Since I work in surgery I have little patient contact in relation to drugs. However, the course has been useful to me as I apply what we learned to myself and my family. For example, we no longer take aspirin or drugs containing aspirin for minor ailments.

I do not feel, however, that the workshop was worth the nine dollar fee. It seemed poorly organized.

- 6) Working in a nursing home, as I do, I administer many of the over-the-counter drugs everyday that we considered in this course. In gaining more knowledge of the effects, interactions with other drugs, and precautions in giving these medications I know that I am administering them much more safely and more effectively than before I took the course.

Specifically, I now take greater care to give milk or other food when administering aspirin. In looking this material over again I now remember that a resident of the nursing home does drink alcohol occasionally, and is a diabetic requiring insulin. I now know how to advise this man concerning drinking alcoholic beverages. I can also think of several other specific drug combinations of the residents which I will have to discuss with their doctors.

Of perhaps greater value is the fact that I am now more motivated to look into the effects, interactions, and precautions to be taken with over the counter drugs, and the material and bibliographies I received will be

valuable reference material for many years. This course was only the beginning of the study I should do on drug interactions. I can see that I have much more home work to do, and then discussing to do with the doctors with whom I work.

- 7) In response to the June 20th workshop: The one day session proved to be extremely interesting but only an introduction to a broad field. I sincerely hope there will be more response on this field.

The session alerted me to several interactions which are already present, in the nursing home, in which I am employed. These are hopefully, going to gradually be eliminated in the near future. The physician doesn't always admit to these, or is totally unaware.

I am more aware of the ingredients when purchasing a non-prescription medication--that label is all important. With this knowledge, I hope to be able to guide my family's usage of same.

The review of non-prescription medications--the four fields briefly discussed again brought further questions regarding different trade name medications and their usages. These were mostly answered at this session.

In closing--hope this is a preview of more to come.

- 8) Since I have completed the course "Uses and Misuses of Over-the-Counter Drugs" I have become more aware of the number of persons using them. The most common drug used seems to be aspirin or Bufferin. The following experiences are ways which I have been able to make some changes in habits of my friends and relatives.

After returning from the class, my neighbor came over to ask me about the course. I related some of the effects of aspirin in relation to lack of side effects of drugs which contain only acetaminophen. She has since switched to Tylenol.

A friend of ours was returning home from work one day. I was outside and he asked if I knew what he could take for the flu. I suggested Kaopectate and Tylenol, explaining lack of gastric distress with Tylenol unlike ASA. This recommendation did help him and he also has switched to Tylenol.

Possibly the most impact I have had was in our own family. My husband has had gastric problems and was taking aspirin. After taking the course I was able to show him written facts about ASA, which I had been aware of for some time but unable to transmit to him. I have now noticed that he buys Tylenol or ASA and Maalox.

Another interest I derived from the course was the information of diet medications like Ayds and Slim Mints. I hope to delve into this further as many of my friends are fad-diet persons as well as many of my patients.

- 9) I have been able to relate OTC drugs within my family and friends, but have not been able to coordinate it too effectively in my professional duties as a nursing assistant instructor.

This workshop was interesting but I felt too much emphasis was placed on aspirin and not commonly used drugs. Also I felt the time spent in group discussion could have been used to better advantage in instructor discussion of other drug interactions.

I felt Mrs. Best was very well qualified, and did a very effective job in creating and keeping our interest.

I hope nurses have more opportunities for workshops such as these.

- 10) The drug related program concerning O.T.C. preparations certainly was helpful to me, now actively engaged in nursing but trained almost 30 years ago.

Being employed part time in a nursing home I do have frequent contact with many, many of these prescription, non-prescription drug users. The infirm, elderly often have their pet "sure-fire" products to cure anything by rub-on, rub-in, inhale, drop, EENT, or swallow.

Since this lecture I've been aware of the combinations and their adverse reactions, often one nullifying (sic) the value of the other.

I have helped doctors realize this and substitute Tylenol for Bufferin when ulcers and diabetes are involved. Coumadin users are cautioned against ASA. The

nursing home staff find themselves doling out drinks of high alcohol content, beer, etc. especially at h.s. Their favorite liquor taken previously in large doses are being lessened gradually or eliminated entirely, when a combination with their prescribed medication deems this necessary. Our most frequent and numerous patient incidence would involve cardiac disease and diabetes mellitus.

The action graph of various ASA tablets, PAC, Buff., Anacin, etc. answered many questions posed to us by patients and other acquaintances who think nurses should know ALL!

My long standing belief that cold preps., and anti-histamines were never satisfactory self-medications were satisfactorily substantiated.

The lecturer was well informed and precise but I felt that a continuous informative lecture would have been more effective than the smaller "buzz" sessions.

I do hope there will be more of these seminars on drugs and thank you for the opportunity to learn of the current problems and get the current answers.

- 11) After having attended this workshop, I am able to advise patients, family and friends to use over-the-counter drugs more wisely. I am more aware of discussion going on around me from people regarding the use of aspirin, laxatives, antacids, etc. and I am compelled to offer suggestions. On many occasions I have been given the opportunity to suggest the use of Tylenol instead of plain aspirin or the use of the use of an antacid with plain aspirin, why not to use Bicarbonate of Soda, not to use antihistamines longer than five days, and to watch that my patients who are on anticoagulant therapy are not inadvertently (sic) given aspirin. These are just a few of the opportunities I have had.

More importantly, I can understand the reasons why I buy a particular product for my family because I know now what I am looking for in that product and I can save money in the process.

The workshop was excellent and I benefited greatly by attending. Mrs. Best is an extremely dynamic person and the handouts we received can be used in many ways. As a nurse who works with many medications nearly every day, it is important to be aware of certain drug interactions that can occur.

- 12) An informative seminar; more awareness and caution regarding dispensation of over the counter drugs and the possible interactions which might occur. Pertinent literature pertaining to the course now being dispensed to all wards.
- 13) Regarding the workshop on the "Uses and Misuses of Over-the Counter Drugs." I feel it was fairly well presented and the material covered will be useful, but the two tests and group discussion could have been eliminated and more time spent on other medications which are used frequently.

At present I'm not in a situation where I am working with medications but I feel I can use the knowledge gained in my own family.

- 14) Because of my present position as an instructor, and because I am spending the summer unemployed, there has been no impact on patient care as a result of the course entitled "Uses and Misuses of Over-the-Counter Drugs." However, I am sure what I learned about aspirin will be of use in my associations in the future.

I'd like to add here that, in my opinion, the presentation of the material by Mrs. Best was, at the most, mediocre to poor. I can't help questioning if it wouldn't have been more profitable in time and money to read the hand-outs and skip the in-class participation. This was my first enrollment in a class of this nature and may quite be my last, especially if it is an indication of such offerings by UWEX.

- 15) I was interested in attending the workshop because as a hospital supervisor, one of my main responsibilities is to dispense drugs from the pharmacy for in-patients and

emergency drugs for the out-patient department during night hours. This responsibility frightens me at times--very often I'm afraid of making a mistake.

Therefore I try to seek all the information I can on drugs; their actions and interactions.

After attending the workshop, I feel that I can advise and dispense the drugs discussed with more knowledge and reassurance.

Not only has this workshop helped me in the hospital; but also with my family and neighborhood, for many seek advice from me about drugs.

I would like to attend more workshops like this one. There are many more drugs I would like more knowledge about. Mrs. Best is excellent.

Thank you for the opportunity to attend.

- 16) In taking care of patients at the hospital I have instructed the patients concerning laxatives, e.g. take at least a glass of water with their MOM.

The handout sheet on drug interaction made me much more aware of drugs that are not compatible (sic). I find myself referring to the PDR more frequently. This sheet has caused much frustration because I feel this is what we could have spent our time on instead of wasting it on interpreting TV commercials or the small discussion groups that was a repeat of the morning lecture and a "can you top this" contest by the majority of the nurses relative (to) their past experiences.

I feel that the workshop was keyed very low for our profession and I will think twice before I spend the money and time to attend another one. It does not seem of much value to have spent 6 hours in class that I could have obtained as much from just having the handouts mailed to me.

- 17) The day after our seminar my neighbor lady called me over to look at her leg. Approximately ½ hour before, she had bumped her left thigh on a wash tub. A hematoma the size of a large cantaloupe had formed. It

was warm and hard to the touch. While waiting for her doctor to return her call, I put an ice pack on her leg. We talked about aspirin as there was some discomfort.

She has high blood pressure I found out as I talked with her. Explained that 'tylenol' might be better for her to take since the aspirin would be hindering her B/P medication. Also the aspirin would prevent the hematoma from reabsorbing. Learned that her husband had had a coronary two years previously. Explained how his taking of aspirin, especially if he is on anticoagulants, would stop the action of his medication.

Her hematoma took one week to partially reabsorb causing a bruise (sic) from her midcalf to hip. It had to be incised and drained three times. As of today healing nicely.

- 18) I'm writing to tell you I enjoyed the meeting on June 20 on Over-the-Counter Drugs. Was good to see so many RN's interested, however, the group was a little too large to lead to good discussions. The material could've been presented to better advantage, I feel, had she not "forgotten" the materials for the over-head projector. I did learn some things, but not as much as I had anticipated. Much of it was repetition and more time could've been spent on antacids (barely touched on) and laxatives.

The course did reveal even more to me how many drugs our physicians are ordering in the hospital (I'm on a medical floor) are actually counteracting each other. It will remind me to be on the alert for symptoms which could actually be drug reactions or side effects, report them to the MD, and also constantly remind my subordinates to be alert to any such complaints our patients may have. However, besides this, I did again realize how wonderful drugs can be in relieving pain, constipation, or whatever when given with exact dosage, requirement, and order of a physician with the individual's specific welfare in mind. Also how important it is for me, a Head Nurse, to follow the explicit order of a physician for his patient with accuracy and constant vigil of pts. condition thru co-workers, and subordinates, and report any and all signs of toxicity or withdrawal, or any unusual complaints to him immediately. For people

being discharged home from our unit I will now more than ever before teach them too the importance of following the exact prescription orders and the necessity of being aware of any untoward signs of toxicity, etc. with simple language as to what to watch out for, such as: gastric upset and bleeding from aspirin; pink urine, nose bleed, etc. from anticoagulants; nausea, bradycardia from Digoxin, to name a few. The good nutrition and proper exercise to limit need for laxatives will also be stressed for my elderly patients. To the middle-aged the danger of sleeping medicine such as Somnex will be taught, the young mother will again be told of possible harmful prolonged use of "tranquilizers" can do. All in all, I feel the course taught me that I have a greater responsibility to my pts., but also anyone I come in contact with to have proper regard for drugs used by them. It will be a help to the MD, the pharmacist, and most of all to the individual himself if all RN's get behind this concept-- and above all, "practice what they preach."

APPENDIX 14

POST-HOC EVALUATION STATEMENTS:

NURSES (GROUP II)

APPENDIX 14

NURSES' POST HOC STATEMENTS:
EVALUATIONS OF COURSE

Group II

- 1) First let me state that I thoroughly appreciated and enjoyed the Uses and Misuses of Over the Counter Drugs Course. I haven't worked for over two years and although I read two professional journals hadn't realized how stale I'd become. My statement of use of the knowledge will have to come from two experiences I had with neighbors after the course. Eventually I hope to use more of the information on a semi-teaching role as a volunteer in a local rescue squad. I hope to be able to pass along the information on drug interactions with food and other drugs to those with whom we come in contact.

Shortly after the course I heard of a church member who had fallen and while not seriously hurt was in pain from contusions and muscle strains. While visiting her I learned she was allergic to aspirin and refused to visit a doctor. After urging her to see a physician I told her about tylenol. She thought there was nothing she could use to relieve her discomfort.

The other incident concerns a vegetarian neighbor who is also on thyroid. We were discussing medications when I showed her a list of vegetables which interact with her thyroid. Some of these were ones she used frequently, but are now eliminated from her diet.

I think greater emphasis should be put on food-drug interactions in the physicians office, either by the MD or the office nurse. Our son was diagnosed as asthmatic last spring and nothing was mentioned about drug or food interactions when he was given his medication. From now on I will advise relatives and friends to ask about such interactions when they receive medication.

I would appreciate having more one day courses in or close to the Green Bay area, and would especially be interested in courses on EKG reading with cardiac medications and cardiac-pulmonary resuscitation.

- 2) I am in Public Health Nursing so it is impossible to determine the impact the course will have on patient care this early but I feel that for my own personal use it was extremely valuable. I thought the information was presented very systematically and I am glad to have the drug interaction charts that were in the packet. Thank you for a most interesting day.
- 3) The Workshop on over the counter drugs has made me more aware of some of the interactions of drugs enabling pt. education as well as being able to share this with family, friends and neighbors as the questions arise. My own benefit is most important.
- 4) I found the course most helpful both in my position as a charge nurse and as a homemaker. In a small hospital in a small community I've found that the doctors seem to leave a lot of responsibility to the charge nurses and medical nurses, particularly in dealing with medications - allergic reactions and interactions.

I find myself much more aware of the interaction of some drugs with foods and have been able to check with the dietary department on several occasions regarding patients' diets.

The information on some possible interactions of prescription drugs with over-the-counter drugs and food has been found to be particularly helpful in dealing with out-patients and emergency room problems. It has made me aware of the necessity of questioning patients more thoroughly regarding prescription medications and/or over the counter drugs they have been taking.

I have also found many opportunities to educate patients who inquire about aspirins etc. they see advertised on television.

I feel through this course I've gained an insight and renewed interest in an area of nursing that is often neglected or overlooked completely. I also feel that through my renewed interest I've encouraged many of my co-workers along the same lines.

- 5) I believe that the impact of this course was first to myself. I was unaware of many of the interactions of drugs & foods. I have since been able to inform several people in the neighborhood who are on drugs of the danger of some interactions.

I also used some of the information as an on the ward class to my aides and the urgency of asking patients about some allergies and type of drugs patients are taking. As a night nurse in pediatrics I'm not in as much contact with parents as other shifts but whenever the opportunity presents itself I try to stress to parents the need for care in using over-the-counter drugs indiscriminately for their children.

- 6) The workshop on uses and misuses of over-the-counter drugs has proven useful in numerous ways in the counseling of personnel as part of the duties of the personnel health nurse.

Last week one of our nurses aides was sent to the office because she had a cold for the past week, was having stomach pains, & during the nite had diarrhea. The aide stated she had been taking aspirin, a cold remedy purchased at the drugstore & 'something' a friend had advised for diarrhea. During the conversation she also stated she thought she was pregnant.

I advised her to see her doctor immediately, to discontinue taking the medications, & we talked regarding taking drugs from friends, and the harm that may come from taking over-the-counter drugs, especially at this time.

The packet containing literature regarding interaction of drugs with aspirin, prescription drugs, etc., has proven useful & will continue to do so in the future.

I talked to a nurse recently diagnosed as a diabetic. The sugar-free drug preparations proved helpful as well as interesting.

- 7) The information given at this workshop will be a useful guide in the administering of medicines in the light of drug reaction and in the education of new admissions who usually bring a score of home remedies in with them.
- 8) Dec. 7, 1973 I attended a workshop on Uses and Misuses of over the Counter Drugs.

I was made aware of some drugs which we are not using in our area and also many interactions of some drugs we are using.

I am working in an extended care facility and many of our patients come from home or have relatives bring meds they were taking at home and now I can be better informed when telling relatives about meds they are not to be taking and explaining they should only take medication perscribed (sic) by their Doctor.

- 9) As a result of this course I have become more aware of the frequency these drugs are prescribed. I feel better qualified to explain to my patients the desirable as well as the undesirable effects these drugs have on the system. I have given an In-Service to our nursing staff on Over-the-Counter Drugs. I was amazed at how frequently one of our physicians orders aspirin.

Interaction of some drugs with food and interaction of drugs with aspirin has been discussed with our physicians and many found to be incompatible. I might add Marie Best was outstanding.

- 10) My work in a Home Nursing Program involves patient contact in the home setting. I found the information obtained at this workshop applicable and helpful in situations often encountered. If the workshop is offered in this area again--I will recommend participation to fellow workers so they too can benefit from it. Areas in which I felt the course influenced an impact in my care of patients include:

- (1) Stressing the advice of "Read the Label" of all medications.
- (2) Periodic review of all medications patients are taking.
- (3) Development of an increased awareness of interactions of drugs with foods and other drugs--
- (4) Discourage tendencies of some patients in the area of self-medication--because of factors affecting the patients response to drugs.

11) As a nurse with a B.S.N. who has not worked for nearly 7 years and will be returning to full time duty on a medical-surgical floor of Appleton Memorial Hospital in January, I found this interesting drug seminar useful in many ways. First, it stimulated me to think in terms of nursing and medications again. The tests showed in what areas I am weak, but I was also encouraged by the fact that I did as well as, if not better than, many who have been working for years--so I'm not as rusty as I thought! The seminar has already changed my thinking and personal buying habits of O-T-C drugs and a diabetic neighbor has found the list of sugar-free O-T-C drugs very useful. When I return to work, I will be especially aware of the importance of checking patients "personal medical arsenals" that they have a tendency to insist on keeping with them.

Mrs. Best is a fine instructor, and the day was a most enjoyable one. My only suggestion is that the case studies might have been more useful had they been placed earlier in the day. Would Mrs. Best be willing to do a series on various types of prescription drugs and also one on cosmetics?

12) I was able to convince an outpatient who had been refusing to take aspirin for frequent headaches (sinus related) because of stomach upset that acetaminophen 325 mg. would relieve his headache without upsetting his stomach and was available under the name Tylenol. I informed his physician of what I had said and he approved, remarking that the patient had never mentioned that ASA bothered him. The doctor just assumed the man was using aspirin as suggested, not that he was suffering the headache needlessly.

- (13) The Over-the-Counter Drug inservice given by Marie Best was informative and I feel the information derived will help me; especially when patients inquire about some of the non-prescription drugs. The benefits gained from taking some of them, most assuredly, are exaggerated.

In my work, as a home care nurse, I often discover that patients are taking over-the-counter medications in addition to the prescribed ones and sometimes are taking several medications for a specific ailment thereby getting an overdose.

In my progress report to the patient's physician, all drugs taken are listed, dosage, and how often taken. We do not prescribe or discontinue any drug without the physician's consent. Our responsibility, however, is chiefly what drug is being taken and to know what side effects can be expected. Also, we can make sure the family is completely knowledgeable on exactly how drug is to be taken and whether or not it should be refilled or only taken as necessary.

- 14) Since attending the course on the uses and misuses of over the counter drugs, I have been more aware of the possible interactions which can occur between these drugs and prescription drugs. Many patients at the hospital are on medications which do interact and react with one another and I can now better understand the possible consequences as there can be interferences, and others. I'm also better prepared to give advice to others, outside the hospital setting, on over-the-counter drugs and the information they should be made aware of before purchasing anything over-the-counter.

Marie Best is an interesting and informative speaker and I feel that this one day course was very helpful to me.

- 15) The course presented December 7, 1973 on the Uses and Misuses of Over-the-Counter Drugs has been of tremendous help to me. I have become extremely conscious of the interactions of all of the medications we are using in our Extended Care Facility.

I've had several discussions with our pharmacist about various combinations of drugs prescribed. As a result he has been able to make some helpful suggestions--for example in changing the times of administration when a patient is receiving both an antacid and tetracycline.

The class was most interestingly presented, and we are very grateful for the opportunity to participate.

- 16) As head nurse on a childrens (sic) I used the knowledge gained in the drug seminar of Dec. 7th for staffing meetings and inservice. I also used the knowledge for family teaching of children on antibiotics.

I feel the material given was very helpful for all the people I talked with about over-the-counter drugs.

- 17) In regards to the workshop we attended in December on OVER-THE-COUNTER drugs, I will submit this statement: I feel we were able to discourage people from bringing O.T.C. drugs into the home because we had a more basic reasoning power to inform some of the potential dangers they have to the residents and their families. But I did feel the course could have been completed in half the time so it was a long drawn out affair and that my money was ill-spent.

- 18) Due to the fact that I was negligent in sending in my paper on the "Teenager and the Nurse" of last April, I felt I must send my statement of "Uses and Misuses of Over the Counter Drugs" as soon as possible. I can't afford to lose any more C.E.H. The first thing I did as a result of the workshop was to clean out my medicine cabinet at home. I never realized that while I was sitting in that workshop that my medicine cabinet at home was a potential danger to my whole household. I had to through (sic) out a whole box full of old and outdated drugs. Some laxatives that went back to the year one. No one can even remember where they came from. I know that is a sin for a nurse. I find myself questioning at work the request for aspirin. I find myself reading more lables (sic) than I realized.

Yes I think the workshop did have a impact (sic) on my nursing. It has made me stop and think before giving out something as simple as a (sic) aspirin (sic).

- 19) The Over-the-Counter Drugs Continuing Education was a learning experience for me. I had not paid too much attention to the impact of Over-the-Counter drugs. The Shawno County Nursing Service uses the PDR to check all prescribed drugs for usage, dosage, actions, indications, counter-indications and warnings. This learning experience has made me aware of interaction that may occur with over-the-counter drugs and foods.

The impact of advertising of over-the-counter drugs makes me wonder if something shouldn't be done about advertising drugs on television because of harmful use as was done with cigarettes.

- 20) I attended the one day workshop on the uses and mis-uses of over the counter drugs at the U. W. Deckner Ave. building, Green Bay on Dec. 7, 1973. I found the course very useful and informative, and also am now much more at ease in explaining to the patient the interaction some O.T.C. drugs have with some prescribed medications and some food. Even pouring a simple dose of Maalox now leaves an impact.
- 21) I didn't feel that the course on the uses and mis-uses of over the counter drugs did much for me. It wasn't worth the \$9 plus the cost of lunch. Three pages in the folder was given to the speaker's credentials. All the material that she skimmed over could not be absorbed that readily. Pharmacology is a subject that for me and many others requires a lot of study. Mrs. Best did make an impression on me on how dangerous aspirin is. I'm cautioning patients on its dangers more so than before. I have found the material in the folder very valuable. Studied some of it at a later date. I felt had we spent our lunch hour studying rather than eating we might have done better on the second test and also taken more home that day.

- 22) Since attending the OTC Drug workshop, I have found myself becoming much more aware of the possible interactions of drugs. Besides checking patients' prescribed drugs, I am careful to note what OTC drugs they have been taking along with the Rx.

On one occasion when I was making a routine check on an absentee employee for the City Health Department, I found a man taking aspirin for headaches when he had a history of ulcers. After it was explained to him that aspirin could aggravate that condition by causing possible bleeding and gastritis, he seemed grateful to have Tylenol or Temptra suggested as alternatives to use instead of aspirin.

- 23) To this point it is rather difficult to evaluate the full impact I have had on the individual client thus far from the continuing education course on "Uses and Misuses of Over-the-Counter Drugs." As I teach in a diploma school of nursing, my greatest impact is in teaching the students to teach the clients and evaluating their ability to do so.

This last month I have developed an independent study packet which includes a sub-unit in which students will lead a seminar on non-prescription drugs. They will be visiting drug stores, grocery stores, etc., to assess some of the areas in which over-the-counter drugs abound. Some of the information I received during the continuing education course will be included in the independent study packet. The intention of this student lead seminar is to make the students aware of the profound effects over-the-counter drugs have on the entire population. I hope it will also assist them in teaching clients about the safe use of all drugs.

Should you need more elaborate verification of my impact on client care, please write and ask.

- 24) As a result of this course I feel I have gained valuable knowledge which I have been able to pass on to my patients in numerous ways.

First of all this knowledge can be given to my patients by education of them regarding drugs and because I work in an ECF, also educating their families.

Secondly, by having additional information about medications one is able to observe the patient more intelligently for desirable as well as undesirable effects. The nurse must know the expected side reactions so that she can make intelligent decisions about giving or withholding of a dose.

Thirdly, in order to be a knowledgeable observer the nurse must know the relationship of the prescribed drug to the total therapeutic goal in the care of each patient. She should be able to assess alterations mediated by the drugs in the patient's symptoms, his vital signs, his hour by hour behavior, and she should be able to interpret laboratory reports and other evaluations made of patients progress as that she recognizes clues that indicate the drug's effects on patients.

In summarizing I feel I gained much worthwhile knowledge beneficial to myself and of utmost importance beneficial to my patient.

- 25) The seminar on Uses and Misuses of Over the Counter Drugs was a refresher for me as far as terminology was concerned. It was also very informative as to the interaction of drugs and I have been more conscientious about the use of aspirin. I am able to teach my employees more about the precautions necessary with indiscriminate use of aspirin particularly. I work with a large number of people, so have a fertile area for teaching good health habits.
- 26) Since the workshop on "Uses and Misuses of OTC Drugs," I have had little opportunity to actually interject my new awareness with patient care. This may be due to the fact that my usual work area is Labor and Delivery.

However, I was able to share my newly gained knowledge of drug interaction, more specifically the interaction

of dairy products with tetracycline. My daughter is seeing a dermatologist who prescribed tetracycline, but did not mention the interaction.

I also was able to share my new knowledge with an individual who was taking a prescribed diuretic. I told her about the interaction with licorice.

The workshop has made me aware of the widespread indiscriminate uses and misuses of over-the-counter drugs. I feel certain that this will be beneficial to me in future patient care.

- 27) I am the only R.N. employed by an M.D. engaged in Family Practice. Therefore, I have daily personal contact with many patients and am also called upon to answer many questions--many of which are drug-related--both OTC and prescription.

The workshop on OTC drugs was especially helpful to me because many people do ask if they can combine various drugs. I am able to keep my information on prescription drugs current because of personal contact and information distributed by drug detail men and the P.D.R.

My first day back in the office I had the experience of taking a history on a new patient--an elderly man with epigastric symptoms, suggestive of an ulcer. After the doctor had made his exam, prescribed medication and ordered GI x-rays and strict ulcer diet, I was asked by the patient's wife to explain the diet and medications. She also wanted to know what to do about the APC & Codeine and aspirin he was taking for an orthopedic problem. I explained the reasons for discontinuing the use of these drugs--especially until after the X-ray results come in and advised using Tylenol and the antacid which had been prescribed. X-rays did confirm the presence of a gastric ulcer. I did continue to assist the couple with diet and medication advice for the next four weeks and upon repeat X-ray the ulcer had healed. Another patient I had occasion to advise recently was a 65 yr. old lady with severe rheumatoid arthritis who had a total hip replacement last fall. She had relied heavily on aspirin and Darvon Compound 65 mg. for years. Now

she is complaining of a great deal of bruising and some epigastric distress. We tried Tylenol, but she developed generalized itching, so have stopped the Tylenol and have returned to Darvon Cmpd 65 mg. with an antacid on a trial basis.

The workshop has helped me to be more alert and conscientious about explaining to patients the importance of not giving milk with tetracycline, of continuing to take aspirin in the presence of fever even though they are taking an antibiotic. It has been helpful to have a list of sugar-free drug preparations which the diabetic patients can safely use--without having to spend time going through the PDR to check on ingredients.

I felt that it was a day very well spent and filled with information that I am using everyday in my field of office nursing---and Marie Best was an exciting, well-informed leader.

- 28) Very helpful in the administering of drugs as to their interactions.

Much more aware of drugs being brought in by members of the family for new admissions.

Helpful for preparing material for Nurses Inservice meetings within the facility.

- 29) I have found the material and information very useful in my work in community nursing. Many of the persons I see are elderly and have been recently hospitalized. As I review their medications with them, I feel I can discuss the effects more intelligently and can counsel them against using certain over-the-counter drugs while taking prescription drugs. Many of these people are on diuretics and blood thinners. I have used the materials to re-inforce information I have given them. I have found these materials a valuable reference. The interaction of certain drugs with certain foods was an area that I wasn't very knowledgeable prior to the seminar.

I have shared the materials with the other staff nurses and have made copies for their personal use. I feel the day was well spent and it stimulated my interest in reading the labels on all over-the-counter drugs-- particularly the ones that are new on the market. I have found that even some of the familiar ones have changed content since I had last read the label.

- 30) As a result of the course "Uses and Misuses of Over the Counter Drugs" I have become more conscious of the interactions drugs may have on each other and on the influences they may have on different lab tests being performed for patients in the hospital environment. Instead of handing out A.S.A. for a headache, I first ask myself "Is this a patient having kidney or thyroid tests being performed?, is this a heart patient whose care could be affected by the Na retention characteristics of this drug, is this patient a diabetic on oral hypoglycemic agents, does this patient have ulcerative symptoms, or is he on anti-coagulants?" If the answer is yes to any of these questions I consult with the patient's Doctor. If the physician orders an A.S.A. containing drug I question him as to whether he is concerned about its effects with any of these specific conditions. If he still says give the A.S.A., I observe the patient to see if there is any noticeable ill-effect. If there is, then I call it to the physician's attention.

This seminar has contributed knowledge useful in patient teaching. I now inform my hemorrhoidectomy patients leaving the hospital on laxatives to return to normal bowel habits as soon as feasible because of the bowels ability to become dependent. Also that they should discontinue mineral oil as soon as they can because of its ability to prevent absorption of fat soluble vitamins.

Many of the RN's I work with were surprised Milk of Mag., Fleets Phospho-soda, etc. could cause electrolyte imbalance. We now instruct patients to drink a glass of water with these laxatives. This type of knowledge can also be used in patient teaching, especially with patients one knows frequently use these types of laxatives.

I have discussed with my head nurse the changing of time schedule for the administration of tetracycline. We previously gave it on regular q.i.d. schedule but now we give it between meals since its absorption can be affected by food.

Relatives and friends can sometimes be considered our patients because they rely on us for advise. (sic) I've had occasion recently to answer questions like "How do you know what kind of cough medicine to buy? There are so many kinds!" A reminder of the expectorant, suppressive, and decongestant characteristics are helpful in this case. Of course, here again one must be keen in mind, is this person hypertensive or diabetic?

I have always read labels more than the average person, I suppose, mostly because of my medical background. However, after one is familiar with a product you don't check it every time you grab for that product. I was very surprised to hear that Anacin contained 7 1/2 gr. of A.S.A. rather than the usual 5 gr. I think changing ingredients but keeping the same identity of a product is hazardous and should be illegal.

- 31) Working in a University Health Service without the presence of a doctor, I do dispense many non-prescription drugs, which have been approved by the local internist. Hence, I expected this workshop to be of much value. The detailed explanation of Aspirin and drug interaction was good as was the review of term for uses of drugs in the test. I do wish, however, that more stress was placed on drug and food interaction, and had I read over that sheet during lunch would have had more accurate answers on the test, I am sure. I have been studying the information given us, and find I am much more aware of the interactions on non-prescription drugs with other medication as well as with foods and keep this in mind as I work with students and their medical problems.

I am very much interested in attending more such workshops and hopefully, they will continue to have some held on the Green Bay campus.

- 32) As a result of my attendance at the workshop on Uses and Misuses of Over-the-Counter Drugs I have been interested in reading and studying the material in the handouts that were in the folder. I have also spent some time reading about drugs in my Merck Manual and the Physicians Desk Reference especially for formulation and generic name. I can appreciate how valuable a course in drug composition is to the nurses today. I feel wholeheartedly the truth in the statement of the Nursing Education booklet by Florence Nightingale, "Let us never consider ourselves finished nurses..... We must be learning all our lives."

Because of the workshop I decided to check my own medicine cabinet, to re-examine the labeling, content, storage and age of both the prescription and O-T-C drugs. This workshop has made me more aware of good labeling of all products.

My co-workers and I also had a conversation about drug labeling, interactions with drugs, foods and alcohol, and also the use of aspirin and Tylenol. I expect to be able to use some of this information with my students in the course of this school year.

I have again tried to encourage my aunt not to depend so much on the use of antacids and laxatives. The interaction of antihypertensives with certain drugs and foods will be useful to me.

This was a good workshop and I feel it was a benefit to me. Nurses do need more information on drugs. In line with the statement on 'Drug Information Needs of Nurses' we will need more such opportunities.

- 33) This is being submitted to meet the requirements for 6 CEH for active participation in the course "Uses and Misuses of Over-the-Counter Drugs" held on December 9, 1973 at UW - Green Bay.

As of this date I have not had the opportunity to deal with patients in patient care (public health nurse supervisor).

However, I had the opportunity of dealing with a personal friend who had a misconception regarding the

kinds of aspirin on the market and their intended use. At that particular time I was able to convince him of the value of aspirin for its intended purpose although I am not so sure my "preaching" will carry over into future situations for him.

However, I felt the course was a good review and re-confirmed much of what I already knew. Therefore, I will now feel more secure in my future dealings with individuals when the opportunity presents itself.

34) I think the course had is that I am much more aware of the effects and affects of ASA, Tylenol and laxatives. Nurses are freely giving these medications without an order as doctors have told us they don't want to be bothered with calls for laxatives or ASA. "Just give the patient what he wants" is the answer given by most doctors. Not one patient that I have cared for since taking the course and becoming aware of the reasons, knows anything about Tylenol and many of these patients are diabetics. Many of the heart patients are on anti-coagulants and eat lots of green leafy vegetables. I feel (sic) I learned a great deal by attending the workshop and that I will continue to impart information to other nurses at work and nurse friends who are not working, and to my patients.

35) While I do not give actual patient care, I feel that this workshop has better equipped me to assist and answer the questions of my students and also of my friends, neighbors and family, including many nurses, don't really know what they're taking but will use an OTC drug on the advice of a friend or a TV commercial, without realizing what the drug may do to them or how it may react with another drug or food that they may be taking.

Furthermore, it's possible that even a good physician doesn't explain the reasons for not mixing certain drugs in specific cases. A good example to me is that of my husband, who has a duodenal ulcer. His physician, a reputable internist, gave him a prescription for a "headache capsule" which he was to use in place of aspirin, but didn't explain why. Being of a very frugal nature, my husband decided aspirin works just

as well as the fancy capsule and doesn't cost nearly as much. While I had heard about aspirin causing a little bleeding, I didn't have enough knowledge about the situation to be able to convince him to switch. Since the workshop, I've been able to understand and explain to him that aspirin can cause bleeding of the GI tract and gastritis, and is therefore contraindicated, and he has since changed to Tylenol. Another example is my brother, who has had open heart surgery and still takes several prescribed medications, including coumarin--I am able to explain to him why he should avoid aspirin, and to carefully watch the labels of his various medications.

Students frequently ask advice on what to take for headache, sore throat, or dysmenorrhea, but I think one of the more important things for people to know is that the various "cold remedies" may dry up some of the secretions but they do not kill the virus, and I still feel the person with a cold should stay home and not "share" it, contrary to what some TV commercials would have one believe.

I feel this workshop has given me a broader insight into the OTC drugs that are available, and how they should or should not be used (and labeled). Whatever advice I may be asked to give students or to others, I feel more confident about the correctness of the information I give than I did prior to attending the workshop.

I'd like to take this opportunity to say I think the speaker was excellent and the workshop was handled very well. My only criticism is that there wasn't enough time--our speaker had such a wealth of information, it seemed like we only scratched the surface.

- 36) The impact of this course gave me the incentive to counsel an aid (sic) on my service who has a cardiac condition. I didcussed (sic) with him his excessive use of ASA in light of the fact that he is on coumadin. I also discouraged his excessive use of bi carb.

When requesting a prn med for minor discomforts I have encouraged the nurses on my service to ask the MD to order Tylenol rather than ASA.

A brief resume of the workshop and some of the study guides were given by me to our inservice personnel.

- 37&
38) We both found the course very informative. It has made us very aware that aspirin is not the harmless drug that we and so many others think it is.

We both have been a little braver at questioning some of the medications the Doctors order and they seem pleased. Some of the terminology went over our heads as we are just getting back into active nursing.

We would like to see this course repeated so that L.P.N.'s could be included.

- 39) The possibilities for teaching involved in this drug seminar were endless. Our society quite frequently tends to self-prescribe medication on a large scale, probably due to the rising costs of professional medical help and to social pressures which do not give us the time to wait in an office to see a physician. Advertisements and commercials make the over-the-counter drugs seem appealing. They glorify the good effects without touching on the side effects and precautions. I have been able to use the information gained from this seminar not only in patient teaching but also with students I am in contact with at school.

In the hospital situation I have stressed the benefits of Tylenol and the reasons why it is recommended especially for people with gastric problems. I have also been able to evaluate the needs of my patients for various types of laxatives and have discouraged dependency on them particularly for younger patients.

Students are frequently seeking remedies for cold symptoms and I have explained the precautions in taking any over-the-counter decongestant and the misuse and confusion of cough suppressants and expectorants. I also advocated Tylenol for an aspirin replacement.

This was an interesting and well presented seminar. I enjoyed the manner in which it was presented and found Mrs. Best a remarkable and well-versed speaker.

APPENDIX 15

OUTLINE OF COURSE: NURSES

USES AND MISUSES OF OVER-THE-COUNTER DRUGS
COURSE OUTLINE

I. Introductory Lecture

- A. Factors influencing drug response (Handout/discussion)
 - 1. Personal or Individual Characteristics
 - 2. Physiological and Physical
 - 3. The Drug
 - 4. Other factors

- B. The labeling of medications
 - 1. Prescription medications
 - 2. Non-prescription medications
 - a. Terminology
 - b. Important information
 - c. What's missing?
 - 3. The Physiology of Selected Symptoms
 - a. Pain
 - b. "The common cold"
 - c. Others

- C. The importance of Observation
 - 1. Drug Interactions
 - a. Types
 - b. Implications
 - 2. Side effects
 - 3. Adverse reactions

- D. Questions and Answers

II. Overview of nonprescription medications

- A. Analgesics
 - 1. Usefulness
 - 2. Prototypes
 - 3. Dissolution, Absorption, Action (Duration)
 - 4. Side effects, adverse reactions, interactions
 - 5. Discuss Handouts on aspirin interactions

- B. Antacids
 - 1. Usefulness
 - 2. Prototypes
 - 3. Factors affecting choice
 - 4. Interactions/side effects

- C. Laxatives
 - 1. Usefulness
 - 2. Prototypes
 - 3. Side effects, adverse reactions, interactions

- D. Cold Preparations
 - 1. Cough Preparations
 - a. Physiology of the cough
 - b. Differences between expectorant and antitussive
 - c. Exempt narcotics
 - d. Side effects, adverse reactions
 - 2. "Nasal Decongestants"
 - a. The physiology of the nasal mucose
 - b. Oral vs topical products
 - c. Important interactions
 - 3. Antihistamines
 - a. Fallacies
 - b. Interactions
 - c. Others
 - 4. Cold Tablets/capsules
 - a. Types
 - b. Reactions, actions, interactions
 - c. Effect of Advertising Media
 - d. Contraindications
 - 5. General Questions and Answers

III. Practice

- A. Small group discussions "Case studies" Analyzing Commercials
- B. Large group Discussions
- C. Questions and Answers

IV. More on Drug Interaction

- A. Distribute Remaining Handouts
- B. Discuss

V. Post Test

APPENDIX 16

HANDOUT: FACTORS MODIFYING DRUG RESPONSE

FACTORS MODIFYING DRUG RESPONSE

1. Personal or Individual Characteristics

a) Age

- infant
- child
- young adult - "middle" age
- aged

b) Body Weight

- very lean
- "normal" weight
- obese

c) Sex

- female
 - pregnant (?)
 - of child-bearing age (?)
 - during menopause
- male

d) Genetic Factors; Ethnicity

e) Milieu

2. Physiological and Physical

a) Physiologic condition

- #### b) Pathologic state
- other drugs (?)
 - nutrition factors
 - other illnesses

c) Tolerance

d) Allergies

e) Idiosyncrasies

3. The Drug

a) Administration of the drug

- 1) route of administration
- 2) time of administration

b) Absorption, distribution, elimination factors

- 1) rates
- 2) sites
- 3) factors affecting (i.e. increase, decrease. . .)

c) Physical characteristics of drug and drug product

- 1) solubility
- 2) formulation
- 3) stability
- 4) acidity or basicity

4. Other Factors

- a) Potency, strength
- b) Packaging of product
- c) Sterility
- d) Storage
- e) Integrity of product

APPENDIX 17

HANDOUT: INTERACTIONS OF DRUGS WITH ASPIRIN

INTERACTIONS OF DRUGS WITH ASPIRIN*

Note: The interactions of aspirin fall into seven general categories. The information which follows below also applies to "combination of ingredients" preparations which contain aspirin.

Category	Examples	Comments	Side Effects Interactions
1. Potentiation (either additive or synergistic)	<p>a) Aspirin, phenacetin, and caffeine mixtures as in Empirin Compound [®] PAC [®] APC, etc.</p> <p>b) Aspirin - phenylbutazone Aspirin - indomethacin</p> <p>c) Aspirin, other salicylates (alone or in combination with other drugs)</p>	<p>Justification: increased efficiency of pain relieving qualities; decreased toxicity from giving 1/2 doses of individual drugs.</p>	<p>Mental over-stimulation from caffeine (c) → stimulation of gastric secretion. --aspirin (a) → ulcerative lesions in gastric mucosa; decreases gastric motility. --combination C + A → potentiation of gastric toxicity</p> <p>Phenacetin: --no anti-inflammatory action; --more toxic than aspirin; --continuous use in large doses → risk of methemoglobinemia, hemolytic anemia and chronic nephropathy increases</p> <p>Aspirin has ulcerogenic effect; the R_x drugs irritate the GI mucosa; in combination, aspirin + either of the R_x drugs may intensify the ulceration</p> <p>--High doses often exacerbate peptic ulcer symptoms, GI hemorrhage and erosive gastritis</p>
		<p>Butazolidin [®] Indocin [®] Are anti-inflammatory agents widely prescribed for rheumatism, gout, arthritis</p>	
		<p>Analgesic; antipyretic; anti-inflammatory</p>	

Category	Examples	Comments	Side Effects Interactions
2. Plasma Protein Displacement	a) Acidic drugs like aspirin + phenylbutazone or tolbutamide or chlorpropamide	Aspirin is 70% bound in human plasma and has potential for displacing other drugs	--Gastric bleeding (5 ml/day fecal blood loss reported from ingesting 3 Gms. aspirin/day for 3-6 days) (a) cause of peptic ulcer (b) occasional iron deficiency anemia
	b) Aspirin - Methotrexate	Methotrexate is a folic acid antagonist; it is usually bound to serum proteins	If aspirin displaces other drug, i.e. phenylbutazone, about 2 to 3 times the other drug may be concentrated in unbound form at target site (effectiveness and toxic levels fluctuate) --aspirin + chlorpropamide or tolbutamide might lead to hypoglycemia.
	c) Salicylates - Anticoagulants (coumarin type)	Very serious interaction. If aspirin, etc. must be given, then reduce anti-coagulant dose.	Salicylates can significantly increase concentration of free methotrexate "in vitro"; results in severe bone marrow depression, or death. Displacement of coumarin type anticoagulant by salicylates can increase tissue levels of anticoagulant and cause hemorrhaging and death.

Category	Examples	Comments	Side Effects Interactions
3. Interference with Urinary Excretion	<ul style="list-style-type: none"> a) Aspirin - Probenecid b) Aspirin - Sulfinpyrazone 	<p>Note that drug excretion via urinary route is highly dependent on pH of urine. (Basic drugs are excreted more slowly at a high pH.)</p>	<ul style="list-style-type: none"> --Given alone, either drug reduces serum urate levels; --Given together, uricosuric activity is inhibited; sometimes, urate retention results.
4. Electrolyte Imbalance	<ul style="list-style-type: none"> Aspirin - glucoronide conjugated Corticosteroids R_x Aspirin - other salicylates 	<p>Sodium retention can result in expansion of intracellular fluid (edema) - Digitalized patients, patients on low salt - low sodium diets, must use only with medical supervision.</p>	<p>Aspirin reduces renal excretion of the R_x drug. It possibly competes for metabolic enzymes.</p>
5. Interference with tests	<ul style="list-style-type: none"> a) Thyroid function b) Protein-Bound Iodine c) Protein-Bound Thyroxin d) Salicylate - Phenistix ^(R) 	<p>Salicylates retard release rate of thyroidal iodine into circulation. They may also interfere with action of the pituitary output and action of thyrotrophic hormone (TSH).</p>	<ul style="list-style-type: none"> a) No effect. b) PBI in hyper- and eu-thyroid conditions is reduced.

diagnosis of phenylketonuria

Category	Examples	Comments	Side Effects Interactions
6. Enzymatic Interference	a) Aspirin - Chlorpromazine		a) The 2 drugs compete for metabolic enzymes.
	b) Aspirin - Phenobarbital		b) Pb increases rate of metabolism of salicylates since Pb induces or increases amount of metabolic enzymes.
	c) Aspirin - Corticosteroids		c) Blood salicylate levels may increase to cause severe salicylate intoxication.
7. Interference in Absorption	Salicylic acid - iron	Aspirin was once thought to be a cause of iron deficiency.	Chelates (forms a complex "in vitro"; but, "in vivo" this does not happen - the gastric juice seems to have a stronger affinity for iron than for salicylates.
	Salicylates - anion exchange resins		May be useful in salicylate poisons.

* Adapted from McDougal, Mickey R., J.A.Ph.A., NS10, No. 2, February, 1970 (83-85)

APPENDIX 18

HANDOUT: SOME POSSIBLE INTERACTIONS OF PRESCRIPTION
DRUGS WITH OVER-THE-COUNTER DRUGS AND FOOD

SOME POSSIBLE INTERACTIONS OF PRESCRIPTION DRUGS

WITH OVER-THE-COUNTER DRUGS AND FOOD

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<u>R_x Drug</u>	<u>May Interact With Non-R_x Drug; Food</u>
Antianginal agents (Nitroglycerin)	alcohol
Antibacterial, antifungal agents Furazolidone Griseofulvin Sulfonamides Tetracyclines	alcohol phenobarbital (Tedral [®]) ammonium chloride, aspirin, other salicylates, methenamine colloidal antacids milk, dairy products Ca, Al, Mg antacids
Anticoagulants coumarin type, etc.	alcohol antihistamines aspirin, other salicylates mineral oil phenobarbital (e.g. Tedral [®]) leafy green vegetables
Anticonvulsants (Dilantin [®])	phenobarbital
Antidepressants	adsorptive agents (attapulgate, kaolin, bentonite, charcoal, colloidal antacids)
Antidiabetic agents	alcohol aspirin, other salicylates
Antihistamines	alcohol sympathomimetic amines (in cold caps, etc.) sedatives (bromides, others)
Antihypertensive agents	alcohol antihistamines sympathomimetic amines foods containing pressor amines (beer, chocolate, etc.) licorice
Bronchodilators	antihistamines sympathomimetic amines
Cardiac glycosides	absorbable antacids drugs containing large amounts of calcium milk, dairy products licorice

<u>R_x Drug</u>	May Interact With	<u>Non-R_x Drug; Food</u>	271
Monoamine oxidase inhibitors (antidepressants, pargyline)		adsorptive agents (e.g. attapulgitite bentonite, charcoal, colloidal antacids, kaolin) alcohol antihistamines sympathomimetic amines food containing pressor amines (see antihypertensive agents)	
Oxytocics		sympathomimetic amines	
Phenothiazine derivative (antihistamines, antiemetics, tranquilizers)		adsorptive agents (e.g. attapulgitite bentonite, charcoal, colloidal antacids, kaolin) alcohol antihistamines sedatives (e.g. bromides, scopolamine and scopolamine aminoxide preparations)	
Sedatives, hypnotics and tranquilizers		alcohol antihistamines bromides phenobarbital scopolamine and scopolamine aminoxide preparations	
Sympathomimetic amines		antihistamines	
Thyroid		iodides, iodine-containing drugs used orally (e.g. iodochlor- hydroxyquin) soy bean preparations vegetables of Brassica sp (Brussels sprouts, cabbage, cauliflower, kale, turnips)	
Uricosuric agents		aspirin and other salicylates	
Vitamins, fat-soluble (A,D,E,K)		mineral oil (chronic usage)	

Source: J.A.Ph.A., NS8, No. 2, February, 1968, page 68

APPENDIX 19

HANDOUT: INTERACTION OF SOME DRUGS WITH FOODS

<u>Drugs</u>	<u>Foods</u>
Antibacterial Agents - Tetracyclines	milk, dairy products
Anticoagulants	leafy green vegetables
Antihypertensives	foods containing pressor amines (like aged cheeses, broad beans, pickled herring, chocolate, chicken liver, licorice)
Cardiac Glycosides	milk, dairy products, licorice
Diuretics, oral	licorice
Monoamine Oxidase Inhibitors (anti-depressants, pargyline)	foods containing pressor amines
Thyroid	soybean preparations, brussels sprouts, cabbage, cauliflower, Kale, turnips

* Lamy, Peter P. and David A. Blake, J.A.Ph.A., NS10, No. 2,
February, 1970, page 73.

APPENDIX 20

HANDOUT: SOME POSSIBLE HARMFUL EFFECTS OF DRUGS
WITH DRUGS; DRUGS WITH FOODS

SOME POSSIBLE HARMFUL EFFECTS OF
DRUGS WITH DRUGS
DRUGS WITH FOODS

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1. Nitroglycerin (used to treat "angina"; prescribed by physician) Avoid drinking alcohol; may cause severe drop in blood pressure to the point of causing collapse of heart and blood vessels.
2. Dilantin (used to treat epilepsy; es an "anticonvulsant" ... stops "epileptic fits") Be sure your doctor knows what sedatives you are taking when you are also taking Dilantin or similar drugs. Be very careful; use only what doctor or pharmacist recommends.
3. Oral "diabetes tablets" Do not drink any alcohol, even if it is in a cough preparation! These tablets can increase the action of alcohol on the body; can cause very serious illness; can make the tablet relatively ineffective and make the diabetic condition worse. Avoid using the aspirin type pain reliever.
4. Certain antidepressant agents (Parnate, Marplan, Niamid, Nardil) Do not drink alcohol (beer, wine, whiskey, etc); can cause death! Do not eat cheese, chocolates, broad beans, chicken livers, pickled herring) These agents can cause any number of serious side effects...sometimes, they even cause death! Patient is prone to severe headaches, fast increases in the blood pressure, violent reactions. With certain of these drugs, aspirin should not be taken, especially in large doses. Before eating or drinking any of these foods, see your doctor, even if you are no longer on the prescription, because the effects of these drugs last a long time after one has stopped taking the drug.
5. Anticoagulants (drugs used to keep blood from clotting; examples include Coumarin, Dicoumarol, Panwarfin, Coumadin, etc.) Do not take aspirin; may cause severe internal bleeding. Avoid large helpings of green leafy vegetables...too much vitamin K...can cause bleeding internally. Stay away from cleaning fluids that contain carbon tetrachloride... do not inhale the fumes. Watch that alcohol...can result in the need to change dose of drug. Best not to take phenobarbital (sedative, sleeping tablets)...it affects the amount of anticoagulant in the blood stream.
6. Certain antibacterial agents (Tetracyclines, some sulfonamides (sulfa drugs) some drugs used to treat fungus diseases) Avoid milk and acid neutralizers (Maalox, Amphogel, Gelusil) when taking tetracyclines (an antibiotic)... reduces the

Continued page 2

effectiveness of the drug). Avoid preparations like Tedral which contain phenobarbital when taking internal antifungal drugs...affects amount of drug in blood stream.

7. Agents used to treat high blood pressure Avoid drinking beer and other alcoholic beverages. Licorice has been known to cause increase in blood pressure if eaten in large amounts or if drunk (as in certain cough preparations) to excess while taking medication for high blood pressure. Watch those foods mentioned under #4. Be very careful; should not take antihistamines.
8. Antihistamines Watch that alcohol again! Be careful when using other sleeping tablets or liquids.
9. Sedatives and tranquilizers Do not take these together. Avoid alcohol. Over-the-counter sleeping tablets and bromides can cause severe depression-->sleep-->coma. Antihistamines increase the effects of these drugs.
10. Thyroid preparations Avoid drugs which contain iodine (in some cough syrups, for example) Soy bean preparations, brussels sprouts, turnips, kale, cabbage, cauliflower should not be eaten.
11. Digitalis (and like preparations) Milk, certain antacid preparations (Cramalin, Malgogel, Phosphaljel) should be avoided, or at least not used excessively. Licorice should be avoided. Soda Mints, "foaming" headache remedies, other substances which contain sodium (salt) should be avoided.
12. Vitamins A, D, E, K Do not use mineral oil with these vitamins.

In general, I recommend that you select a pharmacist who keeps some type of family medication record for each family that he serves. He can record all drugs...prescription and over-the-counter on this card. He will ask you to tell him what illnesses you have or have had. He can keep a record of your contacts with the doctor and of your "minor" illnesses. Above all whenever you find it necessary to see more than one doctor, or to change doctors, be sure that you tell the doctor what drugs you have been taking, or give him your former doctor's name so that he can get this information.

APPENDIX 21

HANDOUT: DIARRHEA AND REMEDIES

DIARRHEA AND REMEDIES

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Frequent passage of loose stools (diarrhea) can be the result of poor eating habits, over-drinking, food poisoning, or it can be a symptom of more serious diseases of the lungs, kidneys, heart or liver.

Sudden diarrhea can be caused by:

1. too much fat in the diet
2. overindulgence in alcohol
3. unripe fruits and poisonous mushrooms
4. food poisoning
5. intestinal infections, such as virus infections, bacterial or amebic infections.
6. reactions to common childhood diseases

Continuous, chronic (occurring over a long period of time) diarrhea can be a symptom of:

1. diabetes
2. insufficient vitamins
3. emotional disorders
4. cancer
5. other serious diseases

Unless properly treated, diarrhea can be fatal.

When treating yourself for this condition, if the preparation that you are taking fails to work within 48 hours, see your doctor at once.

Always see your doctor if there is a high fever accompanying the diarrhea.

Examples of remedies useful in treatment of diarrhea:

1. Those which contain Adsorbents (kaolin, charcoal, etc.)
Donnagel: Kaopectate, Paocin, Parepectolin
Take as directed on label.
2. Those which contain Paregoric (exempt narcotic) and other ingredients
Diabismul, Pabizol, Parepectolin
3. Others
Diamagma
Quintess
Lactinex

APPENDIX 22

HANDOUT: SUGAR-FREE DRUG PREPARATIONS

SUGAR-FREE DRUG PREPARATIONS
Selected List by Use

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ANALGESICS

Tylenol Drops	(McNeil)
Temptra Drops	(Mead)

ANTACIDS

Aludrox Suspension	(Wyeth)
Aludrox SA Suspension	(Wyeth)
Amphojel Suspension	(Wyeth)
AMT Suspension	(Wyeth)
Gelusil Suspension	(Warner-Chilcott)
Kolantyl Suspension	(Merrell)
Maalox Suspension	(Upjohn)
Oxaine Suspension	(Wyeth)
Pepto Bismol	(Norwich)
Phosphogel	(Wyeth)
Titralac Suspension	(Riker)
Trisogel Suspension	(Lilly)

LAXATIVES

Colace
Emulserol
Emulserol with Cascara
Peri-Colace
Petrogalar

DIGESTANTS

Beta-Methiscol	(U.S. Vitamin Company)
Gastron with B ₁₂	(Winthrop)
Takadiastase	(Parke-Davis)

NUTRIENTS

Cerefort	(White)
Lipomul Oral	(Upjohn)
Supplifort Elixir	(White)

ANTIDIARRHEALS

Kalpec	(Wyeth)
Kaomagma	(Wyeth)
Kaomycin	(Upjohn)
Kaopectate	(Upjohn)
Parepectolin	(Roerer)
Quintess	(Lilly)

COUGH LIQUIDS

Cerose	(Ives)
Nethacol	(Merrell)
Pruni-codeine	(Lilly)
Terpine Hydrate & Codeine	(Parke Davis)

VITAMINS

Aquasol A	(U.S. Vitamin Company)
Aquasperse	(White)
*Drisdol	(Winthrop)
Engrain Drops	(Squibb)
Jeculin	(Upjohn)
Multi-Vi	(White)
Pluravite	(Winthrop)
Rubraton	(Squibb)
Super D Cod Liver Oil	(Upjohn)
Super D Cod Liver Oil Drops	(Upjohn)
Vifort	(Endo)
Visyneral	(U.S. Vitamin Company)

SUGAR SUBSTITUTES

Diacryst	(Fougera)
Sucaryl	(Abbott)

* Biocrest (Nutrition Control)

APPENDIX 23

"CASE STUDY #1"

CASE STUDY #1

Mrs. Amy Jones, a divorcee, age 33, mother of four children and the sole support of her family, is under medical treatment for peptic ulcer. She takes Maalox Tablets, 2 \bar{q} 2 h, and observes a careful diet. She often has headaches which she labels as tension headaches. For these, she takes 2 five-grain aspirin tablets every 4 hours at her own discretion. She gains relief from the headache but experiences stomach pains and an "upset stomach" as a result.

Problem: Can you explain why Mrs. Jones experiences such side effects?

Can you offer alternative suggestions for Mrs. Jones' self-medicating routine?

APPENDIX 24

"CASE STUDY #2"

CASE STUDY #2

Mrs. Polasky is a very jovial and congenial person. She is diabetic, ambulatory, and resides with her daughter and son-in-law. For nearly four weeks she has taken two 0.1 mg. tablets of chlorpropamide (Diabinese[®]) daily. She joins her family for before dinner drinks nearly every evening. Following dinner, Mrs. Polasky sometimes consumes two brandy manhattans with her family.

On two occasions, Mrs. Polasky complained of nausea, regurgitation, acute flushing, severe headaches, and she nearly passed out on both occasions.

Problem: To what can you attribute Mrs. Polasky's adverse reactions?

What advice, if any, would you offer Mrs. Polasky and her family?

APPENDIX 25

"CASE STUDY #3"

CASE STUDY #3

Mr. Peter O'Hara, age 65, is being treated for severe cardiovascular disease. He likes to drink alcoholic beverages and believes that Anacin[®] will relieve his hangovers. He is taking daily doses of a coumarin type drug. He eats poorly. After following this routine (medication-alcohol-Anacin[®]) three times weekly for two weeks, he is taken to the hospital with internal bleeding.

- 1) Why?
- 2) What should he have done?
- 3) What advice would you give him while attending him at home?

APPENDIX 26

"CASE STUDY #4"

CASE STUDY #4

One year ago, James DeRubin, age 25, developed an "allergy" which he alternately diagnosed as asthma, sinus trouble or hay fever, depending on the season. He tries every "new" drug product that comes on the market. He is now asking your advice--he wants relief of his allergy and something for his frequent headaches.

Advise.

APPENDIX 27

ANALYZE THE COMMERCIAL

A N A L Y S I S

Analyze the commercial--

1. "Take a Bayer break."
2. ". . . Give your cold to Contac."
3. "Take _____, the laxative that most doctors recommend."
4. "Take _____ and sleep, sleep, sleep."
5. "You need Nyquil [®]."