

PERFORMANCE EVALUATION OF A PROGRAM
IN PHARMACY CONTINUING EDUCATION

by

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M.Sc., Dalhousie University, 1973

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF EDUCATION

in

THE FACULTY OF GRADUATE STUDIES
(Dept. of Adult Education)

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

July 1977



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ABSTRACT

The focus of this investigation was on the evaluation of a pharmacy continuing education program and the development and assessment of written simulations as an evaluative tool.

A program designed as a regular course offering by the Faculty and Division of Continuing Education in the Health Sciences to improve the primary care consulting skills of pharmacists, was evaluated in terms of improvement in the participant's real-life performance, gain in factual knowledge and subjective reaction to the educational activity.

In order to measure the quality of primary care consultation, four "in-store-assessment" problems were developed which, in the opinion of a panel of pharmacy practitioners, occur daily in community pharmacy practice. These problems involved a consumer requesting assistance for either a "cold" or a "pain" complaint. Each request was accompanied by a list of possible pharmacist responses which the panel members rated as desirable or undesirable behaviours. Four subsets of these behaviours: "data gathering", "inappropriate recommendations", "appropriate recommendations" and "drug-use-counselling" were selected as performance criteria for each problem.

The effect of the educational activity on the primary care consulting behaviour of program participants (N=34) at their regular place of practice, was examined by the unobtrusive administration of the problems. Assessments were conducted both before and after the program. A "non-equivalent" control group (N=39) was assessed during the same time periods. The problems were presented in a standardized manner by specially trained observers who recorded the pharmacists' behaviours on

prepared performance checklists. Performance scores on each of the behavioural subsets and a total score were calculated to represent the quality of advice given by the pharmacists. The impact of the program on pharmaceutical services was determined by calculating gain scores. There was a significant improvement in the overall performance score for the pharmacists who attended the educational program. There were significant gains in the performance of course participants for "data gathering" and "appropriate recommendations" behaviours. There were no significant changes, in any of the performance areas, for the "non-equivalent" control group.

Tests for factual knowledge were developed for the content areas of "cold" and "pain". These were administered to the course participants before and after instruction on these topics. There were significant gains in the recall of the information by the pharmacists. There were no significant relationships between an individual's score on these tests and performance scores on the requests for primary care.

A magnitude estimation scaling technique was used by the participants to evaluate the program on several dimensions. In their opinion this program was superior in all aspects to the average continuing education course attended in the past.

Four written simulations were developed with the aid of the panel of pharmacy practitioners. Each was constructed with respect to a specific request for primary care assistance. The content of the simulations approximated the content of the four problems used to assess the pharmacists' behaviours at their place of employment. The

pharmacists enrolled in the program completed the simulations before and after instruction on "cold" and "pain". The performance scores on the four simulations were compared with the performance scores on the corresponding problems used during the "in-store-assessment". All four simulations had a positive correlation with the pharmacist's real-life performance. Two of the simulations had significant correlation coefficients. Selected common behaviours were compared between the written simulations and the "in-store-assessment" problems. A consistency score was calculated representing the agreement among performance on the items. For the pre-and post-measurements the respective mean consistency scores were 66.54 and 65.71 percent.

There were no significant relationships between scores on the tests of factual knowledge and performance scores on the written simulations.

The results suggest that this continuing education program was a success. There were improvements in real-life performance, significant gains in factual knowledge and feelings of satisfaction with the program on the part of the program participants. As well, the findings in this study indicated that written simulations hold promise as an objective evaluation tool for continuing pharmacy education and were capable of predicting real-life behaviour.

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ACKNOWLEDGEMENTS

The author would like to express deepest thanks to the members of his dissertation committee: Dr. Coolie Verner, Dr. John Collins, Dr. Raymond Jang, Dr. Gordon Page and Dr. Bernard Riedel for their continuous guidance and assistance.

The assistance of Dr. Roger Boshier for his contribution to the initial development of the research project is acknowledged. In addition, I am grateful to Dr. Dale Rusnell and Mr. Nicholas Rubidge for their assistance with some of the computer programming and for the guidance of Mr. Adrian Blunt in the preparation of the magnitude estimation evaluation form.

The author would like to express sincere thanks to the panelists who assisted in the development of the written simulations and the in-store-assessment problems: Dr. Dennis Andrews, Ms. Loree Eldridge, Mr. Peter Hutt, Mr. Ronald Ingraham, Mr. Munroe MacKenzie, Mr. Nicholas Otten, Ms. Karen Pylatuk, Mr. Ian Sands, Ms. Sharon Tudor and Ms. Louanne Twaites.

The assistance of Mr. Alexander McGechaen, Dr. Raymond Jang, Ms. Jennifer Boshier, Ms. Louanne Twaites and Ms. Helen Fielding in the preparation of the four videotapes is gratefully acknowledged.

Deepest thanks to Ms. Joan Britt, Ms. Ruth Burstahler, Ms. Ann Scott, Mr. Wayne Soucy, Dr. Mitchell Samek, Ms. Gail Riddell, Ms. Karen Unrah and Ms. Anna Welbourne for assisting with the collection of the in-store-assessment data.

The financial support for this study was provided by the Mr. and Mrs. P. A. Woodward Foundation. In addition, the author would like to thank the W. K. Kellogg Foundation for its financial support and its University of British Columbia project officer, Mr. Robert Gobert, for his assistance during this research study and the author's graduate program.

The support of the College of Pharmacists of British Columbia is gratefully acknowledged.

The assistance of Ms. Margaret McLeod, Ms. Dolores Vader in typing the drafts and Ms. Juliet Hearty for typing the final manuscript is particularly appreciated.

Deepest thanks to my wife, Helen, for her constant support, encouragement and assistance with this project.

CHAPTER ONE

PURPOSE OF THE STUDY

Introduction

As all things change with time, so too does the profession of pharmacy. At one time the apothecary was seen as the mixer of secret formulae containing exotic ingredients. Later in history, the emphasis was on the pharmacist's skill in manufacturing pills, tablets, syrups and tinctures. In more recent times, the pharmacist's role changed to being principally a dispenser of medications, with a strong emphasis on drug-use-control. Today, as never before, the pharmacist is regarded as an important source of information on prescription and non-prescription drugs. It is suggested that the charge of the modern day pharmacist is to be a consultant to other members of the "health team" and to the general public on the use of drugs. There is increasing evidence that the community pharmacist is being asked to perform more frequently as a primary care consultant. In this role, the pharmacist is the first to be approached about health problems.

Studies have found however, that many community pharmacists are not adequately performing their role of advisor to the consumer on the use of non-prescription drugs (1,2,5). These reports also suggest that this performance deficit is due, in part, to a lack of knowledge. There appears, therefore, to be a need for improving the pharmacist's ability to act as an advisor to the patient. Once a bona fide need has been identified, the traditional method of closing

the gap between performance and desired performance is to design an educational program.

Inherent in every educational program is the responsibility to evaluate its outcomes. The available means for evaluation can be placed on a continuum, ranging from the subjective measures at one end to the objective measure at the opposite end. The subjective evaluation instruments are usually easier to design and administer but the data they yield are of questionable value. The objective evaluation instruments require considerably more time, money and energy to design and validate, but their results are superior in documenting learning. The evaluation procedure at the extreme end of the objective pole, unobtrusive observation of real-life performance, is at present the only reliable indication of how much learning has been transferred into action in the real world.

Traditionally, continuing education in pharmacy has been evaluated with subjective measures. Usually these take the form of the "happiness index". About the only form of objective evaluation that has been occurring consistently is the use of pre- and post-tests for factual knowledge recall. This appears to be the limit of objective evaluation for program effectiveness. For a number of reasons, the most important forms of evaluation, involving the more direct measures of behaviour change and determining the impact of individual programs on the quality of pharmaceutical services, have been virtually ignored. To date there has been only one reported study which looked at real-life, on-the-job performance of pharmacists after participation in a

continuing education program (4).

Realizing that unobtrusive, on-the-job evaluation is expensive to design and operate and difficult to arrange, many of the other health professions are examining other objective evaluation instruments which purport to approximate real-life behaviour. One such technique, which is receiving considerable attention as an evaluation tool, is written simulation. This technique calls for an individual to apply knowledge gained in an educational program in the solution of a simulated problem.

Written simulations have not been used in pharmacy to this point. However, their application to assess the performance of a pharmacist advising a consumer on the use of non-prescription medications in response to a primary care request appears appropriate. The obvious question is, "Do written simulation scores predict real-life performances?"

Studies have compared an individual's performance on a written simulation to his or her assessment of a known simulated patient. However, there has been only one study comparing performance on a written simulation to performance in an actual practice situation where the subject was unaware that he or she was being assessed (3).

Purposes

There are three general purposes for this study. The first is to develop a method to objectively evaluate a continuing education program in terms of its impact on the pharmacy services subsequently provided by the course participants.

To achieve this purpose, the following three objectives were set:

1. To develop four realistic primary care requests, in the area of non-prescription medications, to be used as in-store-assessment problems (ISAPs).
2. To devise and validate a comprehensive list of observable pharmacist behaviours, in response to the requests, which will enable an evaluation of pharmacists' primary care consulting skills.
3. To assess the improvement in the quality of primary care consulting by those pharmacists who participated in the continuing education program.

The second purpose is to develop methodology to evaluate and subsequently to evaluate the continuing education program in terms of more traditional evaluation data and to investigate relationships between these data and the course's impact on the pharmacy services provided by course participants.

To achieve this purpose, three additional objectives were set:

4. To measure the gain in factual knowledge as a result of participation in the program.
5. To determine the relationships between scores on a factual knowledge test and real-life performance.
6. To obtain the participant's subjective evaluation of the program.

The third purpose is to study the validity of written simulations as a technique for evaluating the effectiveness of continuing pharmacy education programs.

To achieve this purpose, two objectives were set:

7. To develop and validate four written simulations which were suitable for evaluating a pharmacist's performance in the area of primary care consulting.
8. To assess the predictive powers of the written simulations by comparing the pharmacist's real-life performance with that of his performance on the simulations.

Importance of the Study

Pharmacists are increasingly being asked to serve as an information source to the consumer on the use of non-prescription drugs. Studies indicate, however, that the level of performance in this area is less than desirable. Continuing education programs have been suggested as one means of improving the performance in this important area of pharmaceutical services.

Traditionally, such continuing education programs in pharmacy would be evaluated by measuring gains in factual knowledge and/or the satisfaction of the course participants. Rarely has a pharmacy program been evaluated in terms of the behavioural changes of participants. Moreover, little research has been conducted on adapting or developing new evaluation techniques.

This study of a continuing education course is significant because it is one of the first evaluations in the health sciences to unobtrusively evaluate change in the actual practice performance of the participants. It is also the first time that written simulations have been developed for pharmacy practice. It is one of only a few studies which attempts to assess the predictive validity of written simulations by comparing an individual's performance on a written simulation to his or her real-life performance.

Overview of this Report

The remaining chapters of this document examine the relevant literature; discuss the development of the instruments used in this investigation, and present results documenting their reliability and

validity; describe the experimental design employed for evaluating the educational program and assessing the predictive validity of the written simulations; present and discuss the results of the evaluation of the program and the assessment of predictive powers of the simulations. The final chapter summarizes the study and its conclusions.

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Chapter One

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CHAPTER TWO

LITERATURE REVIEW

This chapter will present a review of the literature pertaining to the pharmacist as a primary care consultant, continuing pharmacy education, evaluation and simulations, as these topics relate to this study.

The Pharmacist as a Primary Care Consultant

Community pharmacists are being asked to assume a role as a primary care consultant (10,11,18,28). There are a number of factors which have lead to this recent challenge. An information source is needed between the consumer and the drug product - particularly in relation to the use of non-prescription medications. It is generally reported that adverse reactions to drugs (both prescription and non-prescription) account for three to five percent of the hospital admissions in the United States (18). In the United Kingdom it has been estimated that less than one-third of all symptoms of ill health are referred to a physician (72). Because self-medication is a part of current behaviour, non-prescription drug products account for one-third of the total expenditures on medicaments and are used twice as frequently as prescription drugs (72). In countries offering state paid medical benefits, physicians are often requested to treat conditions which are of short duration and self-limiting in nature (72). What is needed in many such cases is a non-prescription medication which will give symptomatic relief. The pharmacist should be able to

provide the necessary advice in the selection of such products.

The profession of pharmacy is advocating that its members accept responsibility for advising the consumer on the use of non-prescription medications (17,22,33,61). In the United States, The American Pharmaceutical Association has been conducting national campaigns of public education emphasizing the pharmacist as a source of information on non-prescription drugs. The theme of the 1975 campaign was "Over the Counter Intelligence" (59). The Association's theme for 1976 was expanded to include all medicinals and used the slogan "Be Wise With Medicines, Ask Your Pharmacist How" (11).

Although advising the consumer on the use of non-prescription medication is not a new role, recognition as a consultant on primary care problems is recent. This does not suggest that the advice of a pharmacist take the place of the treatment by a physician but there are some minor problems that can be dealt with efficiently and effectively by a pharmacist. However, it is crucial that the pharmacist have the ability to differentiate between those problems requiring physician attention and those self-limiting problems in which a non-prescription product to relieve the symptoms may be warranted. The role of the pharmacist as a primary care consultant is "part of the total health care system" (72, p.173, see also Bass (10), Lister (47)).

Studies conducted to evaluate the quality of advice given by pharmacists in response to primary care requests indicate a low level of performance (40,42,73). In a surprising number of cases, products

were recommended without the pharmacist asking any questions and this often resulted in the consumer purchasing a product which could have potentially harmful effects. Investigators were shocked at the casual manner in which requests were treated and questioned whether some recommendations were not solely profit motivated.

In a survey in the United Kingdom, 183 pharmacists were asked to give advice on a series of mild symptoms of short duration, including headache, sore throat, constipation and indigestion. The investigators had some 70 different products recommended for the four complaints. An advisory panel felt that most were reasonable but did comment that, in their opinion, about one in ten recommendations were ineffective. The responses of the pharmacists to the request ranged from no questions to many questions and from "here take this" to "see a physician" (29,74).

It has been suggested that pharmacy is a marginal profession with professional and business goals often in conflict (36,50). If pharmacists could be categorized as business oriented and professionally oriented, then perhaps there would be an explanation for the poor performance of some pharmacists as advisors to patients. However, studies were unable to substantiate this hypothesis (45,46).

There has been little research determining the extent to which pharmacists act as primary care consultants. One study in London, Ontario asked five pharmacies to keep a record of primary care requests over a two day period (10). It was found that three of the pharmacies provided 20 or more primary care services per day. Sixty percent of the requests could be classified upper-respiratory tract problems,

stomach and bowel problems, pain and vitamin enquiries. In response to the request the pharmacists could (a) recommend a non-prescription product, (b) refer the individual to a physician, or (c) give other advice, reassurance, or information which did not involve recommending a non-prescription product. The advice given by pharmacists surveyed was as follows: 80 percent recommended a product, 12 percent suggested seeing a physician, and 8 percent gave other advice.

When the pharmacist responds to a primary care request the following approach has been suggested: take a brief history, make an initial assessment and suggest a course of action (10). There is a role for the pharmacist in handling common complaints such as stomach and bowel problems, pain and upper-respiratory tract problems but there are doubts that the pharmacist is trained sufficiently to perform this function. Pharmacy faculties have started just recently to include courses on applied therapeutics and non-prescription medications in their programs. There are, therefore, implications for continuing education.

Continuing Pharmacy Education

Like all other professions, Pharmacy is experiencing a knowledge explosion and increased demands on its members. The pharmacist is being asked to provide better services and to assume new roles. There is an awareness on the part of the members of the pharmacy profession that continued learning is a necessity. In one bibliography on continuing education for the years 1960-1975 there

were 82 citations expounding the need for continuing education (26).

The profession has responded. There are numerous continuing education programs yearly in every jurisdiction in North America. These are offered by faculties of pharmacy, either alone, or in conjunction with some professional body.

Mandatory Continuing Education

The predominant theme of continuing pharmacy education of the late 60's and early 70's was whether or not it should be mandatory in order to retain licensure status. Ten states (3) in the United States legislated mandatory continuing education during this time with little regard for the standards of programs being offered, the legal implications of making it mandatory, the ability to supply programs in the mandatory states and the administrative headaches that it would create.

During 1972-1974 the literature reflects some soul searching on the part of pharmacy educators concerning the appropriateness of mandatory continuing education. They felt that if the goal is to assure the continued competency of the members of the profession then perhaps mandatory participation in education is not the best means to that end. The professional bodies, as well as the educators, raised questions and this had a divisive effect. This is demonstrated in the following observation:

[there appears] to be a split developing in the profession of pharmacy. NABP has no intention of backing down from its insistence that continuing education for pharmacy be mandatory, and that there be no "moratorium" on the enactment of state laws requiring evidence of continuing educa-

tion as a condition of relicensure.

A moratorium has been called for by the APhA and AACP, which claim there is as yet no evidence that mandatory, rather than voluntary continuing education is needed to assure the continuing professional competence of pharmacists (4, p.26).

In 1973, a task force was formed by the APhA and AACP to investigate and report on continuing competence. The preliminary report of the committee was delivered in 1974 and the final report in 1975 (1,2). The following is an important excerpt from the report which was careful not to endorse mandatory continuing education.

Each individual practitioner could be obliged to comply with standards of competence, developed nationally by the profession, and accepted, supported and enforced by each state through requirements for relicensure (2, p. 433).

The task force further proposed

...the creation of a Pharmacy Practice Standards Commission whose primary responsibility would be to identify and recommend national standards of competence that individual pharmacists would be required to meet. This commission should also devise and identify the means by which continuing competence in pharmacy may be determined (2, p.435).

In the report, there is the underlying belief that, until such time as the standards of competency are set, and the means to assess each pharmacist are devised, participation in continuing education should be encouraged rather than required.

In Canada, the approach to mandatory continuing education has followed that of the United States. Some provinces, Alberta and Saskatchewan, have legislated mandatory participation in continuing education. Some provinces, Quebec and Ontario, provide continuing education materials which go to every pharmacist in the province, but

do not require proof of completion. In British Columbia, the professional association is currently trying to identify the competencies a pharmacist should possess, in order to assist in determining continuing education needs.

Clearly, legislating mandatory continuing education is placing "the cart before the horse". There are some fundamental questions about the effect of continuing education programs on the quality of pharmaceutical services which should first be answered. What is needed are concentrated research efforts to develop better evaluative instruments and apply them in assessing program impact.

Research

In a review of the literature for the period 1960-1970 Nakamoto and Verner made the following comments:

. . . The University schools of Pharmacy have done virtually no research to provide a basis for programs and such that has been done suggests that continuing education has made but a minimal impact upon the practice of pharmacy because the knowledge essential to functional program planning has not been acquired through research. As the role of the pharmacist changes, so must the form, content and duration of education in pharmacy. In the literature reviewed there was no evidence to indicate an awareness of this in the schools.

Of the several health professions, pharmacy is the most backward with respect to continuing education. The profession must be aroused to the need for it to ensure the survival of pharmacy as a profession (56, p.p. 33-34).

In their review of the literature for that ten year period, Nakamoto and Verner claimed to have found "only 33 references related to continuing education of which only seven were of a research nature" (56, p. 7).

The vast majority of research in continuing pharmacy education has been of the descriptive, exhortative variety. The predominant method of investigation has been the survey. There has been very little experimental research in which variables are manipulated or hypotheses are tested (56). For example, the research which is available describes the reasons for participating (or reasons for not participating), the content and the difference processes used by the instructors and program planners.

Participation in Continuing Pharmacy Education

A 1963 survey conducted in Mississippi, in which 900 questionnaires were mailed out and from which there were 111 usable returns, indicated that 103 pharmacists expressed an interest or desire to participate (35). Of these 103 pharmacists only 13.6 percent had actually participated in previous programs.

In a similar survey conducted with a random sample of 300 Indiana pharmacists, it was found that the continuing education programs were reaching only a small proportion of the state's pharmacists (62). As well, it appeared in this study that the same pharmacists were being reached over and over again.

Jobe (41) conducted a survey of all the colleges of pharmacy holding membership in AACP in the United States. A participation index was used to measure the success in promoting the programs. The participation index was simply the number of participants divided by the number promoted and expressed as a percentage. The findings indicated that when programs were sponsored jointly by the college of

pharmacy and the professional associations, the participation indices increased.

As part of their annual license renewal in 1973, all pharmacists in Wisconsin were required to complete a questionnaire on participation in continuing education for the years 1969-1973. The results of the survey and official registration data for that time period were computer tabulated and subjected to Chi square analysis and reported by Arndt, Demuth and Weinswig (5). It was found that 43.8 percent of 1,208 pharmacists participated in at least one program for the period 1969-1973. The most frequent attendants at the programs were age 30-49, were active members of their professional association, were full-time pharmacists and were more likely to be hospital pharmacists.

Bernardi (13) conducted a survey of Connecticut pharmacists. His sample consisted of 168 pharmacists, 108 chosen at random from a state membership list and 62 known participants in continuing education. These pharmacists were classified as participants or non-participants depending on their enrollment in continuing education programs over the last three year period. He found that eight out of ten pharmacists spent four hours per week reading journals or were engaged in some other form of continuing education. Bernardi indicated that three times as many participants as non-participants were in favour of mandatory continuing education. Another aspect of the study published elsewhere (14), measured pharmacists' attitudes toward the concept of continuing education. He found that those who participated in continuing education

had a more favourable attitude toward continuing education.

Attitude

Rouege, Kirk and Weinswig (63) conducted a study to measure the educational attitude of participants and non-participants. They determined the difference in attitude was related to the degree of participation in adult education activities. A significant difference ($p < .01$) was found between the composite attitude score when comparing participants and non-participants. A significant correlation ($p < .01$) was found between attitude toward continuing education and participation in an organized learning activity.

Kotzan and Jowdry (43) developed a questionnaire to measure the attitudes of 95 Georgia pharmacists on the last evening of a continuing education course. The attitudes measured were: general attitude toward an educational experience, relevancy of program material, ability of program lecturers and the management of the program. The only significant finding was that institutional pharmacists - mostly hospital pharmacists - had a more general negative feeling toward this adult education program. The possible explanation for this finding was that because the hospital pharmacists work in a teaching-learning environment, they have a greater access to journals and texts and also on the average attend more adult education programs than most retail pharmacists, and may, therefore, find the material redundant (see also Carlin, (20)).

Content

In the surveys conducted to determine which topics were most preferred by pharmacists, pharmacology and/or advances in pharmacy

usually head the list (24,35,39,62). Business management courses always appear high on the list (35,62). This is probably due to pharmacy being unique among most health professions in that the (36) predominant branch of pharmacy has both a professional service component as well as a business component. Interprofessional relationships and new legislation are other topics requested (62,75).

Processes of Continuing Pharmacy Education

The concern over sparse attendance was evident early in the history of continuing education programs in pharmacy. Strommen voiced the necessity for promotion, salesmanship and even showmanship to "coerce" pharmacists into attending the programs (66). Along with the cries for increased promotion, came the pleas for new and innovative methods and techniques to deliver the message. Techniques were needed which would enable the pharmacist to study at home or at least not have to drive for two hours in order to attend.

Most of the new ways of delivering the continuing education still used some variation of the lecture as the technique. This may be explained by the lack of familiarity of the instructors and pharmacists with other techniques. Also, pharmacy continuing education programs have been used chiefly to disseminate information. In the 1963 Mississippi survey (35), 64.1 percent of the pharmacists responding preferred this method of presentation.

One of the first attempts to use television was by the Philadelphia College of Pharmacy and Science when they programmed 30 minutes of educational activity on a local commercial station (44). In

Minnesota, closed circuit television was chosen in preference to using the public channels. This attempt to increase participation involved a 60 minute presentation using videotapes and a telephone hookup to answer questions on live camera (38).

Hodapp and Kanun (37) compared student learning using programmed instruction and closed circuit television at the University of Minnesota. They mailed a letter to 2,300 pharmacists asking their co-operation in the study; 958 agreed. From this list a sample was randomly selected to participate in the programmed instruction. A pre-test was then mailed. A follow-up test was administered three months later. The television group completed a pre-test, a post-test and a follow-up test. As well, the post-test was mailed to a group who did not take part in either educational experience. When the results were compared both experimental forms seemed to produce an equal gain in knowledge compared to the control group.

The application of the tele-conference method to continuing pharmacy education has been described by Blockstein and Durant (16). A pre-taped lecture was played over a telephone system and carried to various centres where it was broadcast by a loudspeaker. After the lecture, a panel would discuss, live, the important points and answer questions from the participants along the system.

In pharmacy continuing education the correspondence courses from the St. Louis College of Pharmacy have gained widespread fame. When started in 1964, there were 50 participating pharmacists from the St. Louis area. In 1969 the course had 6,000 students from 14 countries around the world (9). In an evaluation of the program, Barnes (8) re-

ceived an 85 percent return on 500 questionnaires mailed to participants. In a further evaluation (9) the correspondence courses were rated better than other forms of continuing education by 87 percent of those who completed the course and 47 percent of those who did not complete the course.

Audio cassette tapes have become a popular means of delivering continuing education in pharmacy. The University of Wisconsin has perhaps become the most famous institution involved in the preparation of such programs. Most cassette tapes are approximately one hour long, deal with a single concept and are accompanied by an outline of the lecture. The package usually includes a short quiz for a self-test (6, 34).

An evaluation of an audio cassette tape lecture course at the University of Wisconsin was conducted by Blank, Kirk and Weinswig (15). The evaluation included pharmacists from Florida, where continuing education is mandatory, and pharmacists from Michigan, where continuing education is voluntary. The data were based on 69 individuals from Michigan and 67 from Florida. The program consisted of eight tapes, each one hour in length, which were mailed to the pharmacists after a pre-test was administered. Two months later a post-test plus an evaluation form was mailed to the pharmacists in the two states. The investigators found no significant difference between the pharmacists' scores on the post-test or pre-test when comparing the two states. Thus, the pharmacists in both states were at the same level both before and after the course with respect to the program content. There was a significant gain in post-test over pre-test for both groups. Hence, practising in a state where

continuing education is compulsory did not mean, in this instance, that the pharmacists will perform better. Pharmacists with less than ten years' experience and hospital pharmacists scored significantly higher on the pre-test. Pharmacists who had been practising less than ten years scored significantly higher on the post-test. In an evaluation of the program, the least liked aspects were the inability to ask questions and the difficulty in finding a specific spot on the tapes when searching for a particular point. Audiotapes, therefore, appear to be an effective means of delivering continuing education for certain groups of pharmacists (see also DeMuth, Kirk and Weinswig (27)).

Evaluation

Adult Education

Evaluation is an essential part of adult education. Unless an evaluation is conducted in the context of the program objectives, the program is incomplete. Until recently, adult education was thought to be inherently good and, therefore, it was unnecessary to evaluate its effects (19). It has been only in the last quarter century that adult educators have been asking questions about the attainment of their goals. They were no longer prepared to accept Essert's assertion that, "to a major extent adult education stands on its own merits . . . It must add significance to the life of an adult momentarily or permanently or it does not continue." (30, p. 161) The attendance record was no longer the sole means for evaluation. The U.S. Adult Education Association's Committee on Evaluation suggested that evaluation of adult education programs should be grounded in the following conceptual

framework:

The purposes of education are growth and change - change in behaviour of individuals and groups. People behave differently as the result of education.

The primary purpose of evaluation in education is to find out how much growth and change have taken place as the result of educational experiences. One evaluates a total program or major parts of it to find out how much progress has been made towards program objectives (23, p. 7).

Adult educators (19,67) increasingly believe that the underlying assumption about evaluation is that it must measure a change in behaviour. Thiede has stated the following reasons for evaluation: "1.) guiding growth and development; 2.) improving programs; 3.) defending programs; 4.) facilitating and encouraging staff growth and psychological security" (67, p. 192). Numerous authors (19,31,67, 69,70) agree that evaluation starts with some clear cut statements of what it is hoped the program will accomplish. These should be stated in specific terms and articulated in the context of measurable behaviours (70). Next it is necessary to state what is acceptable evidence of the accomplishment of these goals or objectives. Then follows a decision regarding the procedure for collecting the evidence. In the final step, the evidence is collected, summarized and used to make some judgements about the programs in terms of its original objectives.

Verner has stated (69,70) that there is a need to apply the rigorous procedures of social science research to evaluation in adult education. This should be done to develop and test new instruments which would have wide usage in the field. He emphasizes the need for accurate, well-reasoned evaluation tools, for "it is better not to

evaluate at all than to do unwisely or ineptly" (70, p. 95). The need for research in the development of evaluation tools is also expressed by Thiede (67). He believes that self-evaluation tools need development and experimental work to allow later incorporation into adult education in ways that facilitate the learning process.

Frederiksen (31) has discussed seven mechanisms for evaluating the outcomes of instruction. They are: soliciting opinions, administering attitude scales, measuring knowledge, eliciting related behaviour, eliciting "what I would do" behaviour, eliciting life-like behaviour and observing real-life behaviour. Each has advantages and disadvantages as well as appropriate uses.

Soliciting opinions about the educational activity will not give an indication of a behavioural change, unless, of course, one was trying to change opinions.

Attitude scales give very little indication of a change in behaviours. Frederiksen (31) discounts this means of evaluation by suggesting that there is little evidence which shows the scores on attitude scales correlate with actual behaviours.

It is appropriate to measure knowledge when the simple possession of information is the objective of instruction. However, in most cases the objective is the application of that knowledge to a pressing problem. Therefore, it is the behaviour of applying the knowledge which is the true measure of success of education and not the accumulation of information.

In some cases it is difficult to measure accurately a particular

behaviour. In these instances a related behaviour could be measured. "But since the relationship of the related behaviour to the ultimate criterion must be inferred on the basis of a logical relationship, the validity of the criterion can not be taken for granted" (31). Eliciting "what I would do" behaviour may result in a response to please the examiner. It may not be what the learner would do in real life.

Frederiksen sees advantages in eliciting life-like behaviour rather than observing real-life behaviour:

The real-life behaviour is the closest to the ultimate objectives of instruction, but observing behaviour in real-life is rarely a good technique for evaluating because of lack of control of the test situation. The method of eliciting life-like behaviour in situations that simulate real-life is recommended for first consideration as a measurement technique (31, p.345).

Pharmacy Continuing Education

In pharmacy, the following techniques have been used for evaluating programs and instruction. Participation as measured by enrollment figures is a criterion often used (5,13,35,41,60). The "happiness index" or soliciting learners' opinions is probably the most frequently used evaluation technique (8,9). Attitude scales have become popular in recent years (14,43,63). The pre-test/post-test design has often been used to measure knowledge gained (15,37). Most recently, there has been one study which unobtrusively measured the behaviour of a group of pharmacists who completed a programmed instructional package on drugs used in the treatment of urinary infection (71). The investigators observed the pharmacists post-course,

real-life performance and compared it with that of a control group. They found that there was a significant difference in the recall of factual knowledge and in the real-life performance but not in attitude between the two groups.

In the health professions, continuing professional education has been seen as a panacea. It is frequently viewed as the means for maintaining competence. However, Neylan (57), in a review of the literature on maintaining competence, for the years 1970-1973, has suggested that this faith is not supported by research. Long, has said that "an examination of the public health literature reveals little evidence of efforts to measure the actual accomplishments of continuing education courses". According to Long, one of the underlying assumptions regarding continuing education is "new knowledge, new points of view, new orientations acquired in courses will be retained and translated into improved attitudes and behaviours which will, in turn, enrich public health programs".(48, p. 968).

Two studies conducted in medicine (51,76) indicate that continuing education programs had no significant improvement on the delivery of health care in that profession. The other health professions, including pharmacy, have done little to attempt this form of evaluation.

Simulations

An Overview

Like so many other innovations in education, simulation technology was first developed by the military (21,25,32). Gagne (32)

indicated that simulations in the military are of value in training, assessment of proficiency, and development of an operational doctrine. On the issue of proficiency measurement, Gagne felt that "simulators frequently provide the most convenient, realistic and objective method available for the assessment of performance" (32, p. 237).

Business and industry were the next to use simulations for the training and the evaluation of decision making (25). Simulations were later applied to educational processes such as instruction, evaluation, research and educational development (25,68). Assessment and instruction have seen the widest use of simulation technology (54).

McGuire explains simulations in the following manner:

Reduced to its essence, simulation consists merely in placing an individual in some aspect of reality, and designing around that setting a problem which requires the learner's active participation in initiating and carrying through a sequence of inquiries, decisions and actions. The situation must be arranged so that each of the learner's activities triggers appropriate feedback which he can utilize in subsequent decisions about pending actions, decisions which may in turn modify the problem (54, p. 19).

Simulation technology is currently being applied to a number of educational endeavours. Business and industry have developed numerous simulations in the area of management training, business administration and labour relations. A number of these simulations have been reproduced and are available commercially from private training firms. The medical profession has used simulations for instruction in the area of interpersonal skills, diagnostic skills and problem-solving (25,52,53,54,64). As well, the medical profession is examining simulations as a means of evaluating learning, assessing instruction

and measuring competency to practice (52,64).

There are a number of different types of simulations being used. These range from paper and pencil, written simulations to computer aided simulations and live simulations using specially trained patients. Each require the learner or examinee to gather information related to some problem and to take a course of action which results in immediate feedback on the consequences of such action.

McGuire (53,54) discussed the following advantages of simulations: "perceived relevance, predetermination and preselection of task, standardization of the task, improved sampling of performance, improved rating of performance, increased responsibility and realistic feedback in a practical time frame, compression of real time and increased learning."

The major limitations of simulations have been outlined by McGuire (53,54) and Demers (25). They are only an indication of how an individual is capable of behaving. They only approximate reality. They do not exactly duplicate reality. They are, in fact, simpler than reality. "The more complex the task we are trying to teach or evaluate the more nearly the simulation has to resemble reality" (25, p. 47).

The adult education literature contains few references related to the use of simulation technology. Mackenzie commented that this was unfortunate and added that, in his opinion, simulation games "hold forth promise for the enhancement of adult learning" (49, p. 293). Mackenzie felt that simulation games had a number of attributes which

make them useful to adult education. They are based on significant principles of learning. They are motivating. They provide the learner with a chance to actively participate in group situations which encourage interaction of the learners. They provide opportunities for important learning outcomes such as decision-making and problem-solving. Mackenzie summarized his view in the following manner: "simulation games technology will not revolutionize adult education, but this technology can go a long way in improving the quality of adult learning" (49, p. 74).

Although two examples of the use of simulation technology for instruction in adult education are reported by Nicely and Knolle (58) and Barkley and Dickinson (7), it has not as yet been used extensively to evaluate instruction. One profession which has concentrated on the use of simulations to measure instructional outcomes is medicine. A particular type of simulation which has been gaining popularity in continuing medical education is the written simulation or patient management problems (PMP's). One reason for their popularity is that they are relatively inexpensive. They are now being used widely in medicine and experimentally in other health professions such as nursing, dietetics and occupational therapy (65). They have not as yet been used in pharmacy (55).

Written Simulations

Written simulations are reported to be of value in assessing critical thinking and problem solving, however, there have been no studies to test the validity of this assertion. Sedlacek and Nattress

qualify their enthusiasm for written simulations by stating that "the greatest difficulty in attempting to use the results of PMP's in evaluation is that there is no strong evidence of a direct relationship between performance on an exercise and what a physician may do in practice" (64, p. 263). They later add that "ultimately PMP's must be validated against an external criterion of physician performance" (p. 266).

The issue of generalizing results obtained from written simulations to the real world is at present a clouded one. Early studies were somewhat encouraging according to McGuire (53), but later studies are causing investigators to question the generalizability of problem solving skills demonstrated on written simulations.

Reliability and Validity

The reliability and validity of written simulations are difficult to determine because normal psychometric procedures do not always apply (65). The following summary was presented by Shannon.

Reliability:

- (a) internal consistency (compare parts or components): PMP's have interrelated differently weighted parts, hard to find comparable parts
- (b) stability (test-retest): hard to retake a PMP, too much learning takes place, plus the feedback answers are uncovered
- (c) combination of (a) and (b) (alternate form): What is an alternate form of a PMP? (65, p. 71).

Shannon has said that the University of Illinois School of Medicine has stressed generalizability and interrater reliability.

Generalizable to: 1. similar cases
2. a discipline
3. overall clinical competence

Interrater reliability: Do other M.D.'s
Feel the weights are appropriate?
(see Sedlacek and Nattress (65)).

Validity:

- (a) face validity: to date the major source of PMP validity. Experts (clinical faculty) declare this is the process that one goes through in case management: students have said that "these are more like real cases", etc.
- (b) construct validity: do second year students perform better on PMP's than non-medical students and worse than residents?
- (c) concurrent validity: parallel criteria are unreliable or lacking, so little conclusive results to date (65, p. 71).

Predictive Validity

By far one of the most important questions is the predictive validity of written simulations. Does an individual solve a problem in a written simulation format in much the same way as he or she solves that problem in the real world? Since an evaluation in the real world is difficult and often impossible, simulations with significant predictive validity would enable an estimation of an individual's real-life performance. This would be among the strongest evaluation techniques currently available to educators.

It is difficult to ascertain the predictive validity of written simulations. In previous work, the performance on written simulations was compared to other simulated situations such as a simulated patient in a physician's office. In some instances, it was compared to a chart review or a physician's record keeping behaviour. These were not real-life behaviours. More recently physicians'

performance on a written simulation about drug induced agranulocytosis was compared to their real-life practice (60). In both situations, the mortality rate from drug induced agranulocytosis was the same, ten percent. "This result could be interpreted as implying that performance in the simulation test may be predictive of clinical performance, at least when dealing with agranulocytosis" (60, p. 660).

Summary

Some of the literature reviewed for this chapter indicated pharmacists were not performing adequately their role as advisors to the public on the use of non-prescription medications. As well, other authors saw an expanding role for the pharmacist as a primary care consultant. Continuing education, it has been suggested, will assist pharmacists to improve performance in such areas and to cope with change. Furthermore, there was evidence in the articles reviewed that more jurisdictions¹ are requiring mandatory participation in continuing pharmacy education activities. Although, there has been a change in both the quantity and quality of the research activities since the report of Nakomoto and Verner (56), much remains to be done to determine the effectiveness of continuing education on the practice of the participants. The literature reflects a need in all the health professions as an evaluative technique, have not been used to this point in pharmacy. There was a need for the exploration of their

¹For example, since 1975 three Canadian Provinces (Alberta, Saskatchewan and Manitoba) have required, or intend to require, mandatory participation by pharmacists in continuing education programs. See Canadian Pharmaceutical Journal reports of annual meetings 1975-1977.

application to pharmacy and further investigations of their evaluative powers.

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Chapter Two

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CHAPTER THREE

INSTRUMENT DEVELOPMENT

The purpose of the study was to evaluate a continuing pharmacy education program by measuring participant real-life behaviour change, gain in factual knowledge and satisfaction. As well, the predictive powers of written simulations were investigated. To accomplish the specific objectives associated with these purposes, a number of measurement instruments were developed. This chapter describes their development.

In-Store-Assessment Problems

Development

Four in-store-assessment-problems (ISAPs) were developed to enable a disguised evaluation of pharmacists as primary care consultants, at their place of employment. The ISAPs were developed around consumer requests for assistance on a health matter. Two of the problems concerned the request, "What is good for a cold?" and two concerned the request "What is the strongest pain reliever I may purchase without a prescription?" These two areas were chosen because assistance on "cold" and "pain" problems are among the most frequent primary care requests received by a pharmacist. Around each, a scenario was constructed describing the person with the problem, the symptoms, the individual's use of medications, the duration, and allergies. One "cold" problem and one "pain" problem were of a less serious nature and, therefore, it was appropriate for the pharmacist to recommend a product. The other two

problems were of a serious nature and warranted physician consultation. The problems always involved an individual asking on behalf of a friend or relative. The four problems are detailed in Appendix A.

Accompanying each ISAP, a list of plausible pharmacist responses to the problem was developed. The list attempted to be comprehensive and to include appropriate and inappropriate responses.

Panel of Content Experts

The four ISAPs and their corresponding list of behaviours were submitted to a ten-member panel of content experts for validation. These individuals are described in Appendix B. Three individuals were members of the Division of Clinical Pharmacy, Faculty of Pharmaceutical Sciences at U.B.C., who had experience in community pharmacy. The other seven were pharmacy practitioners who had varying amounts of community pharmacy experience.

Procedure for Rating the ISAPs

In the first meeting, the panelists were asked to rate the clinical importance, realism and plausibility of each problem and they were encouraged to suggest improvements. As well, they were asked to examine the list of behaviours for each ISAP and to suggest additions and deletions. They were then given the ISAPs and behaviours to take home. Over the next two weeks, they rated each behaviour as something a pharmacist: must do, should do, could do, should not do or must not do in accord with the criteria outlined in Table 1.

TABLE I

RATING CATEGORIES APPLIED TO PROBLEM SOLVING
ACTIVITIES TO ESTABLISH PERFORMANCE CRITERIA*

MUST DO	- The act is crucial to safe and effective patient care. Without exception it must be performed by the pharmacist.
Should Do	- The act further contributes to safe and effective patient care. It may be omitted only under certain circumstances, e.g., the patient already knows, or an emergency occurs in the store. NOTE: workload pressure is NOT sufficient justification for omission.
Could Do	- The act further contributes to safe and effective patient care. In general, however, the pharmacist need not perform it.
Should NOT Do	- The act is potentially bad for safe and effective patient care. It may mislead the patient causing excessive delay in treatment and an exacerbation of the illness.
Must NOT Do	- The act is clearly detrimental to safe and effective patient care. It has dangerous consequences for the patient.

*Modified Form: R. Jang. "Evaluation of the Quality of Drug-Related Services Provided by Community Pharmacists in a Metropolitan Area", Unpublished Ph.D. Dissertation, Ohio State University, 1971, p. 34.

After two weeks, a second meeting was held to discuss the ISAPs. Any new, relevant behaviours suggested by a panel member were rated by the other panel members.

The importance of each activity was determined by weighting each category. thus: must do = 5; should do = 4; could do = 3; should not do = 2; and must not do = 1. The mean, standard deviation, range and

interquartile range (Q-value) were calculated for each behaviour and are reported in Tables II to V in Appendix A.

Judges' Ratings of the ISAPs

The judges found the four ISAPs were feasible and did represent situations which can occur daily in community pharmacies. As well, they found the lists of pharmacist behaviours developed for each problem were adequate and realistic representations of possible responses to the particular primary care requests. The face validity of the ISAPs was thereby established.

The judges' ratings of the individual behaviours in the four ISAPs may be summarized in the following manner. For the 25 behaviours in ISAP one - cold appropriate - all ten judges were unanimous in their ratings of three behaviours, and in addition, at least six judges agreed on another 15 items. The greatest range for the judges' ratings, on any item, in this ISAP was two. ISAP two - cold inappropriate - had 27 behaviours, the ten judges were unanimous in their ratings of two behaviours, and at least six of the judges agreed on another 15. The greatest range for the judges' ratings, on any item, in this ISAP was three, occurring on only one item. There were 25 items in ISAP three - pain appropriate - three of which received unanimous ratings and 14 received the same ratings by at least six of the judges. The greatest range of the judges' ratings, on any item, in this ISAP was three, which occurred on two items. The ten judges were unanimous on two of the 24 items in ISAP four - cold inappropriate - and the majority agreed on another 15 items. The greatest range for the judges' ratings, on any

item, was two. (See Tables II to V in Appendix A). These results indicate that there was substantial agreement on what a pharmacist should or should not do in response to the primary care requests made in the ISAPs.

The uniformity of the judges' ratings was also studied in terms of the mean and standard deviation of the ratings of each judge on each problem. For the four ISAPs developed for this study, the judges' assessments range from 3.72 to 4.31, from 3.14 to 4.19, from 3.33 to 3.72 and from 32.5 to 3.72 for problems one to four respectively. A summary of these findings are presented in Table VI.

TABLE VI
MEANS AND STANDARD DEVIATIONS (S.D.) OF
JUDGES' WEIGHTINGS* OF THE BEHAVIOURS IN THE ISAPs

Judge	Cold Appropriate		Cold Inappropriate		Pain Appropriate		Pain Inappropriate	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1.	4.04	1.40	3.25	1.60	3.63	1.56	3.72	1.55
2.	3.81	1.29	3.50	1.45	3.35	1.46	3.50	1.43
3.	4.09	1.26	3.52	1.33	3.58	1.54	3.55	1.60
4.	4.31	1.12	4.19	1.17	3.72	1.38	3.68	1.49
5.	3.90	1.07	3.47	1.61	3.60	1.39	3.25	1.58
6.	4.00	1.23	3.40	1.59	3.47	1.56	3.68	1.61
7.	3.85	1.18	3.20	1.60	3.50	1.50	3.50	1.66
8.	3.96	1.46	3.42	1.65	3.50	1.59	3.68	1.67
9.	3.81	1.22	3.64	1.07	3.33	1.39	3.43	1.40
10.	3.72	1.32	3.14	1.23	3.46	1.29	3.36	1.40

*5 = Must do, 4 = Should Do, 3 = Could Do, 2 = Should Not Do, and
1 = Must Not Do.

Evidence indicating the extent of agreement among the judges on the weights to be assigned to the behaviours in the ISAPs is presented by the correlation coefficients in Table VII. The mean correlation coefficients among the judges' ratings for the behaviours in ISAP one - cold appropriate - was 0.83. The other mean correlation coefficients for the judges' ratings were 0.74 for cold inappropriate, 0.86 for pain appropriate and 0.84 for pain inappropriate. The mean correlation representing the extent of agreement among the ten judges over all items in all four problems was 0.81 (Table VIII, Appendix A). The results in Tables VI and VII provide corroboration that the judges had reasonably agreed upon the desirability of the behaviours suggested for each ISAP. Therefore, it was concluded that the ISAPs and their list of behaviours could be used to provide valid assessments of a pharmacist's primary care consulting behaviour.

Checklists

The behaviours associated with the ISAPs were used to construct a performance checklist for each. These checklists were used later to record the pharmacist's responses to the primary care request (see Appendix A).

Dual Function of the ISAPs

The ISAPs served two purposes: to evaluate the improvement in performance of the program registrants, and to test the predictive validity of the four simulations. The simulations completed between the times of pre- and post-in-store-assessment, were validated against an individual's performance on the ISAPs. Because the same situations could

TABLE VII
INTERCORRELATIONS OF JUDGES' RATINGS OF THE
BEHAVIOURS IN ISAPs ONE TO FOUR

Judge	In-Store- Assessment Problem *	1	2	3	4	5	6	7	8	9	10
1	One		.7941	.9112	.9266	.8805	.8844	.8537	.9100	.8713	.8363
	Two		.7560	.7623	.6481	.8711	.7933	.8851	.8829	.6626	.7434
	Three		.8352	.9008	.8548	.9519	.8676	.8932	.8990	.8947	.8608
	Four		.7478	.9485	.7848	.7840	.7824	.8548	.9574	.8936	.8173
2	One			.7344	.6922	.8031	.7689	.7654	.7488	.7910	.6955
	Two			.6271	.6792	.9137	.7735	.7478	.8753	.7481	.6487
	Three			.8259	.7703	.9016	.8585	.8262	.8881	.8810	.7831
	Four			.7171	.7649	.6459	.8912	.8298	.7812	.8259	.8857
3	One				.8429	.8619	.8164	.8446	.8743	.8107	.7855
	Two				.4144	.6654	.8711	.6906	.6321	.7150	.5799
	Three				.7751	.9367	.8138	.9409	.9233	.8254	.8945
	Four				.7301	.9678	.7399	.8343	.9438	.8857	.8190
4	One					.8201	.8903	.8318	.9207	.8389	.8624
	Two					.8557	.5144	.5815	.8023	.7640	.7410
	Three					.8018	.8895	.8907	.7533	.9138	.8123
	Four					.7567	.8648	.9545	.7967	.8891	.8792
5	One						.8214	.8187	.8593	.9049	.7701
	Two						.7308	.8299	.9248	.8040	.8249
	Three						.8779	.8805	.9197	.8670	.8811
	Four						.7005	.8198	.7896	.8503	.8920
6	One							.8965	.8808	.8167	.8790
	Two							.7133	.7785	.6213	.5955
	Three							.8333	.7829	.9129	.8098
	Four							.8642	.8067	.8441	.7914
7	One								.8494	.7711	.7726
	Two								.9074	.6260	.7578
	Three								.8827	.8856	.9016
	Four								.8859	.9447	.9258
8	One									.8753	.8342
	Two									.7320	.7341
	Three									.7871	.8725
	Four									.8986	.8047
9	One										.8276
	Two										.7075
	Three										.8725
	Four										.8885
10	One										
	Two										
	Three										
	Four										

*ISAP One = Cold Appropriate
ISAP Two = Cold Inappropriate
ISAP Three = Pain Appropriate
ISAP Four = Pain Inappropriate

not be used in a pre- and post-simulation - too much learning occurs in completing the first simulation - different ISAPs had to be used as the pre- and post-assessments. This fact created difficulties in making inferences about the effect of the educational program on real-life performance. Thus, four subsets of behaviours were selected which were common to both the pre- and post-ISAPs. These behaviours were used as the criteria for evaluating the pharmacist's performance and are indicated by asterisks in Tables II to V in Appendix A. The rationale for these subsets was to ensure maximum parallelism between the pre- and post-course evaluations.

The four behaviour categories employed were "data gathering", "inappropriate recommendations", "appropriate recommendations" and "drug-use-counselling". "Data gathering" consisted of those questions the panel of judges felt should be asked about the problem before recommending a course of action. The sections "appropriate" and "inappropriate recommendations" contain those pharmacist behaviours which, in the opinion of the judges were either acceptable or unacceptable solutions to the problems.¹ "Drug-use-counselling" contained those recommendations which the panel felt should accompany any non-prescription medication suggested. The distribution of behaviours in these subsets, over the four problems, is outlined in Table IX. From the data in Table IX, one can see that the two "cold" problems and the two "pain" problems are approximately parallel in terms of both the number and nature of items within each subset.

¹See page 119.

TABLE IX
THE DISTRIBUTION OF THE FOUR SUBSETS OF BEHAVIOURS
IN THE IN-STORE-ASSESSMENT PROBLEMS

IN-STORE- ASSESSMENT PROBLEMS	NUMBER OF BEHAVIOURS IN EACH CATEGORY			
	DATA GATHERING	INAPPROPRIATE RECOMMENDATIONS	APPROPRIATE RECOMMENDATIONS	DRUG-USE- COUNSELLING
1. COLD APPROPRIATE	8 ^a	7 ^b	2 ^c	4 ^d
2. COLD INAPPROPRIATE	8	7	2	4
3. PAIN APPROPRIATE	7	7	2	4
4. PAIN INAPPROPRIATE	7	7	2	4

- a. The "data gathering" behaviours are identical within the cold and within the pain problems.
- b. The majority of "inappropriate recommendations" are identical, some however are problem dependent.
- c. "Appropriate recommendations" are problem dependent and, therefore, not the same in any problem.
- d. "Drug-use-counselling" behaviours are the same in all four problems.

Scoring System Assigned to the ISAPs

Agreements among the judges about appropriate weights for each item, were used to sort the items into "desirable" and "undesirable" actions. Arbitrarily, those with a mean rating greater than 3.20 were classified as desirable actions and those with a mean rating of less than 2.80 were classified as undesirable actions. Logically all items in the "data gathering", "appropriate recommendations" and "drug-use-counselling" subsets were desirable activities and all items in the "inappropriate recommendations" subset were undesirable activities.

After sorting the items, a standardized scoring system was used for all four ISAPs. A value of 1 was assigned to all behaviours in the

"data gathering" and "drug counselling" sections. A value of -1 was given to all behaviours in the "inappropriate recommendations" section. For the "appropriate recommendations" section, the following values were assigned to the behaviours, a 2 to the first item and a 1 to the second item. The first item represented the ideal recommendation and the second item represented an acceptable alternative given the symptoms, drugs being used, etc.

The overall performance scores were obtained by summing the values assigned to the behaviours performed. The maximum score for cold problems was 14 and for the pain problems was 13.

Observers

Eight graduate students in adult education were trained as the observers who were to present the ISAPs. Of the eight individuals, six were female and two were male and their ages ranged from 31 to 53, with a mean age of 38. Each observer was given approximately four hours of training. This consisted of role playing in which they worked in pairs and took the role of the consumer and then the role of the pharmacist for each ISAP situation. This was repeated until they felt comfortable with their roles. Each individual had to play satisfactorily all four situations for the investigator. The observers were then assigned the name of a community pharmacist in Vancouver in which to pilot-test one of the situations. At a subsequent meeting any problems encountered during the pilot-test were discussed.

The observers watched four videotapes of simulated consumer-pharmacist interaction concerning a primary care request. These

videotapes were developed around situations identical to the four ISAPs. After viewing each videotape, the trainees completed the corresponding performance checklist for that ISAP. In addition, for each videotape, the trainees were asked related questions such as "How many customers did you see?" or "How many individuals were in the dispensary?" Each individual's checklist and answers to the auxiliary questions were compared with what actually occurred in the videotape and the inter-rater reliability for each situation was calculated.

Reliability of the Observers

The mean percentage agreement among the eight observers to what actually occurred on each of the four videotapes was 85.50, 74.57, 66.71 and 74.59 and for the 103 items in all four videotapes, the mean agreement was 75.51 percent (Table XVII). Approximately 75 percent agreement among the observers is somewhat low, however, the investigator was confident that these percentages would have been considerably higher had there been better quality audio on the videotapes. Therefore, these findings were accepted as evidence that the observers were accurate and dependable in their observations.

Of the eight observers, four were used in both the pre- and post-course assessment. Two observers who collected pre-course data were unavailable for post-course data collection. Two observers were trained to take their places. For the six observers who collected the pre-course data there was a mean of 77.49 percent agreement with the four videotapes and for the six observers who collected the post-course data there was a mean of 75.06 percent agreement. There is no

TABLE XVII

ACCURACIES OF EIGHT OBSERVERS FOR EACH OF FOUR VIDEOTAPES USED IN THE TRAINING
PROCEDURE

OBSERVER	ALL FOUR VIDEOTAPES (103) ¹	COLD APPROPRIATE VIDEOTAPE (25)	COLD INAPPROPRIATE VIDEOTAPE (27)	PAIN APPROPRIATE VIDEOTAPE (25)	PAIN INAPPROPRIATE VIDEOTAPE (26)
1	78.53	100.00	79.66	70.01	67.70
2	76.93	87.06	75.00	71.40	73.19
3	76.02	73.85	54.77	76.28	100.00
4	79.82	61.24	88.83	73.60	83.75
5*	78.12	100.00	79.72	76.13	60.31
6*	75.57	100.00	78.11	50.71	79.06
7**	70.00	88.85	68.47	54.24	69.53
8**	69.11	73.85	72.06	61.38	63.25
Mean	75.51	85.60	74.57	66.71	74.59

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¹ - Number of items considered

* - Pre-course data collection only

** - Post-course data collection only

TABLE XVIII

INTER-OBSERVER RELIABILITY ON ALL 103 ITEMS OF THE FOUR VIDEOTAPES

<u>OBSERVER</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
1		.8141	.6690	.7445	.7401	.8055	.6679	.7983
2			.6131	.6836	.7372	.7567	.7543	.8225
3				.7325	.6565	.6133	.6012	.6654
4					.7928	.7220	.5828	.6797
5						.7502	.7404	.7277
6							.7263	.6805
7								.7182
8								

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Mean correlation coefficient = 0.7119

significant difference between the two means. It was concluded that each group of observers would be equally accurate in their observations.

The inter-rater reliability was calculated for the eight observers over the entire 103 questions asked about the videotapes (Table XVII). The mean correlation coefficient was 0.7110, and was interpreted as acceptable inter-observer reliability.

Written Simulations

Development

One of the objectives of this study was to develop written simulations which would be suitable for evaluating a pharmacist's performance in the area of primary care consulting. Four simulations matching the four ISAPs were prepared by the investigator. Two dealt with consumers asking for assistance on a "cold" problem and two dealt with a "pain" problem. The simulations were constructed so that the symptoms, drug complications and recommended solutions approximated, as closely as possible, the ISAPs described previously. This matching of the simulations and the ISAPs is outlined in Table X. The contents of the written simulations and ISAPs were matched to enable a test of the predictive validity of the simulations.

TABLE X
MATCHING OF WRITTEN SIMULATIONS TO THE
IN-STORE-ASSESSMENTS (ISAPs)

CONTENT	WRITTEN SIMULATION	IN-STORE-ASSESSMENT PROBLEM	PHYSICIAN CONSULTATION
1. "COLD"	ONE	ONE	NOT WARRANTED
	TWO	TWO	WARRANTED
2. "PAIN"	THREE	THREE	NOT WARRANTED
	FOUR	FOUR	WARRANTED

The simulations used the latent image technique which has been described by McGuire (4). With the latent image format, the response to the questions asked and the consequences of actions taken are usually on a separate sheet of paper and are invisible. They are developed with the use of a special pen. The information gained from taking a specific action and developing the latent image response enables the individual to proceed with solving the problem. The general principles and procedures described in a manual for the preparation of written simulations were followed (3). The simulations employed a branching format which allowed an individual to follow one of several routes to a solution.

Procedure for Rating the Simulations

Written simulations listing the options available to the pharmacist and all of the possible responses were submitted to the panel of judges. The panelists were asked to edit the simulations for correctness

of content and to suggest ways of improving their realism. They were asked to rate each option according to the criteria employed for the ISAPs outlined in Table I.

At a second meeting, any problems encountered in this process were discussed and weights were assigned to any new options suggested.

The same values used for weighting the assigned categories in ISAPs were used with the simulations (1 through 5 values for Must not Do - Must Do). The mean, standard deviation, range, interquartile range (Q value) were calculated. Panelists were contacted by phone to resolve any ambiguities about an option with a Q value exceeding 1.50. Pearsonian correlations were generated to represent the extent of agreement among panelists.

The mean of the judges' rating was used to assign a scoring weight to each option in a simulation (Table XI).

TABLE XI

THE MANNER IN WHICH SCORING WEIGHTS WERE
ASSIGNED TO THE OPTIONS IN THE SIMULATIONS

MEAN RATING	SCORING WEIGHT ASSIGNED
1.00 - 1.50	-2
1.51 - 2.50	-1
2.51 - 3.50	0
3.51 - 4.50	1
4.51 - 5.00	2

An optimal route through each simulation was devised incorporating suggestions made by the panel of judges. The maximum score

obtainable by following the optimal route was calculated for scoring purposes. Samples of the four written simulations, including all the responses contained in the latent images, and outlines of the possible paths through each problem are shown in Appendix C.

Validity of the Simulations

The means and standard deviations of the judges' ratings for the four simulations are contained in Table XII. As well, this table contains the means and standard deviations of the judges' ratings of the total 267 options in all four simulations. A majority (at least six out of ten) of the judges agreed on the ratings of 127 of the 267 items (47.56 percent). In addition, all ten judges agreed on the ratings of 15 (5.61 percent) of the items. In over 50 percent of the items at least 6 of the judges assigned the same weight.

TABLE XII

MEANS AND STANDARD DEVIATIONS (S.D.) OF THE JUDGES' WEIGHTINGS* OF THE OPTIONS IN THE VARIOUS SIMULATIONS

Judge	Cold Appropriate		Cold Inappropriate		Pain Appropriate		Pain Inappropriate		All Simulations Combined	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1.	3.29	1.61	3.19	1.59	3.25	1.46	3.02	1.53	3.19	1.54
2.	3.31	1.25	3.39	1.18	3.13	1.16	3.02	1.28	3.23	1.22
3.	2.84	1.38	2.85	1.36	3.32	1.27	3.38	1.30	3.06	1.35
4.	3.06	1.51	3.33	1.02	2.95	1.47	3.18	1.36	3.13	1.36
5.	3.05	1.13	3.36	1.01	3.13	1.23	3.09	1.26	3.15	1.15
6.	2.96	1.60	3.30	1.48	3.21	1.33	3.15	1.46	3.14	3.48
7.	3.00	1.48	3.21	1.44	2.95	1.50	3.16	1.49	3.07	1.47
8.	3.12	1.48	3.23	1.20	2.95	1.34	2.88	1.40	3.05	1.36
9.	2.78	1.26	3.24	0.80	2.93	1.23	3.07	0.98	2.99	1.10
10.	2.89	1.63	3.15	1.72	3.03	1.74	2.79	1.83	2.97	1.73

*5 = Must Do, 4 = Should Do, 3 = Could Do, 2 = Should Not Do, 1 = Must Not Do.

Sedlacek and Nattress (5) felt that an estimate of the validity of written simulations could be obtained by calculating inter-judge agreement. In addition, they suggested that if there was a high degree of agreement among the judges then weights could be assigned to the response options based on the mean judgements of the experts for each option. If such a scoring system was used, a total score for each individual completing the simulation could be calculated.

The inter-judge agreement on the weightings of options for the respective simulations are displayed in Table XIII. The average correlation coefficients 0.78, 0.68, 0.73, and 0.74 calculated for the four

simulations represent a high level of inter-judge of agreement. The average correlation coefficient for the judges' ratings of the entire 267 options in all four simulations was 0.73 (Table XIV Appendix C).

TABLE XIII
INTERCORRELATIONS OF JUDGES RATINGS OF THE
BEHAVIOURS IN SIMULATIONS ONE TO FOUR

Judge		1	2	3	4	5	6	7	8	9	10
	Simulation*										
1	One		.7634	.8083	.8549	.7995	.8224	.8899	.7276	.7949	.8008
	Two		.7892	.8843	.7193	.7328	.7818	.7981	.5228	.6299	.8276
	Three		.7342	.8245	.7438	.7485	.6295	.7965	.7745	.6470	.7147
	Four		.8701	.8387	.8202	.7977	.6683	.8555	.7446	.6906	.8054
2	One			.7158	.7183	.7694	.7889	.7662	.6899	.6991	.8195
	Two			.7528	.6850	.7710	.7495	.6822	.5002	.6873	.8032
	Three			.6941	.7735	.8108	.5649	.7656	.6876	.7179	.7790
	Four			.7895	.8195	.8123	.6383	.8756	.7159	.7285	.7750
3	One				.8679	.8202	.7755	.8144	.6421	.8464	.7276
	Two				.6785	.6667	.7602	.7261	.5898	.5897	.7549
	Three				.7152	.7199	.5939	.7468	.6732	.6227	.7138
	Four				.7140	.7722	.6984	.7804	.7231	.7423	.7287
4	One					.8086	.8018	.8172	.6644	.8474	.7888
	Two					.8096	.6273	.7251	.5239	.6080	.6469
	Three					.8417	.5622	.9463	.7718	.7915	.7423
	Four					.7714	.6822	.8407	.7243	.6855	.6875
5	One						.7681	.8280	.7656	.7997	.8267
	Two						.5971	.6865	.6187	.6802	.6935
	Three						.5335	.8777	.7672	.8579	.7831
	Four						.6073	.7954	.6765	.6618	.6678
6	One							.7995	.6648	.8109	.8585
	Two							.7175	.5843	.6187	.8624
	Three							.6019	.7470	.6296	.6022
	Four							.7113	.7297	.7653	.7196
7	One								.7064	.7842	.7896
	Two								.5735	.5478	.7401
	Three								.8392	.8204	.7583
	Four								.6649	.7041	.7877
8	One									.7065	.7478
	Two									.5626	.6407
	Three									.8136	.7020
	Four									.7283	.6501
9	One										.8205
	Two										.5626
	Three										.6816
	Four										.6661
10	One										
	Two										
	Three										
	Four										

*Simulation One = Cold Appropriate
Simulation Two = Cold Inappropriate
Simulation Three = Pain Appropriate
Simulation Four = Pain Inappropriate

From the data presented in these tables, it was felt that there was an acceptable level of agreement among the ten judges. This, according to Sedaleck and Nattress (5), provides an estimate of the validity of the four simulations and allowed weights to be assigned to the options within the simulations to enable further validity testing.

More direct evidence of the validity of the simulations is presented in the form of criterion group validity data (Table XV). Each problem was administered to four groups of individuals who had varying degrees of knowledge about the use of non-prescription drugs. The groups were: first year psychology students (N=118), first year pharmacy students (N=107), final year pharmacy students (N=93) and practising pharmacists (N=87). If the problems have criterion group validity, the first year psychology students should score low and the final year pharmacy students and/or the practising pharmacists should score high. In all four problems, the trend was, as one would expect, psychology students scored the lowest and the fourth year students or the practising pharmacists scored the highest. In only one problem, number three, did the first year pharmacy students score higher than the fourth year pharmacy students.² The data in Table XV indicates that the scores derived from the simulations do vary as expected with different levels of expertise as a pharmacist.

Table XVI presents the t-probabilities for significant differences

²This was an artifact due to an error in the directions within problem three which prevented an individual from reaching the optimal solution. As the fourth year students were the first test group to complete the simulations their scores would be low on this problem. It was corrected for subsequent groups.

TABLE XV
CRITERION GROUP VALIDITY DATA FOR WRITTEN
SIMULATION PROBLEMS

Groups	Simulation One ^a MPS = 42.0 ^e		Simulation Two ^b MPS = 36.0		Simulation Three ^c MPS = 34.0		Simulation Four ^d MPS = 27.0	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Psychology 100 Students	13.35(29) ^f	6.22	7.07(30)	10.68	6.97(30)	7.68	15.55(29)	6.38
First Year Pharmacy Students	17.90(29)	9.69	12.47(32)	11.93	15.36(28)	7.88	15.61(28)	7.37
Fourth Year Pharmacy Students	22.86(22)	9.40	16.96(24)	10.62	12.85(26)	9.60	19.52(21)	3.11
Graduate Pharmacists ^g	23.45(12) (10)	8.85	23.07(14) (10)	7.65	19.34(10) (11)	7.56	18.34(12) (8)	4.83

a Cold appropriate, i.e., appropriate to recommend a non-prescription product

b Cold inappropriate, i.e., inappropriate to recommend only a non-prescription product

c Pain appropriate, i.e., appropriate to recommend a non-prescription product

d Pain inappropriate, i.e. inappropriate to recommend only a non-prescription product.

e Maximum possible score

f Numbers in parenthesis indicates individuals completing problems

g Mean of two groups of practising pharmacists

in the performances of the four groups on the written simulations. The scores of the psychology students are significantly lower than the fourth year pharmacy students on all four problems. As well, their scores were significantly lower on three of the four problems when compared to those of the graduate pharmacists. There are significant differences between the performances of the first year pharmacy students and those with more education and experience in pharmacy.

The data presented in Tables XV and XVI give additional support to the validity of the four simulations.

TABLE XVI

t-PROBABILITIES FOR SIGNIFICANT DIFFERENCE IN
PERFORMANCE OF CRITERION GROUPS ON WRITTEN SIMULATIONS^T

Group		First Year Pharmacy Students	Fourth Year Pharmacy Students	Graduate Pharmacists
<u>Simulations</u>				
Psychology 100 stu- dents	One	0.055	0.000*	0.000*
	Two	0.063	0.001*	0.000*
	Three	0.000*	0.012*	0.000*
	Four	0.926	0.006*	0.117
First Year pharmacy students	One		0.056	0.036*
	Two		0.146	0.000*
	Three		0.305	0.067
	Four		0.015*	0.141
Fourth Year pharmacy students	One			0.802
	Two			0.018*
	Three			0.015*
	Four			0.295

*Significant at 0.05 level.

1. Simulation one = cold appropriate, two = cold inappropriate, three = pain appropriate and four = pain inappropriate.

Tests For Factual Knowledge

To measure the gain in factual knowledge by the individuals who participated in the continuing pharmacy education programs, tests were prepared. All the instructors involved in the program were asked to prepare instructional objectives (2) before designing their presentations. The instructors for "cold" and "pain" were to choose those objectives they felt most important and prepare tests for factual knowledge on the content. The tests consisted mostly of multiple choice questions but some included true or false questions. Two forms of each test were developed, a pre-and a post-test. Both tests contained the same questions but in different sequences, and with different orderings of alternatives.

These tests were pre-tested on pharmacists enrolled in similar continuing education programs in other localities in the province. These results were analyzed to identify the questions with the best discriminating powers. Those items which were found to be the most "learnable" and to have the highest point bi-serial correlation with test content were retained for the final version of the tests (see Appendix D).

Participants' Evaluation of the Program

A magnitude estimation scaling technique was used to ascertain the participants' reaction to the course (1). Participants were asked to compare aspects of this course with ones attended in the past. As well, they were asked to estimate the amount of learning attributable to components of this course in comparison to that attributable to a

standard 30 minute lecture.

This evaluation form is shown in Appendix E.

References

Chapter Three

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3. Manual for Northern Illinois Workshop: Construction of Written Simulations. Research and Evaluation Section, Center for Educational Development, University of Illinois College of Medicine, Chicago, Illinois, 1973.
4. McGuire, C.H. and F.H. Wezeman, "Simulation in Instruction and Evaluation in Medicine" in Educational Strategies for the Health Professions. Edited by G.E. Miller and T. Fulop, Public Health Papers #61, World Health Organization, Geneva, 1974, 18-34.
5. Sedlacek, W.E. and L.W. Nattress, "A Technique for Determination of the Validity of Patient Management Problems." Journal of Medical Education 47 (1972): 263-266.

CHAPTER FOUR

METHODOLOGY

The two principal research questions addressed in this study were: (a) "Did a continuing education course change the behaviours of the individuals enrolled?" and (b) "Did the written simulations developed for this investigation predict real-life behaviour?" In addition, the following secondary questions were investigated:

1.) "Was there a relationship between the scores on a factual knowledge test and performance on written simulations?" 2.) "Was there a relationship between the scores on a factual knowledge test and performance on the in-store-assessments?" 3.) "What were the reactions of the participants to the educational program?" This chapter describes the methodology employed in this study's approach to these questions.

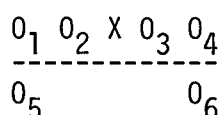
Design of the Study

To answer the principal questions, a modification of the quasi-experimental research design known as the "non-equivalent control group" was adopted (1). In this design there is an experimental group and a control group, but "the control group and the experimental group do not have pre-experimental sampling equivalence" (1, p. 47). This design is represented schematically in Figure 1.

To answer the first question, the educational program was the independent variable and the primary care consulting behaviour was the dependent variable. This design enabled a measurement of the influence

of participation in the continuing education program on the primary care consulting behaviour of the pharmacist participants. To answer the second principal question, the relationship between the performance on the matching ISAP and the written simulation was investigated.

Fig. 1. Experimental Design



Where: X is the instruction
O₁ is the pre-course in-store-assessment of the experimental group
O₂ is the pre-instruction written simulation
O₃ is the post-instruction written simulation
O₄ is the post-course in-store-assessment of the experimental group
O₅ is the pre-course in-store-assessment of the control group
O₆ is the post-course in-store-assessment of the control group

Data collected during the educational program enabled a further investigation of the secondary questions outlined in the introduction to this chapter.

Subjects

The experimental subjects (N=34) were among the participants in the continuing education course held in Victoria and Duncan, B.C. as part of the regular continuing education activities of the Faculty of Pharmaceutical Sciences, U.B.C.

A non-equivalent control group (N=40) was randomly selected

from the registration list of the College of Pharmacists of British Columbia. Only pharmacists on record at the College as working in Vancouver, B.C. were included. Pharmacists working in the Chinatown area of the city were excluded. As well, any pharmacist who either attended this continuing education program when offered the previous fall or who worked in a store with someone who previously attended the course, was excluded. They were eliminated because they would have access to much of the course material which could possibly influence their behaviour between the pre-course and post-course assessment. Of the 40 control subjects one was dropped from the study because she referred the observer to another pharmacist.

Demographic Data on Subjects

Demographic data were collected and compared to determine equivalency between the groups of subjects. The data were obtained from the files of the British Columbia College of Pharmacists and included age, sex, birthdate, employee position in the pharmacy, degree or diploma status, where and when obtained, additional university qualifications, additional qualifications other than university, and Pharmacy Examining Board of Canada status. In addition, whether an individual worked in an independent or chain store and his or her membership in pharmacy organizations were recorded.

Continuing Education Program

The continuing education course was an evening lecture series offered in Duncan, B.C. on Tuesday and on Wednesday in Victoria. The same instructors gave both sessions. The program consisted of two-hour

sessions, one night per week, for eight consecutive weeks. An overview of the program content is presented in Table XIX.

TABLE XIX
OUTLINE OF THE CONTENT OF PROGRAM BY SESSION

<u>Session</u>	<u>Topic</u>
One	A. Schedule A, Part III Drugs (Non-prescription drugs) B. Advising Patients - Getting the facts
Two	A. Ophthalmics, Otics B. Contact Lens Solutions
Three	A. Antacids B. Dental Products
Four	A. Laxatives B. Antidiarrheal Preparations
Five	A. Cough Medications
Six	A. Cold Medications
Seven	A. Analgesics B. Sleep Aids
Eight	A. Liniments, Hemorrhoidal Preparations B. Sunscreen, Burn Products

Part A of the first evening outlined new legislative changes to the B.C. Pharmacy Act that increased the pharmacist's responsibility for controlling public access to some non-prescription medications. Part B, that evening, dealt specifically with communication skills, such as effective listening and questioning strategies. Evenings Two through Eight involved discussions of common problems in selected therapeutic areas which are often brought to pharmacists for advice. Included in each session was a discussion on the etiology of common ailments, the most

prevalent symptoms and the key questions to help differentiate the seriousness of the complaints. These points were emphasized by the instructor and by video-tapes of simulated consumer-pharmacist encounters.

The Program Emphasis

The instructors were also asked to emphasize the following list of recommended behaviours. In response to a primary care request the pharmacist will:

- (1.) respond to the request himself or direct the consumer to another trained health professional,
- (2.) obtain a brief history before proceeding on any course of action,
- (3.) include in that history questions about the symptoms,
- (4.) ask about allergies to drugs, etc.,
- (5.) ask about concurrent use of prescription drugs,
- (6.) ask about concurrent use of non-prescription drugs,
- (7.) recommend a product which is compatible with facts ascertained in steps three to six,
- (8.) when warranted recommend that the individual seek physician advice and not recommend a non-prescription medication,
- (9.) provide precautions about relevant side effects of any medications recommended,
- (10.) suggest proper method for use (dosage, instillation of drops, sprays, etc.),

- (11.) suggest the limitations of self-medication (that is, how long to take and when to see a physician).

Instruments

The written simulations and the ISAPs discussed previously were employed to measure the above behaviours when a pharmacist responded to a request for assistance on a "cold" problem and a "pain" problem. Tests for factual knowledge were also developed for the sessions on "pain" and "cold".

Instrument Assignment

The ISAPs were assigned to experimental and control subjects in the following manner: program participants were asked to pre-register; and the first registrant was assigned to problem one, the second to problem two, the third to problem three, the fourth to problem four, the fifth to problem one and so on. As the control group was selected, they were assigned problems according to the same system. However, there were some instances, both in the control, and the experimental groups, where two pharmacists worked at the same pharmacy. In this case, one would be given a "cold" problem and the other a "pain" problem to insure the unobtrusive nature of this phase of the data collection.

Every evening during the continuing education program, the participants received a personal registration kit. Each night this contained a pre-test for factual knowledge and any lecture outlines or other materials for that evening's instruction. In order to assure that individuals received written simulations which corresponded to the pre-course ISAP on "cold" or "pain", matching simulations were placed

in the registration kits. The post-course written simulation was mailed to each individual and matched the post-course ISAP used to assess the registrant. Only the experimental subjects completed written simulations.

Observers

Eight graduate students were employed as the observers for the in-store-assessments. They were not told which pharmacists comprised the control and experimental groups and the same observer was never utilized to do both the pre-and post-course assessment of any one pharmacist. The directions given the observers for the in-store-assessments are contained in Appendix A.

Procedure for Data Gathering

The data collected for both the experimental and control groups included pre-and post-course in-store-assessments and demographic data relating to an individual's career in pharmacy. For the experimental group only, the following additional data were collected: pre-and post-instruction tests for factual knowledge, pre-and post-instruction performance on written simulations and a subjective evaluation of the education program. An outline of the sequence of data collection is presented in Figure 2.

The pre-course in-store-assessments were performed on the experimental group as the individuals pre-registered. This group was assessed between February 27th and March 17th, 1976. Of the 34 experimental subjects, 28 pre-registered and were assessed before being exposed to any instruction. Four individuals, who did not pre-register, attended the first evening and were assessed between the first and

Session

Two Pre-Test
Instruction
Post-Test

Three	Pre-Test	Instruction	Post-Test
-------	----------	-------------	-----------

P	Four	Pre-Test
R		Instruction
O		Post-Test

GRAM	Five	Pre-Test
		Instruction
		Post-Test
		Practice Simulation

Six

Pre-Test
Simulation
Instruction
Post-Test

Seven

Pre-Test
Simulation
Instruction
Post-Test

Eight Pre-Test
Instruction
Post-Test
Evaluation

PROGRAM POST

POST-COURSE SIMULATIONS

POST-COURSE IN-STORE-ASSESSMENT

second week. Two individuals, who did not pre-register, attended the second evening and were assessed between the second and third week. The scores of these six individuals were well within the range of the other participants' scores and so were included in the final sample. The control group was assessed between February 25th and March 19th, 1976.

All assessments were performed in an unobtrusive manner, with the trained observers posing as regular customers. In these assessments, the observers were instructed to make sure the assigned pharmacist was on duty and to verify the identity by having one of the clerks identify him or her before administering the problem. All the situations concerned a friend or relative and the observers were to act concerned but not worried. They were to answer any of the pharmacist's questions with the information provided with each problem. They were not to volunteer any information. They were to buy the recommended product and leave the store and complete the performance checklist (Appendix A). The pharmacist's performance was scored at a later date by the investigator.

In addition to the performance checklist, situational data¹ and a physical description² of the pharmacist were recorded by the observer including: sex, height, weight, age, hair colour, build, etc.; length of time spent with the pharmacist; whether he/she appeared busy; the number of pharmacists on duty, number of clerks on duty; number of customers at

¹The situational data were recorded to rule out environmental factors which might account for a pharmacist's performance.

²This enabled the investigator to double check the identity of the pharmacist assessed.

the prescription counter, in the whole store, at cash register one and at cash register two. They were also to complete two semantic differential scales describing the pharmacist's treatment of them as a person and of their non-prescription medication request. (See Appendix A for copy of this record sheet.)

During the educational program itself, additional data were gathered on the experimental group. Each evening of the class the pharmacist completed the pre-and post-tests for factual knowledge. These were self-graded by the pharmacist and handed in at the end of the evening. In the intervening week they were checked to see that they had been marked properly and analyzed to produce a distribution of scores and a mean and standard deviation for each set of tests.

To acquaint participants with written simulations and the latent image format, on the fifth evening, as the last task, they were given a practice simulation. On the subsequent two evenings, they completed simulations on "cold" and "pain" which were distributed in such a manner (via the registration kits) that the simulation received matched the pre-course ISAP. As the last activity of the course (evening eight) the participants completed a course evaluation form (see Appendix E).

On May 19th, 1976, two post-course simulations were mailed to each pharmacist registered in the course, one of which matched the post-course ISAP. This mailing produced a sixty percent return. A second mailing was conducted on May 31, 1976. This was followed in two weeks by a telephone call to all non-respondents. A total of 32 out of a possible 34 returns were obtained. Two of the returned simulations

were unusable because the individuals developed more than the appropriate number of latent images.

The post-course in store assessments for the experimental group were performed between June 7th and June 25th, 1976.³ The control group was assessed between May 31st and June 29th, 1976.⁴ For both the pre-and post-in-store-assessments, the total test score, its four component sub scores, and the situational data were analyzed for significant gains and relationships.

Data Analysis

The data were analyzed on the IBM 360 computer at the University of British Columbia using programs appropriate at each stage.

The demographic data were analyzed by preparing bivariate frequency tables and calculating Pearson's Chi square as a test of significance for the distribution of cases within the cells of the tables. This permitted an examination of the equivalency of the control and experimental groups.

The mean and standard deviations of the multiple choice test scores were calculated. In addition, t-tests for paired comparisons were performed to determine the significance of the gain between the pre-and post-test scores.

The mean and standard deviations were calculated for the pharmacists' total performance scores on each simulation.

³The one exception was on July 20th, 1976 for an individual who was on vacation during the period.

⁴Four individuals, who were on vacation, were assessed between July 6th to 8th, 1976.

The significance of the gain between the pre-and post-course in-store-assessments were determined by performing the t-test for paired comparisons.

The extent of association between (a) the situational factors present during the in-store-assessment with an individual's ISAP performance score, (b) the scores for factual knowledge with performance on the ISAPs, and (c) the scores for factual knowledge with performance on written simulations were determined by calculating Pearsonian correlations.

To identify the relationship between performance on the ISAP and performance on the written simulations, Pearsonian correlations were calculated for the total performance scores. In addition, a consistency score representing the agreement between what an individual did or did not do in real-life, with what he or she did or did not do on the written simulation was calculated. The score was determined by comparing an individual's performance on the items in the ISAP with the corresponding items in the simulations. If an individual performed an activity on a measurement, it was recorded as a one. If an individual did not perform an activity on a measurement, it was recorded as a zero. A percentage was then calculated by comparing the agreement between the ones and zeros on the corresponding items.

References

Chapter Four

1. Campbell, D.T. and J.C. Stanley, Experimental and Quasi-Experimental Designs for Research, Chicago: Rand McNally College Publishing Company, 1963.

CHAPTER FIVE

RESULTS AND DISCUSSIONS

Initially, this chapter presents data with respect to the equivalency of the two research groups. The remainder of the chapter is devoted to an analysis and discussion of the data to answer the research questions stated in the previous chapter.

Demographic Data for Controls and Experimental Groups

To establish the degree of "equivalency" between the control group and experimental group, demographic data were recorded on the individuals in each group. (See Table XX.)

TABLE XX

DEMOGRAPHIC COMPARISONS FOR CONTROL AND
EXPERIMENTAL SUBJECTS

<u>VARIABLE</u>	<u>PEARSON'S CHI-SQUARE</u>	<u>CHI PROBABILITY</u>
Country of birth	0.46	0.50
Province of birth	1.99	0.58
Sex	1.39	0.24
Marital Status	0.83	0.67
Employed in more than one Pharmacy	1.79	0.41
Diploma	5.74*	0.02
Province where diploma obtained	7.80*	0.01
Degree	5.74*	0.02
Province where degree obtained	0.02	0.85
Additional degrees	0.02	0.85
Additional diplomas	0.67	0.42
Additional qualifications	0.00	0.95
Pharmacy Examining Board of Canada Status	7.09*	0.03
Membership in: B.C. Pharmaceutical Society	2.42	0.12
Canadian Society of Hospital Pharmacists	0.00	0.95
Registration in other provinces	1.46	0.22
Employment Status	3.17	0.38
Hours of work per week	3.30	0.35
Type of Store	1.07	0.59

*Significant

The control group had significantly more people who received their license to practice pharmacy after completing a diploma course. More of these individuals received their diplomas from a province other than

British Columbia. There were significantly more individuals in the experimental group who had received university degrees in pharmacy. As well, a significantly larger number of pharmacists in the experimental group have received their Pharmacy Examining Board of Canada Certificate.

Although the two groups were not randomly selected from the same population, the data in Table XX indicated that they were equivalent on a number of demographic variables. For those variables for which there were significant differences, none should affect an individual's ability to learn and therefore could not be used to explain away any gain in either of the group's performances on the in-store-assessments.

In addition, t-tests for significant differences between the two groups were performed on the year of birth, the year of graduation with a diploma and the year of graduation with a degree. There were no differences significant at the 0.05 level of significance.

Improvement in Real-Life Performance

In this study four primary care requests were used as the pre-in-store-assessment tests and the same four primary care requests were used as post-in-store-assessment tests. Although an individual did not receive the same problem as both the pre- and post-test, he or she did receive the identical problem type, i.e., two cold problems or two pain problems. The maximum score one could obtain with the two cold problems or with the two pain problems is the same.

To test for the equivalence of the two different ISAPs which dealt with cold, the components' scores on the in-store-assessments were compared across the "cold" problems (Table XXI). The components of the

TABLE XXI

COMPARISON OF THE COMPONENT SCORES FOR THE TWO COLD IN-STORE-ASSESSMENT PROBLEMS
FOR THE EXPERIMENTAL AND CONTROL GROUPS

EXPERIMENTAL GROUP PRE-IN-STORE-ASSESSMENT

COMPONENTS	MEAN PERFORMANCE SCORES		t-VALUE	D.F.	t-PROB ¹	F-PROB ²
	COLD APPROPRIATE	COLD INAPPROPRIATE				
1. DATA GATHERING	2.25	2.86	-0.93	20	0.37	0.90
2. INAPPROPRIATE RECOMMENDATIONS	-1.00	-0.86	**			
3. APPROPRIATE RECOMMENDATIONS	0.00	0.36	**			
4. DRUG-USE-COUNSELLING	0.88	2.15	-2.61	19	0.02*	0.08
5. TOTAL SCORE	2.12	4.35	-1.96	20	0.06	0.22

CONTROL GROUP PRE-IN-STORE-ASSESSMENT

COMPONENTS						
1. DATA GATHERING	2.23	1.82	0.68	22	0.51	0.78
2. INAPPROPRIATE RECOMMENDATIONS	-1.23	-1.00	**			
3. APPROPRIATE RECOMMENDATIONS	0.16	0.00	**			
4. DRUG-USE-COUNSELLING	0.62	0.82	-0.54	22	0.60	0.26
5. TOTAL SCORE	1.77	1.55	0.24	22	0.80	0.83

EXPERIMENTAL GROUP POST-IN-STORE-ASSESSMENT

COMPONENTS	MEAN PERFORMANCE SCORES		t-VALUE	D.F.	t-PROB	F-PROB
	COLD INAPPROPRIATE	COLD APPROPRIATE				
1. DATA GATHERING	3.60	3.14	0.61	20	0.55	0.26
2. INAPPROPRIATE RECOMMENDATIONS	-0.75	-0.85	-0.47	20	0.65	0.73
3. APPROPRIATE RECOMMENDATIONS	0.63	0.71	-0.19	20	0.83	0.39
4. DRUG-USE-COUNSELLING	1.75	2.43	-1.02	20	0.32	0.55
5. TOTAL SCORE	5.25	5.42	-0.11	20	0.88	0.76

CONTROL GROUP POST-IN-STORE-ASSESSMENT

COMPONENTS						
1. DATA GATHERING	1.69	2.36	-1.01	22	0.32	0.94
2. INAPPROPRIATE RECOMMENDATIONS	-1.00	-1.09	-0.47	22	0.65	0.94
3. APPROPRIATE RECOMMENDATIONS	0.15	0.09	0.33	22	0.74	0.06
4. DRUG-USE-COUNSELLING	0.46	1.09	-1.18	22	0.25	0.94
5. TOTAL SCORE	1.31	2.36	-1.10	22	0.29	0.70

1. t-Probability. A t-probability of 0.05 or less represents a significant difference.

2. F-Probability. A F-probability of 0.05 or less indicates that the sample variances are significantly different and therefore come from different populations.

** Significant differences were not computed in those instances where pharmacists' behaviours were so similar as to produce no variance.

* Significant difference.

in-store-assessments are "data gathering", "inappropriate recommendations", "appropriate recommendations", and "drug-use-counselling" which, when added together give an "overall performance score". Only the "drug-use-counselling" scores for the experimental group in the "cold" problems as pre-tests was significantly different at the 0.05 level of significance. For the control group, there were no significant differences in the components of either the pre- or post-tests across problems. These findings would suggest that the two "cold" ISAPs are equivalent in relation to their assessment of the level of a pharmacist's performance.

Likewise, the components for "pain" problems were compared (Table XXII). There were no significant differences, at the 0.05 level, in the components when used either as pre-test or post-test. This was the case for both experimental and control groups and supported the parallel nature of the "pain" ISAPs.

For the purpose of assessing the impact of the course on the performance of a pharmacist, the evidence cited above suggests that it was legitimate to collapse the subjects into two groups - those who received "cold" problems and those who received "pain" problems. There were 22 experimental subjects and 24 control subjects who received "cold" problems as their pre- and post-tests. There were 12 experimental subjects and 15 control subjects who received "pain" problems as their pre- and post-tests.

Furthermore, all 34 experimental subjects were treated as one group and all 39 control subjects as another. The rationale for this grouping was as follows. The number of individuals in each group who

TABLE XXII

COMPARISON OF THE COMPONENT SCORES FOR THE TWO PAIN IN-STORE-ASSESSMENT PROBLEMS
FOR THE EXPERIMENTAL AND CONTROL GROUPS

EXPERIMENTAL GROUP PRE-IN-STORE-ASSESSMENT

COMPONENTS	MEAN PERFORMANCE SCORES		t-VALUE	D.F.	t-PROB ¹	F-PROB ²
	PAIN APPROPRIATE	PAIN INAPPROPRIATE				
1. DATA GATHERING	0.99	1.00	0.00	10	0.95	0.24
2. INAPPROPRIATE RECOMMENDATIONS	-0.75	-1.50	-1.82	10	0.10	0.09
3. APPROPRIATE RECOMMENDATIONS	0.25	0.25	0.00	10	0.95	0.79
4. DRUG-USE-COUNSELLING	0.99	0.25	1.81	10	0.26	0.19
5. TOTAL SCORE	1.50	0.00	0.74	10	0.48	0.47

CONTROL GROUP PRE-IN-STORE-ASSESSMENT

COMPONENTS						
1. DATA GATHERING	0.00	0.20	**			
2. INAPPROPRIATE RECOMMENDATIONS	-1.00	-1.00	**			
3. APPROPRIATE RECOMMENDATIONS	0.10	0.00	**			
4. DRUG-USE-COUNSELLING	0.00	0.60	**			
5. TOTAL SCORE	-0.90	-0.20	-1.183	4	0.30	0.001

EXPERIMENTAL GROUP POST-IN-STORE-ASSESSMENT

COMPONENTS	MEAN PERFORMANCES SCORES		t-VALUE	D.F.	t-PROB	F-PROB
	PAIN INAPPROPRIATE	PAIN APPROPRIATE				
1. DATA GATHERING	1.88	1.92	-0.46	10	0.66	0.79
2. INAPPROPRIATE RECOMMENDATIONS	-1.25	-0.75	0.90	10	0.39	0.78
3. APPROPRIATE RECOMMENDATIONS	0.50	0.50	0.00	10	0.95	0.71
4. DRUG-USE-COUNSELLING	0.75	1.75	1.28	10	0.23	0.58
5. TOTAL SCORE	1.87	4.00	-0.83	10	0.43	0.49

CONTROL GROUP POST-IN-STORE-ASSESSMENT

COMPONENTS						
1. DATA GATHERING	0.20	0.00	**			
2. INAPPROPRIATE RECOMMENDATIONS	-1.00	-1.00	**			
3. APPROPRIATE RECOMMENDATIONS	0.10	0.00	**			
4. DRUG-USE-COUNSELLING	0.00	0.20	**			
5. TOTAL SCORE	-0.70	-0.80	0.22	13	0.81	0.16

1. t-Probability. A t-probability of 0.05 or less represents a significant difference.

2. F-Probability. A F-probability of 0.05 or less indicates that the sample variances are significantly different and therefore come from different populations.

** Significant differences were not computed for those instances where pharmacists' behaviours were so similar as to produce no variance.

received pain problems and the number who received cold problems remained the same from pre- to post-test. The maximum possible score for both cold problems was 14. The maximum possible score for the pain problems was 13. The overall maximum score, for each group, remains the same from pre-test to post-test.

Table XXIII presents a summary of the performance of the pharmacists on the pre- and post-in-store-assessments. For the experimental group, there were statistically significant gains, at the .05 level or better, for "data gathering" behaviours, "appropriate recommendations" and the total "overall performance." There was, however, no significant decrease in the number of "inappropriate recommendations" nor a significant improvement in the "drug-use-counseling" behaviours of the pharmacists. For the control group there was no significant improvement in any of the components or the total score. Figure 7 presents a visual representation of these results.

These findings indicate that the educational program did have a beneficial effect on the pharmacists who were in attendance. As reflected by the performances on the in-store-assessment problems, there were significant improvements in the quality of the primary care consulting services provided by the experimental group.

The data in Table XXIII indicated that the level of performance by pharmacists in this area is low. Even after the educational program, the mean total performance score was only 4.38 out of a maximum total performance score of 13 and 14. The reason for such poor performance is a question worthy of future investigation.

TABLE XXIII
GAIN FOR THE POST-IN-STORE-ASSESSMENT SCORES
FOR THE EXPERIMENTAL AND CONTROL GROUPS

EXPERIMENTAL

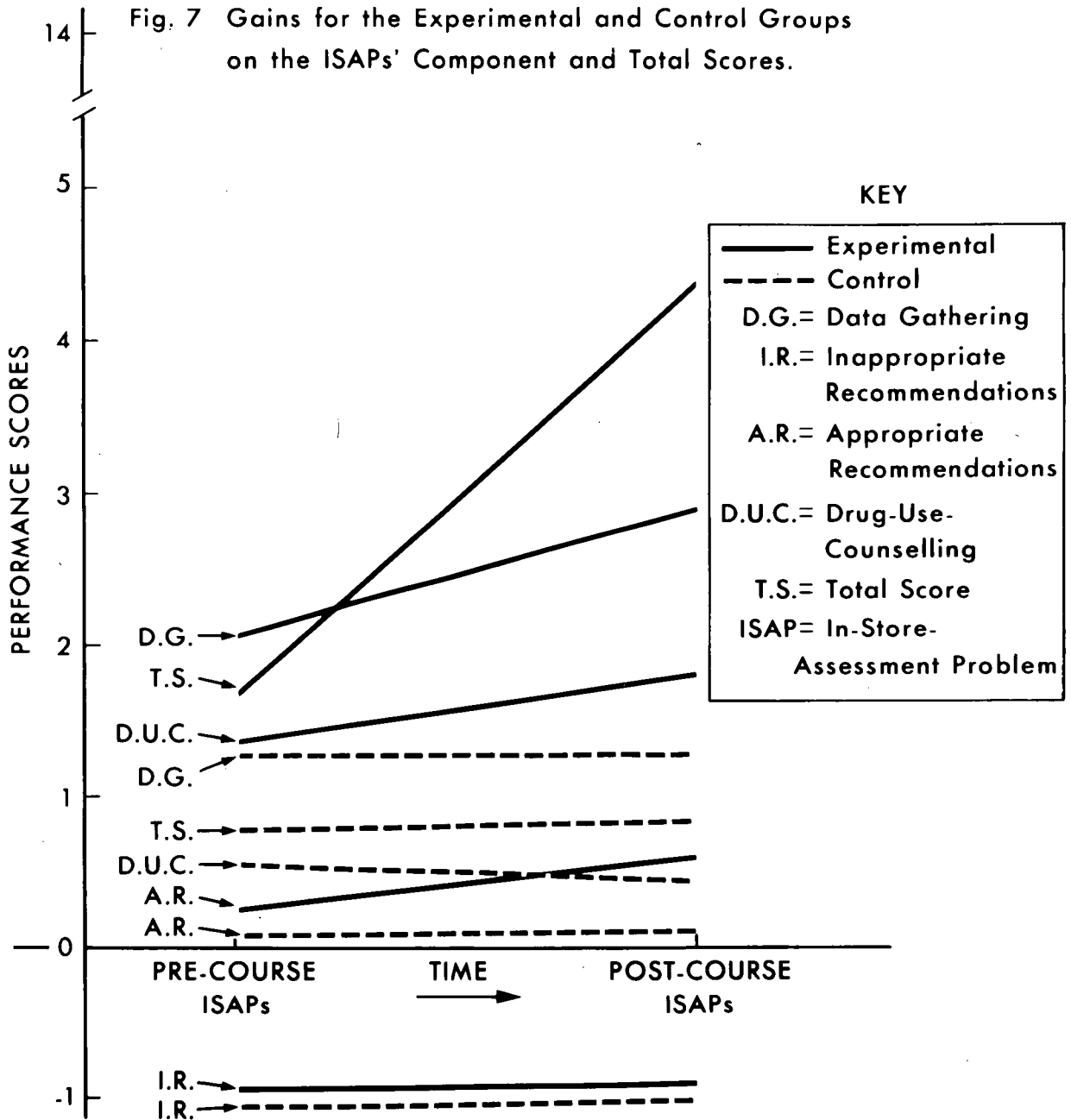
Component	Pre-Test		Post-Test		Dif- ference	t-Value	D.F.	t-Prob ¹
	Mean	S.D.	Mean	S.D.				
Data Gathering	2.06	1.63	2.88	1.96	0.82	2.49	33	0.02*
Inappropriate Recommendations	-0.94	0.55	-0.91	0.67	-0.03	-0.21	33	0.82
Appropriate Recommendations	0.24	0.55	0.59	0.89	0.35	2.10	33	0.04*
Drug-Use-Counselling	1.33	1.24	1.79	1.51	0.46	1.69	33	0.10
Total Score	2.65	2.13	4.38	3.99	1.74	2.44	33	0.01*

CONTROL

Component	Pre-Test		Post-Test		Dif- ference	t-Value	D.F.	t-Prob
	Mean	S.D.	Mean	S.D.				
Data Gathering	1.28	1.05	1.28	1.59	0.00	0.00	38	0.95
Inappropriate Recommendations	-1.08	0.35	-1.03	0.36	-0.05	-0.57	38	0.58
Appropriate Recommendations	0.08	0.35	0.10	0.38	0.03	0.30	38	0.76
Drug-Use-Counselling	0.51	0.82	0.46	0.94	-0.05	-0.36	38	0.72
Total Score	0.77	2.13	0.82	2.28	0.05	0.14	38	0.82

¹ = t. Probability. A t-Probability of 0.05 or less represents a significant gain.

* Significant difference



The one finding that remains unexplained is the lack of a significant decrease in the number of post-course "inappropriate recommendations" and the presence of a significant increase in the number of post-course "appropriate recommendations". However, since these two activities were not mutually exclusive, it was possible for individuals to make both "inappropriate" and "appropriate recommendations". This occurred in those instances where an individual recommended more than one course of action, one of which being "appropriate" and the other "inappropriate". There were four such cases on the post-in-store-assessments of the experimental group. There were no such instances on the pre-in-store-assessments for the experimental nor in either the pre-or post-assessment of the control group. For the experimental group, there were 28 "inappropriate recommendations" on the pre and 25 on the post-in-store-assessments. As well, there were six "appropriate recommendations" on the pre-and 13 on the post-in-store-assessments.

The significant increase in the post-course "appropriate recommendations" could be attributed to changes in two areas. A decrease in the number of "inappropriate recommendations", which by itself was insignificant, and a change within the "appropriate recommendation" sections. It was possible for individuals to improve their scores by giving the "acceptable" alternative on the pre-test and "the most appropriate" recommendation on the post-test. Therefore it would appear that most of the increase in this component came from an improvement of the performance within the category. Those who were

already giving "good" advice gave "better" advice.

From the data already presented in Table XXIII, it is obvious that the one aspect which improved the most as the result of the continuing education program was the "data gathering" behaviours. Pharmacists asked more questions about observers' primary care requests after the educational program than they did before.

To examine the in-store-assessment findings in detail, Tables XXIV to XXVII, in Appendix A, present the relationships between the performance on the in-store-assessments and the various situational factors recorded by the observers during their visits to the pharmacies. Table XXIV contains the data for the pre-assessment and Table XXV contains the data for the post-assessment for the experimental group. Tables XXVI and XXVII contain the data for the pre- and post-assessments, respectively, for the control group.

The pharmacist's performance as a primary care consultant was evaluated by calculating a total performance score over the following four subsets of behaviours: "data gathering", "inappropriate recommendations", "appropriate recommendations", and "drug-use-counselling". "Data gathering", "appropriate recommendations" and "drug-use-counselling" contribute positively and "inappropriate recommendations" contributes negatively to the total performance score.

If these behaviours are related and are representative of the steps involved when a pharmacist responds to a primary care request, then they should correlate significantly with one another. "Data gathering", "appropriate recommendations" and "drug-use-counselling" should correlate

positively with one another and the total score. "Inappropriate recommendations" should correlate negatively with the other subsets and with the total score. However, correlation coefficients between the components and the total performance score are inflated since scores of the various subsets are summed to give the total performance score (see Table XXVIII).

TABLE XXVIII
CORRELATIONS AMONG COMPONENTS AND WITH TOTAL SCORES OF THE IN-STORE-ASSESSMENTS FOR THE
EXPERIMENTAL AND CONTROL GROUPS

		DATA GATHERING	INAPPROPRIATE RECOMMENDATIONS	APPROPRIATE RECOMMENDATIONS	DRUG-USE- COUNSELLING	TOTAL SCORE
DATA	EXPERIMENTAL PRE-ASSESSMENT		<u>-0.57¹</u>	<u>0.45</u>	<u>0.51</u>	<u>0.89</u>
GATHERING	EXPERIMENTAL POST-ASSESSMENT		<u>-0.47</u>	<u>0.37</u>	<u>0.49</u>	<u>0.86</u>
	CONTROL PRE-ASSESSMENT		-0.20	0.01	<u>0.69</u>	<u>0.93</u>
	CONTROL POST-ASSESSMENT		-0.06	<u>0.49</u>	0.30	<u>0.88</u>
INAPPROPRIATE	EXPERIMENTAL PRE-ASSESSMENT			<u>-0.75</u>	-0.32	<u>-0.70</u>
RECOMMENDATIONS	EXPERIMENTAL POST-ASSESSMENT			<u>-0.68</u>	-0.26	<u>-0.70</u>
	CONTROL PRE-ASSESSMENT			<u>-0.47</u>	0.22	-0.01
	CONTROL POST-ASSESSMENT			<u>-0.43</u>	0.21	-0.30
APPROPRIATE	EXPERIMENTAL PRE-ASSESSMENT				0.31	<u>0.65</u>
RECOMMENDATIONS	EXPERIMENTAL POST-ASSESSMENT				0.14	<u>0.62</u>
	CONTROL PRE-ASSESSMENT				-0.13	0.20
	CONTROL POST-ASSESSMENT				0.00	<u>0.65</u>
DRUG-USE-	EXPERIMENTAL PRE-ASSESSMENT					<u>0.77</u>
COUNSELLING	EXPERIMENTAL POST-ASSESSMENT					<u>0.73</u>
	CONTROL PRE-ASSESSMENT					<u>0.80</u>
	CONTROL POST-ASSESSMENT					<u>0.54</u>
TOTAL	EXPERIMENTAL PRE-ASSESSMENT					
SCORE	EXPERIMENTAL POST-ASSESSMENT					
	CONTROL PRE-ASSESSMENT					
	CONTROL POST-ASSESSMENT					

1. For the experimental group, with 32 degrees of freedom, coefficients of 0.34 and 0.44 respectively are significant at 0.05 and 0.01 levels of significance. In the control group, with 37 degrees of freedom, coefficients of 0.32 and 0.41 respectively are significant at 0.05 and 0.01 levels of significance.

The "data gathering" subset had significant¹ negative correlation with both the pre-(-0.57) and the post-(-0.47) "inappropriate recommendations" subset for the experimental group. Those pharmacists in the experimental group who spent more time asking questions about the problem which precipitated the primary care request made fewer "inappropriate recommendations". There were no significant correlations between these subsets on either the pre-or post-assessment for the pharmacists in the control group.

There were significant positive correlations between the pharmacists' performances on the subsets of "data gathering" and "appropriate recommendations" on the pre-(0.45) and post-(0.37) assessments for the experimental group. There was also a significant positive correlation (0.49) for these two subsets of behaviours on the post-assessment for the pharmacists in the control group. Those pharmacists who gathered the most data about the complaint were more likely to make an "appropriate recommendation".

"Data gathering" performance was significantly correlated with "drug use counselling" behaviours in the pre-(0.51) assessments and post-(0.49) assessments for the pharmacists in the experimental group. A significant correlation (0.69) for performance on these two subsets was also found for the pre-assessments of the control group pharmacists. These findings were interpreted to mean those pharmacists who spend more

¹For the experimental group, with 32 degrees of freedom, coefficients of 0.34 and 0.44 respectively are significant at 0.05 and 0.01 levels of significance. For the control group, with 37 degrees of freedom, coefficients of 0.32 and 0.41 respectively are significant at 0.05 and 0.01 levels of significance.

time questioning the observers about the problem were also the ones who spend more time instructing about the use of a product they recommend.

Since a pharmacist's recommendations were "appropriate" or "inappropriate", the pharmacist's performances in these two subsets should be negatively correlated. The findings support this statement. These two subsets had correlation coefficients of -0.75 on the pre-assessments and -0.68 on the post-assessments for the experimental group. The corresponding coefficients for the pharmacists in the control group were -0.42 and -0.43.

There were no significant correlation coefficients between the performance scores on the subsets "inappropriate recommendations" and "drug-use-counselling". One might expect a significant negative correlation between the two. However, it is possible to recommend an inappropriate product for a complaint and still give good instructions on how to use the product.

There were no significant correlation coefficients between performance on the subset "appropriate recommendations" and performance on the subset "drug-use-counselling" for either group on either assessment. This finding may be explained by the fact that some of the "appropriate recommendations" to the primary care requests used in this study did not involve recommending a drug product. Therefore, the pharmacist would not acquire points for informing the observers, when and how to use the product. Also, some pharmacists may have felt that it was unnecessary to spend time counselling the consumer on how to use the non-prescription product since all products are accompanied by

written instructions.

Setting and Situational Factors

The observers were required to record several situational factors when they were conducting the in-store-assessments. The relationships among these factors and the behavioural components are contained in Table XXIV to XXVII in Appendix A. Table XXIX presents the correlations between the situational factors and the total performance score.

TABLE XXIX

CORRELATIONS AMONG THE SITUATIONAL FACTORS PRESENT DURING THE IN-STORE-ASSESSMENTS AND
THE TOTAL PERFORMANCE SCORES

SITUATIONAL FACTORS	CORRELATIONS WITH TOTAL PERFORMANCE SCORES			
	EXPERIMENTAL PRE-ASSESSMENT	EXPERIMENTAL POST-ASSESSMENT	CONTROL PRE-ASSESSMENT	CONTROL POST-ASSESSMENT
AGE	-0.19	0.26	0.10	-0.01
TIME TO BE GREETED BY PHARMACIST	0.06	-0.49 ¹	0.21	-0.09
TIME SPENT WITH THE PHARMACIST	<u>0.66</u>	<u>0.60</u>	0.17	0.13
BUSY	<u>-0.38</u>	0.02	-0.04	-0.19
NUMBER OF PHARMACISTS WORKING	-0.03	-0.11	-0.21	-0.13
NUMBER OF CUSTOMERS AT THE PRESCRIPTION COUNTER	0.14	-0.14	-0.13	-0.15
NUMBER OF CUSTOMERS IN WHOLE STORE	0.10	-0.23	0.05	-0.11
NUMBER OF CUSTOMERS AT CASH REGISTER ONE	0.08	-0.31	0.11	0.01
NUMBER OF CUSTOMERS AT CASH REGISTER TWO	0.00	-0.04	0.31	0.26
NUMBER OF CLERKS	0.11	-0.24	0.06	-0.18
PHARMACIST'S TREATMENT OF OBSERVER**	<u>-0.80</u>	<u>-0.51</u>	<u>-0.40</u>	<u>-0.43</u>
PHARMACIST'S TREATMENT OF THE OBSERVER'S REQUEST**	<u>-0.67</u>	<u>-0.39</u>	-0.05	-0.30

** Low scores would indicate that the observer felt that the pharmacist was interested in him as a person and his problem.

1. For the experimental group, with 29 degrees of freedom, coefficients of 0.36 and 0.46 respectively are significant at 0.05 and 0.01 levels of significance. For the control group, with 25 degrees of freedom, coefficients of 0.38 and 0.49 respectively are significant at 0.05 and 0.01 levels of significance.

The only instance when the age of the pharmacists had a significant correlation coefficient was in the comparisons for the post-assessments for the experimental groups. There were significant coefficients between age and "appropriate recommendations" (0.41) and between age and "drug-use-counselling" (0.86). Older pharmacists, in the experimental group, therefore, gave more "appropriate recommendations" and more advice on the use of the drug product after the educational program than did the younger pharmacists.

The time which elapsed between when the observer entered the store and when the request was actually presented to the pharmacist would be one indication of how busy that particular store was on that occasion. In the post-course assessments for the experimental group, there were significant correlation coefficients between time elapsed and the scores for "inappropriate recommendations" (0.53), "drug-use-counselling" (0.49) and the total performance score (-0.49). The longer the observer had to wait, in this instance, the more likely the pharmacist would give an "inappropriate recommendation" and the less likely the pharmacist would counsel about the use of the non-prescription product.

For both pre-and post-assessments for the experimental group, the length of time the observers spent with the pharmacists was an influence on the quality of advice given by the pharmacist. The amount of time spent with the pharmacist discussing the request was significantly correlated, in both these assessments, with the amount of "data gathered", whether the recommendations were appropriate or inappropriate,

the amount of information given about the use of the non-prescription product and the overall performance score. While time was an important factor in the performance of the pharmacists in the experimental group it was not an important factor in the performance of the pharmacists in the control group. However, the overall performance of the control group was inferior to that of the experimental group.

The observers were asked to record whether or not the pharmacist "appeared" busy in the dispensary as they were to present their request. In only one instance, the pre-assessments of the pharmacists in the experimental group, did the appearance of being busy significantly correlate (-0.38) with the overall performance scores of the pharmacists. In the other assessment situations, this was not a significant factor in the performance of the pharmacists.

For neither experimental nor control group on the pre- or post-assessments did the quality of pharmaceutical services significantly correlate with any of the following: number of customers at the prescription counter, number of customers in the whole store, number of pharmacists in the dispensary or clerks on duty. All of these would be indicators of how busy the pharmacy was at the time the assessment was conducted.

The observers were required to complete two semantic differential scales as part of the situational factors recorded (see Appendix A). One contained five variables, dealing with the pharmacist's treatment of the observer. The second contained six variables dealing with the pharmacist's treatment of the non-prescription medication request. A low score would indicate that, for the first scale, the observer felt the

pharmacist was concerned about the person, and for the second scale, the observer felt the pharmacist was confident in handling the request. Scores for each scale were correlated with the other situation factors and performance scores.

The treatment of the observer by the pharmacist, as recorded by the semantic differential scale, was significantly correlated to the overall performance of both groups on each assessment. With one exception, the pre-assessment for the pharmacists in the experimental group, it was not significantly correlated with the number of "appropriate recommendations".

The observers' ratings of the pharmacists' treatment of their non-prescription request was significantly correlated with the overall performance scores for both pre- and post-assessments for the pharmacists in the experimental group. For neither the pre- nor the post-assessments of the pharmacists in the experimental or control group was there a significant correlation between this rating and the number of "appropriate recommendations".

These findings from the observers' ratings of the pharmacists in this study, indicate that although the pharmacist may show concern for a problem and be confident about the solution suggested, the recommendations may not always be appropriate.

Predictive Validity of the Written Simulation

The four written simulations developed for this investigation were used on two occasions. They were completed by a group of pharmacists before receiving instruction on "cold" or "pain" in the continuing

education program and they were also completed by a second group of pharmacists after the educational program. In both instances the written simulation matched the ISAP used to assess the pharmacist. The predictive powers of the simulations were then studied by correlating the individual's performance score on the simulated problem with his or her real-life behaviour in response to the same primary care requests. This results in eight distinct correlation coefficients (Table XXX). All the eight correlation coefficients were positive. However, of the eight correlations, only two are significant at the 0.05 level of significance. Written simulation "Cold Appropriate" compared with that ISAP, as post-tests, and written simulation "Pain Appropriate" compared with that ISAP, as post-tests, were significantly correlated. The correlation coefficients were 0.54, with 12 degrees of freedom, and 0.98 with three degrees of freedom. It would appear that these two simulations do predict an individual's real-life performance. However, the evidence is weak.

TABLE XXX
VALIDITY COEFFICIENTS FOR THE FOUR WRITTEN SIMULATIONS
JUDGED AGAINST THE FOUR IN-STORE-ASSESSMENTS

<u>WRITTEN SIMULATION</u>	<u>PRE-COURSE VALIDATION</u>			<u>POST-COURSE VALIDATION</u>			<u>COMBINED VALIDATION</u>		
	r. ¹	d.f. ²	Critical Value	r.	d.f.	Critical Value	r.	d.f.	Critical Value
COLD APPROPRIATE	0.62	6	0.71	0.54*	12	0.53	0.56*	17	0.46
COLD INAPPROPRIATE	0.44	12	0.53	0.01	6	0.71	0.37	17	0.46
PAIN APPROPRIATE	0.48	6	0.71	0.98*	3	0.88	0.68*	10	0.58
PAIN INAPPROPRIATE	0.39	3	0.88	0.36	6	0.71	0.26	10	0.58

1. Correlation coefficient.

2. Degrees of freedom.

* Correlation is greater than the critical value.

The previous correlations were separated into those related to pre-course and post-course validation resulting in eight distinct groups. If a simulation has predictive powers, then it should predict an individual's real-life performance regardless of when it is used. It is, therefore, legitimate to combine the pre- and post-course groups for each simulation. This results in four distinct categories (Table XXX). In so doing, performance on simulation "Cold Appropriate" compared with the individual's real-life performance was 0.56, which was significant. For the simulation "Cold Inappropriate" the correlation coefficient was 0.37 which was not significant. Likewise for simulations "Pain Appropriate" and "Pain Inappropriate", the coefficients were 0.68 and 0.26 respectively. The coefficient of simulation "Pain Appropriate" was significant and the coefficient for simulation "Pain Inappropriate" was not significant.

Here again the evidence, although not overwhelming, was somewhat encouraging. Written simulation "Cold Appropriate" retained its significant predictive powers. The predictive powers of simulation "Cold Inappropriate" improved overall. Combining the pre- and post-course simulations of "Pain Appropriate" resulted in a lower but still significant coefficient, this finding is probably more realistic since the sample size increased. With the combined validation procedure, the predictive powers of written simulation "Pain Inappropriate" were not significant.

Although the evidence is only mildly supportive, it would appear that some of the written simulations developed for this study do predict real-life performance. Perhaps the single largest factor hampering a

more conclusive statement as a result of this study was the small sample size. Future study of the predictive powers of the written simulations will demand larger sample sizes.

The correlation coefficients discussed so far represented the agreement between a pharmacist's score on the written simulation to his or her score on the in-store-assessment. These coefficients considered total scores only and not individual items. In addition to these correlation coefficients a consistency score was calculated comparing individual items which were common to both the ISAPs and the written simulations. There were 17 common behaviours between the written simulation and the ISAP "Cold Appropriate". Likewise there were 17, 15 and 18 common behaviours between the three remaining ISAPs and simulations selected because they were identical on both instruments. For those "identical items", which behaviours did a pharmacist do or not do on the written simulations, how many did he or she do or not do during the in-store-assessment? The agreement on items between ISAP and simulation was expressed as a percentage. The mean agreement on the pre-assessment was 66.54 percent. The mean agreement for the post-assessment was 65.71 percent. If the written simulations and the in-store-assessments contained all the plausible pharmacist behaviours in response to a primary care request, these consistency scores present further evidence of the predictive powers of written simulations.

Pharmacists performed better on the simulations than they did on the ISAPs, both in overall performance scores and relative to the

"optimal level of performance." On the simulations they asked more questions about the symptoms and were more likely to ask about drug use. It would appear that presenting a list of alternatives has a cueing effect (1).

In addition, performance on those simulations involving a "minor" complaint was a better indicator of real-life behaviour. For the problems cold and pain inappropriate the panel of experts strongly felt that physician consultation was warranted. More pharmacists included this in their recommendations on the simulations than on the in-store-assessments. Again, this may be due to the cueing effect.

Factual Knowledge Tests

One of the traditional ways of evaluating the success of a pharmacy continuing education program has been to test for factual knowledge recall. In the continuing education program being evaluated in this study, factual knowledge tests were administered every evening. The mean and standard deviations for the tests concerning "cold" and "pain" subject matter are presented in Table XXXI.

TABLE XXXI

GAINS IN FACTUAL KNOWLEDGE AS REPRESENTED BY SCORES ON PRE- AND POST-TESTS¹ AND THE RELATIONSHIPS BETWEEN THESE SCORES AND REAL-LIFE PERFORMANCE

TEST CONTENT	MPS ²	PRE-TEST		POST-TEST		t-VALUE	D.F.	t-PROB ⁴
		MEAN	r ³	MEAN	r			
COLD	15	8.44	-0.14	12.00	-0.29	5.09	16	0.001*
PAIN	9	4.64	-0.26	8.27	0.34	10.77	10	0.001*

1 = Multiple-choice and True-false Questions

2 = Maximum possible score

3 = Correlation coefficient between knowledge test score and performance on the ISAPs

4 = A t-probability of less than 0.05 represents a significant gain

In the context of gains in factual knowledge recall, the continuing education program was a success, since there were significant gains on both pain and cold post-tests. In addition, it has been previously shown that there were significant gains in the post program assessments of real-life performance. On two evaluation instruments, then, the course participants had statistically significant improved performance, therefore the educational program had an impact. There was, however, no statistically significant correlation (0.14) between the two gain scores.

From the data in Table XXXI, it is obvious that there is no strong relationship between the performance on a test for recall of information and real-life performance. Factual knowledge tests in this study were not accurate predictors of real-life performance.

The factual knowledge tests developed for this investigation, purport to measure recall of specific information. And the written

simulations purport to measure the application and integration of this information to the solution of a problem. Knowledge is a necessary prerequisite for problem solving. However, knowledge scores and problem solving scores are found to be unrelated (Table XXXII). Therefore, either the knowledge is not that required to solve the problems in question, or knowledge alone is not sufficient - problem solving is a cognitive skill and as a skill, it is developed through practice and feedback on level of performance.

TABLE XXXII

RELATIONSHIP BETWEEN SCORES ON TESTS FOR FACTUAL KNOWLEDGE
RECALL AND PERFORMANCE ON WRITTEN SIMULATIONS

Simulation One (Cold Appropriate) Performance					
Factual Knowledge "Cold"	Pre-Test	r^1	= -0.11	d.f. ²	6
	Post-Test ³	r	= 0.18	d.f.	12
Simulation Two (Cold Inappropriate) Performance					
Factual Knowledge "Cold"	Pre-Test	r	= -0.02	d.f.	12
	Post-Test	r	= -0.28	d.f.	6
Simulation Three (Pain Appropriate) Performance					
Factual Knowledge "Pain"	Pre-Test	r	= -0.59	d.f.	6
	Post-Test ⁴	r	= 0.25	d.f.	3
Simulation Four (Pain Inappropriate) Performance					
Factual Knowledge "Pain"	Pre-Test	r	= -0.60	d.f.	3
	Post-Test	r	= 0.26	d.f.	6

- 1 = Correlation coefficient between pre- or post-test score and performance on pre- or post-written simulation.
2 = Degrees of freedom.
3 = Individuals who received written simulation one as pre-test received written simulation two as post-test and vice versa.
4 = Individuals who received written simulation three as pre-test received written simulation four as post-test and vice versa.

Participants' Evaluation of the Program

One of the objectives of this investigation was to obtain the participants' subjective evaluation of the course. Was there a relationship between "liking" the course and performance on the tests for factual knowledge and real-life performance?

To obtain their reaction to the course, participants were asked to complete an evaluation form on the last evening of the

program. They were asked to use a magnitude estimation scale to rate various components of the program. A line of a standardized length represented the average continuing education program, and they were then asked to draw a line rating the present course on a number of dimensions. Their lines were later measured and expressed as a ratio of the standard line. Table XXXIII presents arithmetic mean, geometric mean (2) and the median values for the participants' ratings. A ratio of one would indicate that they felt this course was equivalent to the average continuing education course. A ratio of less than one would mean they rated this course inferior to the average continuing education course on that dimension. A ratio greater than one would indicate that they rated this course superior on that dimension. From the data contained in Table XXXIII, it is obvious that the experimental subjects rated this program equal to or superior to the average course attended in the past on all dimensions. Those areas for possible improvement are: 1. more emphasis on the signs and symptoms of the condition being discussed, 2. the length of the lectures could be changed, 3. selection of speakers who are more knowledgeable and have a better style of presentation and 4. provide more opportunities for discussion. With respect to number two and three, some participants felt that the lectures tended to be "a bit" too long and that the younger speakers lacked the practical pharmacy experience and this affected their credibility.

TABLE XXXIII

MAGNITUDE ESTIMATIONS BY EXPERIMENTAL SUBJECTS COMPARING
DIMENSIONS OF THIS PROGRAM WITH THE AVERAGE CONTINUING
EDUCATION PROGRAM IN THE PAST

<u>Dimension</u>	Geometric	Arithmetic	<u>Median</u>
	<u>Mean¹</u>	<u>Mean</u>	
1. Usefulness of material learned.	1.66	1.78	1.84
2. Use of material for advising patients.	1.63	1.80	1.86
3. Material too elementary.	0.70 ²	0.79	0.93
4. Emphasis on drug products.	1.40	1.54	1.57
5. Emphasis on signs and symptoms of relevant diseases.	1.24	1.36	1.02
6. Length of lectures.	1.24	1.32	1.03
7. Speakers were knowledgeable and presented material well.	1.16	1.31	1.00
8. Usefulness of handouts.	1.45	1.60	1.50
9. Opportunity for discussion.	1.35	1.45	1.14
10. Usefulness of pre-/post-tests.	1.55	1.75	1.81
11. Efficient learning experiences.	1.70	1.82	1.59
12. Preferable learning experience.	1.48	1.69	1.52

1. A mean of 1.0 would indicate the experimental subjects felt this program equalled the average continuing education program on that dimension.
2. This item was the reverse of all other items. A line larger than the standard line would indicate the material was not too elementary. Although it was explained, it may have been misunderstood by some of the participants.

The pharmacists' ratings of the dimensions were correlated with one another. As well, the year the pharmacist graduated from

university and the number of continuing education programs attended the previous three years were included in this correlation matrix. Significant correlation coefficients, at the 0.05 level of significance revealed the following information. (See Table XXXIV, Appendix E)

The older pharmacists found the material more useful in advising patients and were more likely to agree that the handouts were useful. Many of the older pharmacists would have an established approach to advising patients. However, previous findings reported in this study suggested that it was this group of pharmacists who changed the most from the pre to post course in-store-assessments. The only time that age was significantly correlated with performance on the in-store-assessments was during the post program assessments. The older pharmacists had higher overall performance scores and had more appropriate recommendations.

Those individuals who rated the material useful also rated a number of other dimensions of the program highly. The exceptions were that they did not think the material was too elementary, they did not feel there was enough opportunity for discussion, they did not like the length of the lectures and they were less likely to rate the pre-/post-tests as useful.

Those individuals who felt the information was useful in advising patients agreed there was the proper emphasis on the products, there was the proper emphasis on the disease conditions being discussed, the speakers were knowledgeable and presented the material well

and the handouts were useful. Also they felt it was an efficient and preferable learning experience.

Pharmacists who felt this program placed the proper amount of emphasis on the drug products also agreed on a number of other items. They felt there had been the proper emphasis on the signs and symptoms of the conditions being discussed, the handouts and pre-and post-tests were useful and they rated the program as an efficient and preferable learning activity.

Individuals who liked the emphasis on the signs and symptoms of the disease also thought the handouts were useful and that the speakers were knowledgeable. In addition, they felt the program was a more efficient and preferable learning experience.

There were significant correlation coefficients between the ratings of individuals who felt the lectures were the proper length and the usefulness of the handouts and the knowledge level of the speakers.

Pharmacists who rated the speakers highly also rated the handouts useful. They also felt the program was an efficient and preferable learning experience. Individuals who found the handouts useful felt the program was both an efficient and preferable learning experience. Pharmacists who felt this program was more efficient than the average past program also felt it was a preferable program.

There were few significant correlation coefficients between the items "length of lectures" and "opportunity for discussion." This indicates considerable disagreement on the magnitude of the value

assigned to these two items and suggests in future for this program these characteristics should be altered.

The evaluation form also asked the pharmacists to use the magnitude estimation technique to compare the learning attributable to various program activities with the average learning in a thirty minute lecture. The arithmetic mean, geometric mean and median values for these comparisons are contained in Table XXXV. The pharmacists attributed less learning to the simulations, videotapes, and buzz groups. These were innovations and some of these results may be explained by the pharmacists feeling uncomfortable with these new instructional techniques and devices. They attributed an equal amount or more learning to the lecture, pre-and post-tests, large group discussions and question periods. (All modes of learning to which they were accustomed.)

TABLE XXXV

MAGNITUDE ESTIMATIONS BY EXPERIMENTAL SUBJECTS COMPARING
THE AMOUNT OF LEARNING ATTRIBUTABLE TO PROGRAM ACTIVITIES
WITH THAT ATTRIBUTABLE TO STANDARD 30 MINUTE LECTURE

<u>Activity</u>	<u>Geometric Mean</u>	<u>Arithmetic Mean</u>	<u>Median</u>
Simulations	0.72	0.87	0.91
Videotapes	0.60	0.77	0.62
Pre-/Post-Tests	1.10	1.24	1.05
Lectures	1.30	1.45	1.12
Buzz Groups	0.71	0.84	0.74
Large Group Discussions	1.00	1.13	1.00
Question and Answer Periods	1.04	1.13	1.10

There were significant correlations, at the 0.05 level of significance, in the following areas: positive relations between the ratings of learning via simulations and the video tapes.

Those individuals who attributed more learning to the pre- and post-tests also felt more learning occurred during the lectures, the large group discussions and the question and answer periods. Participants who attributed a large amount of learning to the group discussions also felt the question and answer periods made significant contributions to their learning.

Pharmacists who felt the material was useful, had the proper emphasis on signs and symptoms of relevant diseases, had actually used the material in advising patients and felt the speakers knowledgeable tended to attribute more learning to the lectures. Those participants who felt there was the proper emphasis on the drug products also attributed significant amounts of learning to the pre and post tests. Those who rated the speakers highly felt they had learned more from the lectures. Individuals who were satisfied with the pre- and post-tests also felt they learned from them. Pharmacists who rated this program a more efficient learning experience attributed more learning to the lectures. Participants rating this program as preferable attributed larger amounts of learning to the simulations, the video tapes, the pre and post tests and the lectures.

The only significant correlation coefficients between the number of programs attended in the three previous years and any of the dimensions in Table XXXIII or activities in Table XXXV were with the length of the lectures and the amount of learning attributable to

buzz groups. Those individuals who had attended more programs were dissatisfied with the length of the lectures and attributed less learning to the buzz group activity.

From the subjective evaluations of the 23 pharmacists in the experimental group who completed the form, the program was a success. They rated it equal to or superior to the average continuing education program attended in the past on all the twelve dimensions on the evaluation form. The majority felt it had been an efficient and a preferable learning experience in comparison with the average continuing education program in the past.

The program was a success in the eyes of the participants. This was supported with the objective evidence of gains in factual knowledge and improved real-life performance.

There were, however, no statistically significant relationships between the participants' efficiency or preference ratings of the program and gains in the total performance score or gains in the factual knowledge recall.

References

Chapter Five

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CHAPTER SIX

SUMMARY AND CONCLUSIONS

The following is a summary of the activities conducted during and the conclusions formulated as a result of this investigation.

Summary

This study evaluated a continuing education program designed to improve a group of community pharmacists' performance as primary care consultants. A second, and equally important, purpose of this investigation was the development of pharmacy written simulations of primary care requests and the exploration of their powers to predict an individual's performance in the real world.

The educational program was evaluated using three modes of measurements: unobtrusive observation of change in the real-life performance of the pharmacists as primary care consultants, gain in factual knowledge as the result of instruction during the program, and participants' subjective reaction to the program contents and processes. To conduct these measurements, several evaluation instruments were developed. First, a panel of content experts assisted in the construction of four "in-store-assessment problems". The purpose of these problems was to evaluate pharmacists, in their place of employment, as primary care consultants on "cold" and "pain" requests. The accompanying performance checklist permitted an evaluation of the pharmacist in the following areas: "data gathering", "appropriateness" of recommended actions and "drug-use-counselling". Second, knowledge tests were

developed in the areas of "cold" and "pain" non-prescription medication requests. These were administered before and after instruction had occurred on the above therapeutic categories. Third, an instrument was developed which used a magnitude estimation format and asked the participants to compare the present course to the "average" course they had attended in the past.

Before and after the educational program, trained observers were used to administer the ISAPs to determine if the primary care consulting skills of the registrants had improved. A "non-equivalent" control group was also assessed at these times. This group controlled for other educational activities which may have influenced the primary care consulting behaviour of all the pharmacists in the province. The knowledge tests measured increased information recall as a result of instruction. The relationship between scores on these tests and performance in the real world was studied. In order to obtain the pharmacists' reaction to the "value" or "worth" of the program, a magnitude estimation evaluation form was used on the last evening.

The panel of content experts also assisted in the development of four written simulations. The content of the simulations paralleled the four ISAPs. The simulations were completed by the pharmacists enrolled in the program before and after receiving instruction on "cold" and "pain" primary care requests. These were assigned in each instance, so that the content of the simulation matched the content of the pharmacist's pre-and post-"in-store-assessments". The performance of the of the pharmacists on the written simulations was studied to determine if

it predicted an individual's real-life performance.

Conclusions

The conclusions formulated as a result of this investigation are discussed in terms of the eight original objectives outlined in Chapter One.

Objective 1: To develop four realistic primary care requests, in the area of non-prescription medications, to be used as in-store-assessment problems (ISAPs).

A panel of content experts agreed that the four requests were realistic and plausible and did in fact represent situations which occur daily in community pharmacies. It was concluded from this evidence, that the primary care requests used as the ISAPs were valid.

Objective 2: To devise and validate a comprehensive list of observable pharmacist behaviours, in response to the primary care requests, which will enable an evaluation of pharmacists' primary care consulting skills.

The panel of content experts agreed that the lists of possible pharmacist behaviours accompanying the requests were comprehensive in nature. In addition, there were high inter-rater correlation coefficients for the panelists' ratings of the appropriateness of the behaviours in all four problems. It was concluded that the lists of pharmacist behaviours could be used to assess an individual's response to the primary care requests and that the level of agreement on the weightings of the items allowed for separating the behaviours in each list into "appropriate" and "inappropriate" responses to the requests.

Objective 3: To assess the improvement in the quality of primary care consulting of those pharmacists who participated in the continuing

education program.

There were significant gains in the overall performance of the course participants as measured by the ISAPs. This improvement in performance was attributable to significant increases in "data gathering" and the number of "appropriate recommendations". There were no significant changes in the number of "inappropriate recommendations" or in the "drug-use-counselling" behaviour. There were no significant improvements in any of these areas for the "non-equivalent control" group. It was concluded that the noted improvements in the course participants' performance were the result of participation in the program.

Objective 4: To measure the gains in factual knowledge as a result of participation in the program.

There were significant gains in the post-test scores of the course participants. It was concluded that the program improved the participants' factual knowledge recall on "cold" and "pain" non-prescription medications.

Objective 5: To determine the relationship between scores on a test for factual knowledge and real-life performance.

There was no statistically significant relationship between scores on a test for factual knowledge and performance on the "in-store-assessments". In this program, the participants who recorded the highest marks on the knowledge test were not necessarily the individuals who performed the best on the job.

Objective 6: To obtain the participants subjective evaluation of the program.

On twelve dimensions, the participants rated this program equal to or superior to the "average" continuing education program they had attended in the past. It was concluded that the program was a success in terms of participant satisfaction.

Objective 7: To develop and validate four written simulations which were suitable for evaluating a pharmacist's performance in the area of primary care consulting.

A panel of content experts agreed that the four simulations were realistic and the primary care problems they contained were plausible. As well, there were significant inter-rater correlation coefficients for the weights to be assigned to each item within the simulations. In addition, the performance scores of criterion groups, possessing varying amounts of expertise in the simulations subject matter, increased with the amount of experience. On the basis of these data it was concluded that there was substantial evidence supporting the validity of the four written simulations developed to assess primary care consulting behaviour.

Objective 8: To assess the predictive powers of the written simulations by comparing the pharmacist's real-life performance with that of his performance on the simulations.

All four written simulations had positive correlation coefficients with the pharmacists' real-life performance. Two of the four had statistically significant but weak correlation coefficients with individuals' real-life performance. As well, there were high consistency scores representing agreement of individual behaviours

between the two measurement techniques. It was concluded that two of the simulations developed for this study did predict real-life performance and also that all four hold promise of having significant predictive powers.

Two of the most important contributions of this investigation are the approach to the evaluation of the effect of a continuing education program and the development and validation of written simulations for pharmacy practice. Further developmental work is encouraged in each area. The following limitations to this study should be considered when designing future studies.

1. The "cold appropriate" and the "pain appropriate" simulations and ISAPs were developed to have potential disease-drug contraindications. To avoid the possibility of a pharmacist recognizing a connection between the two measurements, the ISAPs and simulations were constructed to have different but equally significant disease-drug contraindications. Although the majority of panelists rated all these disease-drug combinations as situations to be avoided, current literature (1,2) would not support all of them as being clinically significant. Therefore, some pharmacists were penalized for recommending products which were rated as incompatible with an existing disease entity even though the accuracy of the ratings is in dispute. This would be reflected in lower performance scores. In addition, the disease-drug contraindications in some situations may have been more clinically significant and, therefore, the ISAPs and the simulations were not parallel in this regard. Future studies which incorporate disease-drug contraindications should ensure that the contraindications are supported by

clinical data as well as panelists' judgements and are identical in the simulations and ISAPs.

2. The ISAPs were scored by the author and this is recognized as possibly introducing a source of bias into the scores assigned. Future studies should use a "blind" scoring procedure and have each performance checklist scored by several individuals.

3. The observers who collected the in-store-assessment data recorded the results of their interaction with the pharmacist on the performance checklist. In retrospect, it would have been useful to have them also make a second record on an audio cassette tape. This would have enabled a check of the material recorded by the observer. Such a procedure was followed by Jang (3).

4. Experience gained from this investigation would indicate that establishing performance criteria is a difficult task. The author acknowledges that the final criteria used are a reflection of this particular panel. A second panel may have derived a slightly different set of criteria. A more thorough pre-testing of the performance criteria is recommended for future studies, but studies based on multiple criteria probably have the best overall chances for success. Such multiple measures may include "expert" panels, user panels, patient/client panels and findings in research journals.

In summary, the educational program studied did improve the real-life performance of the pharmacists enrolled, did improve their factual knowledge recall and was evaluated very highly by the participants. Two of the simulations developed for this study did predict behaviour on the job. These conclusions relate only to this investigation. The small

sample size and the absence of random assignment of subjects to control and experimental groups prevent generalizing beyond the two groups in this study. Further research should be conducted with larger sample sizes and more rigidly controlled experimental conditions.

On the basis of the findings in this study, there are a number of implications for pharmacy practice, continuing pharmacy education and the application of written simulations in pharmacy.

Many would advocate an expanded role for the pharmacist as a provider of primary care. However, in this study, there was a considerable range in the performance of both experimental groups when responding to the primary care requests. The overall quality of health care in this area, as defined by the panel of content experts, was quite low. In advising consumers, pharmacists asked few questions to determine the nature of the complaint and seldom gave advice on how to use the product recommended. Further research is needed to establish the cause of this deficit in performance. Is it due to a genuine lack of knowledge or attributable to a role conflict?

One question which is often asked by adult educators in the health professions is "Are our continuing education programs really making any differences in the quality of care delivered to the public?" This study supports a weak affirmative response to that very important question. More studies are needed which measure the impact of programs on the actual practice of professionals. In addition, studies are needed to determine the components of continuing education activities which maximize the transfer of learning to the everyday practice of

professionals.

Continuing pharmacy education programs generally use a pre- and post-test of factual knowledge to evaluate the success of instruction. This investigation could not document any statistically significant relationship between factual knowledge scores and performance on the job. Therefore, continuing educators should exploit every opportunity to investigate new evaluative instruments which may be better predictors of real-life performance.

The written simulations developed for this study provided evidence that the technique is applicable to the evaluation of continuing pharmacy education programs and can predict real-life performance. Future work should continue to develop simulations in this and other areas of pharmacy practice and investigate their predictive validity. If a sufficient number of valid written simulations can be constructed, they may be a useful device in the process of competency determination. As well, the effectiveness of written simulations as an instructional aid in pharmacy education warrants study.

References

Chapter Six

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APPENDICES

APPENDIX A: MATERIALS RELATING TO THE DEVELOPMENT AND USE OF THE IN-STORE-ASSESSMENT PROBLEMS (ISAP'S).

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PROBLEM ONE

For the past month, some friends, a married couple have been visiting you. It has been partly pleasure and partly business as the husband has been combining some company business with this vacation. Your friends are staying with you and you have been taking them on short trips to other parts of the province.

The husband, who is in his early 50's, has developed a sore throat within the last twenty-four hours. He says that he had trouble sleeping last night due to his stuffed nose dripping down the back of his throat. His nose is congested and he says that he is having trouble breathing through it. He has a slight cough but there is no congestion in his chest. He does not appear to have a fever. His appetite is good. He is convinced that it is just a cold and feels it does not warrant physician treatment.

Otherwise, he seems to be in good health and good spirits. He is a diabetic and he takes a white pill each morning with breakfast, you do not know which type. He has remarked that his physician only last month said that he was doing fine and was in good health.

You have been in the area and decided that you would stop in at the drugstore to get something for his cold.

SITUATION:

Find the cough and cold section, examine the products for some time, two or three minutes. Wait your chance and present the problem to the pharmacist.

Ask the pharmacist: "What is good for a cold?"

Answer the pharmacist's questions from the background material provided. Carefully observe the pharmacist's responses for recording later. Agree with his suggestions for a non-prescription product and purchase a "reasonable" size package. Thank the pharmacist for his/her assistance and leave.

PROBLEM TWO

Your brother, who is thirty-five, has been visiting you for almost three weeks. This is his first trip to B.C. and you have been taking him on short trips to show him some of the province. He is due to leave in two or three days. He has not "felt well" for four or five days. He has felt worse in the last day or so. You have not taken his temperature but this morning he was hot to touch. He says that he has sore muscles and feels tired. Last evening he had the "chills". His throat is sore and his nose is congested. He feels congested in the chest and has a violent cough and when coughing brings up some congestion. He has little appetite. He would like something to relieve the cough, the plugged nose and the sore muscles. Since he is leaving in a few days, he says that he will see his physician when he returns home if the condition is no better.

He does not take any prescription drugs or non-prescription drugs. To the best of your knowledge he has no allergies.

You are concerned and decide to ask for something to relieve the symptoms the next time you are near a drugstore.

SITUATION:

Enter the store and find the "cough and cold" section. Examine the products for two or three minutes then wait for your chance and present the problem to the pharmacist.

Ask the pharmacist: "What is good for a cold?"

Answer the pharmacist's questions from the background material provided. Carefully observe the pharmacist's behaviour and responses for recording later. Agree with his suggestions for non-prescription products and purchase a "reasonable" size package. Thank the pharmacist for his/her assistance and leave.

PROBLEM THREE

Some good friends, a couple, have been visiting you for about three weeks. They have been staying at your home when they have not been taking short trips around the province. You occasionally have accompanied them on these trips, particularly on week-ends and your days off. They have enjoyed their stay and cannot believe that the time has passed so quickly and they will be leaving in a few days.

The wife, who is in her late forties, says that she has had a headache all day and although she feels it does not warrant a physician's treatment she would like to take something for the pain. You do not have any pain relievers at home. You are in the area of this drugstore so you decide to purchase some pain relievers for her.

To the best of your knowledge your friend is in good health. She does not have a history of migraine headaches. She is a diabetic and has been taking white tablets each morning with her breakfast for several years. She is also on a restricted diet. She has remarked that her doctor said only last month that she was in "good health". To the best of your knowledge she has no allergies and she takes no non-prescription drugs.

SITUATION:

Go to the drugstore and find the section containing the pain relievers (Asprin^R, Anacin^R, et cetera.) Examine the products for a period of time (two or three minutes). Wait for your opportunity to present the problem to the pharmacist.

Ask the pharmacist: "What is the strongest pain reliever I may buy without a prescription?"

Answer the pharmacist's questions from the background information provided. Carefully observe the pharmacist's behaviours and responses for recording later. Agree with his suggestions for a non-prescription product and purchase a "reasonable" size package. Thank the pharmacist for his/her assistance and leave.

PROBLEM FOUR

Your sister and brother-in-law are visiting you for three weeks. Their stay with you is almost over. Your sister has been complaining of pains in her wrists and fingers. She says that it is more annoying than painful and it is like a "tightness" or "stiffness" in hands and wrists. It is worse first thing in the morning. She says that it has been coming and going for "several months". Her husband says that she has been procrastinating about going to a doctor, much to his disapproval. She has been taking two or three aspirin^R tablets a day for the pain but she feels that they are not really much good. In addition to the "stiffness" she has mentioned that she feels as if she is tiring faster than usual. She is thirty-six years old.

You decide that since you are in the drugstore looking for something else that you will inquire about a stronger pain reliever. To the best of your knowledge your sister takes no prescription drugs and no non-prescription medications except aspirin^R. She has no allergies. She last saw a physician about a year ago concerning a cold and this problem was not discussed at that time.

SITUATION:

Go to the store and find the section containing the pain relievers. Examine the products for two or three minutes. Then, when your opportunity to present the problem comes up, speak to the pharmacist on duty.

Ask: "What is the strongest pain reliever I may purchase without a prescription?"

Answer the pharmacist's questions from the background information provided. Carefully observe the pharmacist's responses and behaviours for recording later. Agree with his suggestions and purchase a "reasonable" size package of a non-prescription pain reliever if he recommends one. Thank the pharmacist for his/her assistance and leave.

TABLE II

JUDGES' RATINGS OF THE INDIVIDUAL
BEHAVIOURS SUGGESTED FOR ISAP ONE

In response to the primary care request "What is good for a cold?" should a pharmacist:				
<u>BEHAVIOURS</u>	<u>Mean</u>	<u>S.D.</u>	<u>Range</u>	<u>Q3-Q1</u> <u>2</u>
* 1. Ask who it was for.	4.90	.3162	1.00	.00
* 2. Inquire about the symptoms.	5.00	.0000	.00	.00
* 3. Ask about fever.	4.40	.6992	2.00	.50
* 4. Ask for a description of any cough.	4.40	.6992	2.00	.50
* 5. Ask about the duration of the symptoms.	4.50	.5270	1.00	.50
* 6. Ask about allergies.	4.20	.7888	2.00	.50
* 7. Ask about concurrent use of prescription drugs.	4.70	.4830	1.00	.50
* 8. Ask about concurrent use of non-prescription drugs.	4.50	.7071	2.00	.50
* 9. Direct you to a clerk for assistance.	1.09	.3162	1.00	.00
* 10. Direct you to a pharmacist for assistance.	3.00	.0000	.00	.00
* 11. Without asking about the symptoms direct you to the "cough and cold" section out front.	1.29	.4839	1.00	.50
* 12. Without asking about the symptoms, recommend a product.	1.50	.7071	2.00	.50
* 13. Without asking about the symptoms, direct you to a physician for assistance.	1.90	.3162	1.00	.50
* 14. After inquiring about the symptoms direct you to a physician.	2.50	.5270	1.00	.50

TABLE II. cont.

BEHAVIOURS	Mean	S.D.	Range	$\frac{Q3-Q1}{2}$
*15. Suggest the condition is not serious enough to warrant treatment with a non-prescription product.	2.00	.0000	1.00	.00
*16. Recommend a product containing a sympathomimetic amine.	2.20	.9189	2.00	1.00
**17. After inquiring about the symptoms, recommended a product.	3.90	.5676	2.00	.00
**18. Recommend a topical decongestant or an oral product containing no sympathomimetic amines.	4.09	.5676	2.00	.00
**19. Recommended a sugarless product after inquiring about symptoms.	4.50	.7071	2.00	.50
**20. Suggest seeing a physician if symptoms persist.	4.50	.5270	1.00	.00
*21. Indicate how to use the product.	4.59	.5163	1.00	.50
*22. Indicate when to take the product.	4.59	.5163	1.00	.50
*23. Indicate how long to take product.	4.59	.5163	1.00	.50
*24. Explain why it is appropriate or inappropriate to use a particular product given the symptoms and other factors (prescription drugs taken, etc.).	4.09	.5676	2.00	.00
25. Come out from behind the dispensary counter to discuss your problem or to recommend a product.	3.70	.6324	2.00	.50

*Used as a final criterion in the evaluation of the pharmacists.

**These four behaviours were combined into the following two criteria:

- i. After inquiring about the symptoms, recommended a topical decongestant or an oral sugarless product which does not contain a sympathomimetic amine and suggest consulting a physician if symptoms persist.
- ii. After inquiring about the symptoms, recommend a topical decongestant or an oral sugarless product containing no sympathomimetic amine.

TABLE III

JUDGES' RATINGS OF THE INDIVIDUAL
BEHAVIOURS SUGGESTED FOR ISAP TWO

In response to the primary care request "What is good for a cold?" should a pharmacist:				
<u>BEHAVIOURS</u>	<u>Mean</u>	<u>S.D.</u>	<u>Range</u>	<u>$\frac{Q3-Q1}{2}$</u>
*1. Ask who it was for.	4.90	.3162	1.00	.00
*2. Ask for a description of the ailment.	5.00	.0000	.00	.00
*3. Ask about a fever.	4.90	.3162	1.00	.00
*4. Ask for a description of any cough.	4.90	.3162	1.00	.00
*5. Ask about the duration of the symptoms.	4.79	.4216	1.00	.00
*6. Ask about allergies.	4.40	.8432	2.00	.50
*7. Ask about the use of prescrip- tion drugs.	4.79	.4216	1.00	.00
*8. Ask about the use of non- prescription drugs.	4.50	.6992	2.00	.00
*9. Direct you to a clerk for assistance.	1.00	.0000	.00	.00
10. Ask another pharmacist to help.	3.50	.5270	1.00	.50
*11. Without asking about the symp- toms direct you to the "cough and cold" section out front.	1.20	.4216	1.00	.00
*12. Without asking about the symp- toms recommend a product.	1.44	.7264	2.00	.50
*13. Without asking about symptoms, suggest that you see a physician.	1.79	.4216	1.00	.00
*14. Suggest the condition is not serious and, therefore, does not warrant treatment with a non-prescription product.	1.50	.7071	2.00	.50
*15. Without inquiring about the symptoms, recommend a product to relieve the symptoms and suggest you see a physician.	1.70	.8232	2.00	.50

TABLE III Cont.

BEHAVIOURS	Mean	S.D.	Range	$\frac{Q3-Q1}{2}$
**16. Recommend a product after inquiring about the symptoms.	3.79	1.0327	3.00	1.00
**17. After inquiring about the symptoms, recommend seeing a physician.	4.09	.8755	2.00	1.00
**18. Inquire about the symptoms, recommend a product and suggest seeing a physician.	4.29	.8232	2.00	.50
19. After inquiring about symptoms, recommend a cough product.	3.59	.6992	2.00	.50
20. After inquiring about the symptoms recommend a topical decongestant or an oral cold product.	3.50	.7071	2.00	.50
*21. Indicate how to use the product.	4.50	.5270	1.00	.50
*22. Indicate when to use the product.	4.50	.5270	1.00	.50
*23. Indicate how long to take product.	4.50	.5270	1.00	.50
*24. Explain why it is appropriate or inappropriate to use a particular product given the symptoms described, prescription drugs being used etc.	4.20	.6324	2.00	.50
25. Come out from behind the dispensary counter when discussing your problem.	3.40	.6992	2.00	.50
26. Caution about side effects.	4.44	.5270	1.00	.50
*27. After inquiring about the symptoms, recommending a product only.	2.00	.0000	.00	.00

*Used as a final criterion in the evaluation of the pharmacists.

**These three behaviours were combined into the following two criteria:

- i. After inquiring about the symptoms, recommend a product, suggest consulting a physician.
- ii. After inquiring about the symptoms suggest consulting a physician.

TABLE IV

JUDGES' RATINGS OF THE INDIVIDUAL
BEHAVIOURS SUGGESTED FOR ISAP THREE

In response to the primary care request "What is the strongest pain reliever I may purchase without a prescription?" should a pharmacist:				
BEHAVIOURS	Mean	S.D.	Range	$\frac{Q3-Q1}{2}$
* 1. Ask who it was for.	5.00	.0000	.00	.00
* 2. Ask what the product is to be used for.	4.79	.4216	1.00	.00
* 3. Ask for a description of the pain.	4.79	.4216	1.00	.00
* 4. Ask about the duration of the pain.	4.90	.3162	1.00	.00
* 5. Ask about allergies.	4.40	.8432	2.00	.50
* 6. Ask about concurrent use of prescription drugs.	4.70	.6749	2.00	.00
* 7. Ask about concurrent use of non-prescription drugs.	4.70	.6749	2.00	.00
* 8. Ask a clerk to help.	1.20	.4216	1.00	.00
9. Ask another pharmacist to help.	3.00	.0000	.00	.00
*10. Without asking about the symptoms, direct you to the appropriate section out front.	1.20	.4216	1.00	.00
*11. Without asking about the symptoms, suggest a product.	1.40	.5639	1.00	.50
*12. Without asking about the symptoms, suggest consulting a physician.	1.70	.4830	1.00	.50
*13. Suggest condition not serious and, therefore, does not warrant treatment with a non-prescription product.	1.70	.4830	1.00	.50
*14. Suggest consulting a physician after taking a history.	2.79	.9189	3.00	.50
*15. Suggest a non-prescription product containing ASA.	2.09	.9944	3.00	1.00

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TABLE IV Cont.

BEHAVIOURS	Mean	S.D.	Range	$\frac{Q3-Q1}{2}$
16. Recommend a product containing codeine.	3.00	.0000	.00	.00
**17. Suggest a non-prescription product after inquiring about the symptoms.	4.20	.6324	2.00	.50
**18. Suggest a non-prescription product which does not contain ASA.	3.90	.7378	2.00	.50
**19. Suggest seeing a physician if condition persists.	4.79	.4216	1.00	.00
*20. Indicate how long to use the product.	4.59	.5163	1.00	.50
*21. Indicate when to take the product.	4.50	.5270	1.00	.50
*22. Indicate how to take the product.	4.50	.5270	1.00	.50
*23. Explain why a particular product was appropriate or inappropriate to use in this particular case.	4.29	.6749	2.00	.50
24. Come out from behind the counter to discuss your problem or to discuss a product.	3.70	.6749	2.00	.50
25. Ask about concurrent disease states.	4.40	.6992	2.00	.50

*Used as a final criterion in the evaluation of the pharmacists.

**These three behaviours were combined into the 2 criteria:

- i. After inquiring about the symptoms, recommend a product not containing ASA and suggest consulting a physician if the symptoms persist.
- ii. After inquiring about the symptoms, recommend a product not containing ASA.

TABLE V.

JUDGES' RATINGS OF THE INDIVIDUAL
BEHAVIOURS SUGGESTED FOR ISAP FOUR

In response to the primary care request "What is the strongest pain reliever I may purchase without a prescription?" should the pharmacist:				
BEHAVIOURS	Mean	S.D.	Range	$\frac{Q3-Q1}{2}$
* 1. Ask who it is for	4.90	.3162	1.00	.00
* 2. Ask what the product is needed for.	4.90	.3162	1.00	.00
* 3. Ask for a description of the ailment.	5.00	.0000	.00	.00
* 4. Ask about the duration of the pain.	4.90	.3162	1.00	.00
* 5. Ask about allergies.	4.29	.9486	2.00	1.00
* 6. Ask about the concurrent use of prescription drugs.	4.70	.6749	2.00	.00
* 7. Ask about the concurrent use of non-prescription drugs.	4.70	.6749	2.00	.00
* 8. Ask a clerk to help.	1.09	.3162	1.00	.00
9. Ask another pharmacist to help.	3.00	.0000	.00	.00
*10. Direct you to the appropriate section out front.	1.29	.4839	1.00	.50
*11. Recommend a product without inquiring about the symptoms.	1.29	.4830	1.00	.50
*12. Suggest consulting a physician without inquiring about the symptoms.	1.59	.5163	1.00	.50
*13. Suggest that the condition is not serious enough to warrant treatment with a non-prescription medication.	1.20	.4216	1.00	.00
*14. Recommend a product not containing ASA.	1.90	.7378	2.00	.50
*15. Recommend a product containing codeine.	2.40	.6992	1.00	.50

TABLE V Cont.

<u>BEHAVIOURS</u>	<u>Mean</u>	<u>S.D.</u>	<u>Range</u>	<u>$\frac{Q3-Q1}{2}$</u>
**16. After inquiring about the symptoms, recommend a product.	3.77	.8333	2.00	.50
**17. Recommend a product containing ASA.	4.09	.7378	2.00	.50
**18. Recommend consulting a physician after inquiring about the symptoms.	4.29	.6749	2.00	.00
**19. Recommend increasing the dose of ASA and consulting a physician about the condition.	4.29	.6749	2.00	.00
*20. Indicate how long to use product.	4.59	.5163	1.00	.50
*21. Indicate when to take product.	4.59	.5163	1.00	.50
*22. Indicate how to take product.	4.59	.5163	1.00	.50
*23. Explain why it is appropriate or inappropriate to use a particular product given the symptoms, prescription drugs used, etc.	4.40	.5163	1.00	.50
24. Come from behind the dispensary counter to discuss your problem or to discuss a particular product.	3.79	.6324	1.00	.50

*Used as a final criterion in the evaluation of the pharmacists.

**These four behaviours were combined into the following two criteria:

- i. After inquiring about the symptoms, suggest increasing the dose of ASA or recommending a product containing ASA (but not codeine) and suggest seeing a physician.
- ii. After inquiring about the symptoms, suggest consulting a physician.

TABLE VIII
INTERCORRELATIONS OF JUDGES' RATINGS OF THE BEHAVIOURS
IN ALL FOUR ISAP's COMBINED

<u>Judge</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
1		.7716	.8771	.7716	.8565	.8272	.8725	.9089	.8054	.8124
2			.7252	.7244	.8032	.8258	.7908	.8300	.8067	.7278
3				.6959	.8612	.8014	.8223	.8245	.8138	.7724
4					.7986	.7747	.8119	.7947	.8602	.8106
5						.7648	.8353	.8643	.8344	.8323
6							.8199	.8073	.7912	.7596
7								.88 7	.7967	.8428
8									.8151	.8067
9										.7959
10										

Mean correlation = 0.8099

PERFORMANCE CHECKLIST

PROBLEM 1 In response to the question, "what is good for a cold?"
Did the Pharmacist: (Indicate YES or NO)

1. _____ Ask who it was for
2. _____ Inquire about the symptoms
3. _____ Ask about fever
4. _____ Ask for a description of any cough
5. _____ Ask about the duration of the symptoms
6. _____ Ask about allergies
7. _____ Ask about concurrent use of prescription drugs
8. _____ Ask about concurrent use of non-prescription drugs
9. _____ Direct you to a clerk for assistance
10. _____ Without asking about the symptoms, direct you to the "cough and cold" section out front.
11. _____ Without asking about symptoms etc., recommend a product
12. _____ Without asking about the symptoms etc., direct you to a physician for assistance.
13. _____ After inquiring about the symptoms etc., direct you to a physician
14. _____ Suggest that the condition is not serious enough to warrant treatment with a non-prescription product
15. _____ Recommend a product containing a sympathomimetic amine
16. _____ After inquiring about the symptoms etc., recommend a product
17. _____ Recommend a topical decongestant or an oral product containing no sympathomimetic amines
18. _____ Recommend a sugarless cough product after inquiring about symptoms
19. _____ Suggest seeing a physician if the symptoms persist
20. _____ Indicate how to use the product
21. _____ Indicate when to take the product
22. _____ Indicate how long to take the product
23. _____ Explain why it is appropriate or inappropriate to use a particular product given the symptoms and other factors (prescription drugs taken etc.)
24. _____ Come out from behind the dispensary counter to discuss your problem

PROBLEM 1 contd.

Name of product recommended _____

Price of product recommended _____

Comments _____

PERFORMANCE CHECKLIST

PROBLEM 2 In response to the question, "What is good for a cold?"
Did the Pharmacist (Indicate YES or NO)

1. _____ Ask who it was for
2. _____ Ask for a description of the ailment
3. _____ Ask about a fever
4. _____ Ask for a description of any cough
5. _____ Ask about the duration of the symptoms
6. _____ Ask about allergies
7. _____ Ask about concurrent use of prescription drugs
8. _____ Ask about concurrent use of non-prescription drugs
9. _____ Direct you to a clerk for assistance
10. _____ Without asking about the symptoms direct you to the "cough and cold" section out front
11. _____ Without asking about the symptoms recommend a product
12. _____ Without asking about the symptoms suggest that you see a physician
13. _____ Suggest that the condition is not serious and, therefore, does not warrant treatment with a non-prescription product
14. _____ Without inquiring about the symptoms, recommend a product to relieve the symptoms and suggest you see a physician
15. _____ Recommend a product after inquiring about the symptoms
16. _____ After inquiring about the symptoms recommend seeing a physician
17. _____ Inquire about the symptoms, recommend a product and suggest seeing a physician
18. _____ Recommend a cough product after inquiring about symptoms
19. _____ Recommend a topical decongestant or an oral cold product after inquiring about symptoms
20. _____ Indicate how to use the product
21. _____ Indicate when to use the product
22. _____ Indicate how long to use the product
23. _____ Explain why it is appropriate or inappropriate to use a particular product given the symptoms described, prescription drugs being used etc.
24. _____ Come out from behind the dispensary counter when discussing your problem

PROBLEM 2.contd.

25. _____ Caution about side effects

Name of product recommended _____

Price of product recommended _____

Comments _____

PERFORMANCE CHECKLIST

PROBLEM 3 In response to the question, "What is the strongest pain reliever I may purchase without a prescription?"
Did the pharmacist: (Indicate YES or NO)

1. _____ Ask who it was for
2. _____ Ask what the product is to be used for
3. _____ Ask for a description of the pain
4. _____ Ask about the duration of the pain (How long has the person had the headache?)
5. _____ Ask about allergies
6. _____ Ask about concurrent use of prescription drugs
7. _____ Ask about concurrent use of non-prescription drugs
8. _____ Ask a clerk to help
9. _____ Without asking about the symptoms direct you to the appropriate section out front
10. _____ Without asking about the symptoms, suggest a product
11. _____ Without asking about the symptoms, suggest consulting a physician
12. _____ Suggest the condition is not serious and, therefore, does not warrant treatment with a non-prescription product
13. _____ Suggest consulting a physician after taking a history
14. _____ Suggest a non-prescription product containing ASA
15. _____ Suggest a non-prescription product after inquiring about symptoms
16. _____ Suggest a non-prescription product which does not contain ASA
17. _____ Suggest seeing a physician if condition persists
18. _____ Indicate how long to use the product
19. _____ Indicate when to take the product
20. _____ Indicate how to take the product
21. _____ Explain why a particular product was appropriate or inappropriate to use in this particular case
22. _____ Come out from behind the counter to discuss your problem or to discuss a product
23. _____ Ask about concurrent disease states

PROBLEM 3 contd.

Name of product recommended _____

Price of product recommended _____

Comments _____

PERFORMANCE CHECKLIST

PROBLEM 4 In response to the question, "What is the strongest pain reliever I may purchase without a prescription?"
Did the Pharmacist: (Indicate YES or No)

1. ☐ Ask who it is for
2. ☐ Ask what the product is needed for
3. ☐ Ask for a description of the ailment
4. ☐ Ask about the duration of the pain
5. ☐ Ask about allergies
6. ☐ Ask about concurrent use of prescription drugs
7. ☐ Ask about concurrent use of non-prescription drugs
8. ☐ Ask a clerk to help
9. ☐ Direct you to the appropriate section out front
10. ☐ Recommend a product without inquiring about the symptoms
11. ☐ Suggest consulting a physician without inquiring about the symptoms
12. ☐ Suggest that the condition is not serious enough to warrant treatment with a non-prescription medication
13. ☐ Recommend a product not containing ASA
14. ☐ Recommend a product containing codeine
15. ☐ After inquiring about the symptoms, recommending a product
16. ☐ Recommend a product containing ASA
17. ☐ Recommend consulting a physician after inquiring about the symptoms
18. ☐ Recommend increasing the dose of ASA and consulting a physician about the condition
19. ☐ Indicate how long to use the product
20. ☐ Indicate when to take the product
21. ☐ Indicate how to take the product
22. ☐ Explain why it is appropriate or inappropriate to use a particular product given the symptoms, prescription drugs used etc.
23. ☐ Come out from behind the dispensary counter to discuss your problem or to discuss a particular product

Name of product recommended _____

Price of product recommended _____

Comments _____

PERFORMANCE CRITERIA USED IN EVALUATING
A PHARMACIST'S RESPONSE TO ISAP ONE

(COLD APPROPRIATE): "What is good for a cold?"

DATA GATHERING

1. Ask who it was for
2. Inquire about the symptoms
3. Ask about fever
4. Ask for a description of any cough
5. Ask about the duration of the symptoms
6. Ask about allergies
7. Ask about concurrent use of prescription drugs
8. Ask about concurrent use of non-prescription drugs

INAPPROPRIATE RECOMMENDATIONS

9. Direct you to a clerk for assistance
10. Without asking about the symptoms, direct you to the "cough and cold" section out front
11. Without asking about symptoms etc., recommend a product
12. Without asking about the symptoms etc., direct you to a physician for assistance
13. After inquiring about the symptoms etc., direct you to a physician
14. Suggest that the condition is not serious enough to warrant treatment with a non-prescription product
15. Recommend a product containing a sympathomimetic amine

APPROPRIATE RECOMMENDATIONS

16. After inquiring about the symptoms, recommend a topical decongestant or an oral sugarless product which does not contain a sympathomimetic amine and suggest consulting a physician if symptoms persist
17. After inquiring about the symptoms, recommend a topical decongestant or an oral sugarless product containing no sympathomimetic amines

DRUG USE COUNSELLING

18. Indicate how to use the product
19. Indicate when to take the product
20. Indicate how long to take the product
21. Explain why it is appropriate or inappropriate to use a particular product given the symptoms and other factors (prescription drugs taken etc.)

PERFORMANCE CRITERIA USED IN EVALUATING
A PHARMACIST'S RESPONSE TO ISAP TWO

(COLD INAPPROPRIATE): "What is good for a cold?"

DATA GATHERING

1. Ask who it was for
2. Ask for a description of the ailment
3. Ask about a fever
4. Ask for a description of any cough
5. Ask about the duration of the symptoms
6. Ask about allergies
7. Ask about concurrent use of prescription drugs
8. Ask about concurrent use of non-prescription drugs

INAPPROPRIATE RECOMMENDATIONS

9. Direct you to a clerk for assistance
10. Without asking about the symptoms direct you to the "cough" and "cold" section out front
11. Without asking about the symptoms recommend a product
12. Without asking about the symptoms suggest that you see a physician
13. Suggest that the condition is not serious and, therefore, does not warrant treatment with a non-prescription product.
14. Without inquiring about the symptoms, recommend a product to relieve the symptoms and suggest you see a physician
15. After inquiring about the symptoms, recommending a product only

APPROPRIATE RECOMMENDATIONS

16. After inquiring about the symptoms, recommend a product, suggest consulting a physician
17. After inquiring about the symptoms, suggest consulting a physician

DRUG USE COUNSELLING

18. Indicate how to use the product
19. Indicate when to use the product
20. Indicate how long to use the product
21. Explain why it is appropriate or inappropriate to use a particular product

PERFORMANCE CRITERIA USED IN EVALUATING
A PHARMACIST'S RESPONSE TO ISAP THREE

(PAIN APPROPRIATE): "What is the strongest pain reliever I may purchase without a prescription?"

DATA GATHERING

1. Ask who it was for
2. Ask what the product is to be used for
3. Ask for a description of the pain
4. Ask about the duration of the pain (how long has the person had the headache)
5. Ask about allergies
6. Ask about concurrent use of prescription drugs
7. Ask about concurrent use of non-prescription drugs

INAPPROPRIATE RECOMMENDATIONS

8. Ask a clerk to help
9. Without asking about the symptoms direct you to the appropriate section out front
10. Without asking about the symptoms, suggest a product
11. Without asking about the symptoms, suggest consulting a physician
12. Suggest the condition is not serious and, therefore, does not warrant treatment with a non-prescription product
13. Suggest consulting a physician after taking a history
14. Suggest a non-prescription product containing ASA

APPROPRIATE RECOMMENDATIONS

15. After inquiring about the symptoms, recommend a product not containing ASA and suggest consulting a physician if the symptoms persist
16. After inquiring about the symptoms, recommend a product not containing ASA

DRUG USE COUNSELLING

17. Indicate how long to use the product
18. Indicate when to take the product
19. Indicate how to take the product
20. Explain why a particular product was appropriate or inappropriate to use in this particular case

PERFORMANCE CRITERIA USED IN EVALUATING
A PHARMACIST'S RESPONSE TO ISAP FOUR

(PAIN INAPPROPRIATE): "What is the strongest pain reliever I may purchase without a prescription?"

DATA GATHERING

1. Ask who it is for
2. Ask what the product is needed for
3. Ask for a description of the ailment
4. Ask about the duration of the pain
5. Ask about allergies
6. Ask about concurrent use of prescription drugs
7. Ask about concurrent use of non-prescription drugs

INAPPROPRIATE RECOMMENDATIONS

8. Ask a clerk to help
9. Direct you to the appropriate section out front
10. Recommend a product without inquiring about the symptoms
11. Suggest consulting a physician without inquiring about the symptoms
12. Suggest that the condition is not serious enough to warrant treatment with a non-prescription medication
13. Recommend a product not containing ASA
14. Recommend a product containing codeine

APPROPRIATE RECOMMENDATIONS

15. After inquiring about the symptoms, suggest increasing the dose of ASA or recommending a product containing ASA (but not codeine) and suggest seeing a physician
16. After inquiring about the symptoms, suggest consulting a physician

DRUG USE COUNSELLING

17. Indicate how long to use the product
18. Indicate when to take the product
19. Indicate how to take the product
20. Explain why it is appropriate or inappropriate to use a particular product given the symptoms, prescription drugs used etc.

DIRECTIONS FOR OBSERVERS

General Procedure

Present the situation to each of the pharmacists assigned to you. It is most important that you strive to make your presentations identical for each pharmacist. Memorize the background information and the wording of the basic questions and rehearse the full presentation before your first visit so you can concentrate on observing the pharmacist's response.

For each visit, follow the standard field observation procedure (see attached sheet). Be accurate in your clock readings when timing the situational factors. Be sure to complete all parts of the Visit Record Sheet.

Place completed Visit Record Sheets, purchased items and all receipts in the manila envelope for each pharmacist.

Dress and Manner During Visits

To prevent unusual reactions to your dress you are requested to wear clothing which is neither conspicuously poor nor conspicuously glamorous.

Practice a polite, interested manner for your presentation to the pharmacist. Accept his statements agreeably and comply with the pharmacist's recommendations. If a disagreeable situation arises react with surprised silence without comment, and leave. Verbal exchanges may lead to statements which would jeopardize the entire study.

If your authenticity as a customer is challenged leave the pharmacy and be sure to report such challenges on your observation sheet.

Identifying the Pharmacist

It is critical to the study that you present the situations only to the pharmacists assigned to you. Assignments are based upon the best information available, but since pharmacists do change jobs you will need to check the location of the pharmacist before your first visit.

You will be supplied with the name, approximate age, physical description, last known working address and telephone number of each pharmacist. Just before your visit, call the pharmacy. If a clerk answers, ask for the pharmacist by name. Attempt to find out when the pharmacist is working, or if the pharmacist is working elsewhere, where

his new position is. If asked why, say he helped you before and you have another problem.

If the assigned pharmacist answers the telephone, say your neighbour told you he/she could help you and from the attached list of special questions, ask one. Also, ask if he/she will be in the store so you will know who to talk to when you go to buy the item.

When you enter the store ask the clerk if the assigned pharmacist is in. Try to get her to point him or her out to you. Look for a man or a woman about the right age, wearing some type of white jacket. Also look for an identifying name tag or certificate. If there is no clerk, use all the visible clues you can and carefully note the pharmacist's description for the record sheet.

If you are not sure you have the right pharmacist do NOT attempt the presentation.

If you are unsuccessful in locating and/or identifying the pharmacist, report this fact to the co-ordinator. Meanwhile, proceed with the next pharmacist on the list.

OBSERVATION PROCEDURE

Before Visit:

1. Review the test situation
2. Locate the pharmacist
 - call up to see if on duty
 - and for how long

During Visit:

1. Carefully observe situational factors
2. Present problem to pharmacist
3. Carefully observe pharmacist's response

After Visit:

1. Immediately return to car, out of sight of pharmacy
2. Fill in performance checklist and visit record sheet
3. Store Visit Record Sheet, purchased items, and receipts in the pharmacist's manila envelope
4. Keep all data in a safe place.

Use these questions, if necessary, as reasons for asking for the pharmacist by name. Say a neighbour referred you to him.

1. That you will be travelling to the tropics; Fiji, New Zealand, Australia, Kenya and Tanzania. A friend has told you that you should take anti-malaria pills - Chloroquine. Are they available without a prescription? If not, are there any anti-malaria pills available without a prescription?
2. You are travelling to Mexico. On your last trip to Mexico you bought some Entero Vioform in case of diarrhegia. You want to buy some more but you have been told by a friend that they now require a prescription. Is it true?

Visit Record Sheet

Observer _____ Date of Visit _____

Situation No. _____ Pharmacist's Name _____

A. Description of the Pharmacist

W _____ B _____ O _____ Ht _____ Wt _____ Age _____

Male _____ Female _____

Build: Slight _____ Medium _____ Large _____

Hair: Bald _____ Normal _____ Long _____ Sideburns _____ Color _____

Mustache: Yes _____ No _____

Beard: Yes _____ No _____

B. Situational Factors (Record time to the nearest minute)

Time in store door: _____

Time greeted by pharmacist: _____

Time finished with pharmacist: _____

Time out store door: _____

What was the pharmacist doing when you approached the prescription counter?

(Filling prescriptions, stocking shelves, etc.) _____

Did he appear to have many prescriptions waiting? Yes _____ No _____

How many pharmacists were on duty during your visit? _____

How many other patrons were at the prescription counter? _____

How many customers were in the whole store? _____

How many customers were waiting at cash register 1? _____
cash register 2? _____

How many clerks were on duty? _____

C. Treatment Scale

Rate the pharmacist's treatment of you and your request by circling the number of each of the following scales which best matches her/his behaviour during this visit. Be sure to rate every scale.

<u>Treatment of</u>	v = very	Q = quite				S = Slight			N = neither
		<u>V</u>	<u>Q</u>	<u>S</u>	<u>N</u>	<u>S</u>	<u>Q</u>	<u>V</u>	
You as a Person	friendly	1	2	3	4	5	6	7	hostile
	polite	1	2	3	4	5	6	7	rude
	for	1	2	3	4	5	6	7	against
	encouraging	1	2	3	4	5	6	7	discouraging
	accepting	1	2	3	4	5	6	7	questioning
Over-the-counter drug	leisurely	1	2	3	4	5	6	7	hurried
	prompt	1	2	3	4	5	6	7	slow
	confident	1	2	3	4	5	6	7	unsure
	interested	1	2	3	4	5	6	7	disinterested
	positive	1	2	3	4	5	6	7	negative
	willing	1	2	3	4	5	6	7	reluctant

TABLE XXIV CORRELATION MATRIX REPRESENTING THE RELATIONSHIPS BETWEEN THE TOTAL SCORE, ITS FOUR COMPONENTS AND THE SITUATIONAL FACTORS IN THE PRE-IN-STORE-ASSESSMENT FOR THE EXPERIMENTAL GROUP

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1.00																
2	<u>-0.57</u>	1.00															
3	<u>0.45</u>	<u>-0.75</u>	1.00														
4	<u>0.51</u>	-0.32	0.31	1.00													
5	<u>0.89</u>	<u>-0.70</u>	<u>0.65</u>	<u>0.77</u>	1.00												
6	-0.11	0.33	-0.14	-0.14	-0.19	1.00											
7	-0.02	-0.02	-0.13	0.26	0.06	-0.23	1.00										
8	<u>0.59</u>	<u>-0.47</u>	<u>0.61</u>	<u>0.44</u>	<u>0.66</u>	-0.21	0.04	1.00									
9	-0.32	0.21	-0.19	-0.34	<u>-0.38</u>	0.05	-0.14	-0.22	1.00								
10	-0.01	0.08	-0.13	0.00	-0.03	0.09	-0.21	-0.08	0.04	1.00							
11	0.01	-0.14	0.10	0.23	0.14	0.01	<u>0.34</u>	0.42	-0.22	0.20	1.00						
12	0.10	-0.16	0.07	-0.03	0.10	0.11	0.23	0.25	-0.12	0.30	<u>0.64</u>	1.00					
13	0.08	-0.22	0.10	-0.11	0.08	0.14	-0.28	0.02	-0.24	0.05	0.03	<u>0.50</u>	1.00				
14	0.17	-0.24	0.15	<u>-0.40</u>	0.00	0.00	-0.20	-0.24	<u>-0.38</u>	0.25	-0.10	<u>0.36</u>	<u>0.51</u>	1.00			
15	0.06	-0.15	0.06	0.09	0.11	<u>-0.49</u>	<u>0.38</u>	0.15	<u>-0.48</u>	0.05	0.53	0.63	0.29	<u>0.38</u>	1.00		
16	<u>-0.71</u>	<u>0.45</u>	<u>-0.45</u>	<u>-0.71</u>	<u>-0.80</u>	-0.01	-0.15	<u>-0.48</u>	0.29	0.00	-0.06	-0.06	0.08	0.32	-0.00	1.00	
17	<u>-0.57</u>	<u>0.38</u>	-0.35	<u>-0.60</u>	-0.67	0.08	0.11	<u>-0.37</u>	<u>0.41</u>	-0.19	0.04	-0.06	-0.15	-0.02	-0.00	<u>0.67</u>	1.00

Correlation coefficients of 0.36 are significant at the 0.05 level with 29 degrees of freedom. Correlation coefficients of 0.46 are significant at the 0.01 level with 29 degrees of freedom.

1=Data gathering, 2=Inappropriate recommendations, 3=Appropriate recommendations, 4=Drug-use-counselling, 5=Total Score, 6=Age, 7=Time to be greeted by pharmacist, 8=Time spent with pharmacist, 9=Busy, 10=Number of pharmacists working in the dispensary, 11=Number of consumers at the prescription counter, 12=Number of consumers in the whole store, 13=Number of consumers at cash register one, 14=Number of consumers at cash register two, 15=Number of clerks, 16=Pharmacist's treatment of the consumer, 17=Pharmacist's treatment of the consumer's request for a non-prescription product.

TABLE XXV. CORRELATION MATRIX REPRESENTING THE RELATIONSHIPS BETWEEN THE TOTAL SCORE, ITS FOUR COMPONENTS AND THE SITUATIONAL FACTORS IN THE POST-IN-STORE-ASSESSMENT OF THE EXPERIMENTAL GROUP

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1.00																
2	<u>-0.47</u>	1.00															
3	<u>0.37</u>	<u>-0.68</u>	1.00														
4	0.49	-0.26	0.14	1.00													
5	<u>0.86</u>	<u>-0.70</u>	<u>0.62</u>	<u>0.73</u>	1.00												
6	0.11	-0.34	<u>0.41</u>	<u>0.86</u>	0.26	1.00											
7	-0.29	<u>0.53</u>	-0.20	<u>-0.49</u>	<u>-0.49</u>	0.13	1.00										
8	<u>0.53</u>	<u>-0.42</u>	<u>0.41</u>	<u>0.40</u>	<u>0.60</u>	0.27	<u>-0.36</u>	1.00									
9	0.06	0.19	-0.14	0.17	0.02	-0.15	-0.07	-0.23	1.00								
10	0.01	0.23	-0.16	-0.07	-0.11	0.05	0.23	0.15	<u>-0.39</u>	1.00							
11	0.03	0.02	-0.06	-0.32	-0.14	-0.08	0.21	-0.05	<u>-0.39</u>	0.17	1.00						
12	-0.13	0.15	-0.03	-0.31	-0.23	-0.07	<u>0.48</u>	-0.15	-0.34	0.07	<u>0.55</u>	1.00					
13	-0.18	0.21	-0.28	-0.28	-0.31	-0.18	<u>0.37</u>	-0.28	<u>-0.37</u>	-0.03	0.52	<u>0.74</u>	1.00				
14	-0.13	-0.05	0.02	0.03	-0.04	-0.19	-0.05	0.20	-0.32	-0.01	0.24	<u>0.60</u>	<u>0.64</u>	1.00			
15	-0.05	0.28	-0.09	-0.34	-0.24	-0.07	<u>0.60</u>	-0.20	-0.30	0.16	<u>0.60</u>	<u>0.75</u>	<u>0.57</u>	0.30	1.00		
16	<u>-0.49</u>	<u>0.42</u>	-0.00	<u>-0.47</u>	<u>-0.51</u>	-0.06	0.36	<u>-0.54</u>	0.09	0.17	-0.07	0.18	-0.01	-0.11	0.22	1.00	
17	<u>-0.43</u>	0.19	0.00	<u>-0.37</u>	<u>-0.39</u>	-0.14	0.09	<u>-0.50</u>	0.19	0.04	0.05	-0.02	-0.00	0.05	0.25	<u>0.66</u>	1.00

Correlation coefficients of 0.36 are significant at the 0.05 level with 29 degrees of freedom. Correlation coefficients of 0.46 are significant at the 0.01 level with 29 degrees of freedom.

1=Data gathering, 2=Inappropriate recommendations, 3=Appropriate recommendations, 4=Drug-use-counselling, 5=Total Score, 6=Age, 7=Time to be greeted by pharmacist, 8=Time spent with pharmacist, 9=Busy, 10=Number of pharmacists working in the dispensary, 11=Number of consumers at the prescription counter, 12=Number of consumers in the whole store, 13=Number of consumers at cash register one, 14=Number of consumers at cash register two, 15=Number of clerks, 16=Pharmacist's treatment of the consumer, 17=Pharmacist's treatment of the consumer's request for a non-prescription product.

TABLE XXVI: CORRELATION MATRIX REPRESENTING THE RELATIONSHIPS BETWEEN THE TOTAL SCORE, ITS COMPONENTS AND THE SITUATIONAL FACTORS FOR THE PRE-IN-STORE-ASSESSMENT FOR THE CONTROL GROUP

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1.00																
2	0.20	1.00															
3	0.01	<u>-0.47</u>	1.00														
4	<u>0.69</u>	0.22	-0.13	1.00													
5	<u>0.93</u>	-0.01	0.20	<u>0.80</u>	1.00												
6	0.97	-0.27	0.13	-0.02	0.10	1.00											
7	0.11	0.00	-0.00	0.37	0.21	-0.23	1.00										
8	0.18	0.13	-0.04	0.18	0.17	0.27	0.12	1.00									
9	-0.18	-0.37	0.28	-0.15	-0.04	0.27	<u>-0.42</u>	-0.00	1.00								
10	-0.25	-0.25	0.11	-0.21	-0.21	0.14	-0.07	-0.19	-0.29	1.00							
11	-0.08	0.07	0.17	-0.22	-0.13	-0.27	0.09	-0.16	-0.23	0.25	1.00						
12	0.01	-0.01	0.10	0.09	0.05	-0.19	0.31	-0.13	-0.47	0.25	<u>0.48</u>	1.00					
13	0.17	0.12	0.25	-0.02	0.11	-0.16	-0.02	0.05	-0.14	-0.02	<u>0.46</u>	<u>0.58</u>	1.00				
14	0.19	-0.12	0.00	<u>0.51</u>	0.31	-0.18	0.28	0.02	-0.33	-0.10	0.32	<u>0.95</u>	<u>0.79</u>	1.00			
15	0.05	-0.14	0.17	0.01	0.06	-0.34	0.15	-0.26	-0.11	0.21	<u>0.38</u>	<u>0.49</u>	<u>0.45</u>	0.37	1.00		
16	<u>-0.42</u>	-0.02	-0.20	-0.21	<u>-0.40</u>	0.05	-0.02	-0.01	0.19	0.03	0.20	0.00	-0.05	-0.03	0.10	1.00	
17	-0.10	-0.21	-0.01	-0.05	-0.05	0.18	0.07	0.10	<u>0.44</u>	-0.11	0.07	-0.20	-0.80	-0.30	0.02	<u>0.42</u>	1.00

Correlation coefficients of 0.38 are significant at the 0.05 level with 25 degrees of freedom. Correlation coefficients of 0.49 are significant at the 0.01 level with 25 degrees of freedom.

1=Data gathering, 2=Inappropriate recommendations, 3=Appropriate recommendations, 4=Drug-use-counselling, 5=Total Score, 6=Age, 7=Time to be greeted by pharmacist, 8=Time spent with pharmacist, 9=Busy, 10=Number of pharmacists working in the dispensary, 11=Number of consumers at the prescription counter, 12=Number of consumers in the whole store, 13=Number of consumers at cash register one, 14=Number of consumers at cash register two, 15=Number of clerks, 16=Pharmacist's treatment of the consumer, 17=Pharmacist's treatment of the consumer's request for a non-prescription product.

TABLE XXVII CORRELATION MATRIX REPRESENTING THE RELATIONSHIPS BETWEEN THE TOTAL SCORE, ITS COMPONENTS AND THE SITUATIONAL FACTORS FOR THE POST-IN-STORE-ASSESSMENT FOR THE CONTROL GROUP

Vari- albe	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1.00																
2	-0.06	1.00															
3	<u>0.49</u>	<u>-0.43</u>	1.00														
4	0.30	0.21	0.00	1.00													
5	<u>0.88</u>	-0.30	<u>0.65</u>	<u>0.54</u>	1.00												
6	0.05	0.29	0.04	0.03	-0.01	1.00											
7	-0.07	-0.06	-0.09	-0.08	-0.09	<u>-0.54</u>	1.00										
8	0.10	0.17	0.02	0.30	0.13	-0.01	0.10	1.00									
9	-0.25	-0.12	-0.10	-0.01	-0.19	0.23	-0.25	-0.17	1.00								
10	-0.10	0.13	-0.11	-0.05	-0.13	-0.03	0.05	-0.09	-0.09	1.00							
11	-0.09	0.07	-0.04	-0.18	-0.15	-0.14	0.36	-0.05	<u>-0.54</u>	0.25	1.00						
12	-0.24	0.00	-0.17	0.21	-0.11	<u>-0.40</u>	0.36	0.09	-0.33	0.37	<u>0.52</u>	1.00					
13	-0.20	-0.15	0.02	0.24	0.01	-0.27	0.27	0.06	0.02	<u>0.39</u>	<u>0.38</u>	<u>0.76</u>	1.00				
14	0.06	-0.12	0.08	0.38	0.26	-0.04	0.36	-0.05	0.38	<u>0.33</u>	0.21	<u>0.59</u>	<u>0.88</u>	1.00			
15	-0.09	0.29	-0.17	-0.03	-0.18	-0.26	0.32	-0.18	-0.27	<u>0.55</u>	0.34	<u>0.59</u>	0.33	0.17	1.00		
16	<u>-0.31</u>	0.05	-0.16	<u>-0.46</u>	<u>-0.43</u>	0.12	-0.08	-0.25	0.08	0.25	0.17	0.07	0.03	-0.20	0.14	1.00	
17	-0.19	0.16	-0.24	-0.19	-0.30	0.30	-0.11	-0.11	0.27	0.23	0.05	-0.08	-0.06	-0.06	0.01	<u>0.72</u>	1.00

Correlation coefficients of 0.38 are significant at the 0.05 level with 25 degrees of freedom. Correlation coefficients of 0.49 are significant at the 0.01 level with 25 degrees of freedom.

1=Data gathering, 2=Inappropriate recommendations, 3=Appropriate recommendations, 4=Drug-use-counselling, 5=Total Score, 6=Age, 7=Time to be greeted by pharmacist, 8=Time spent with pharmacist, 9=Busy, 10=Number of pharmacists working in the dispensary, 11=Number of consumers at the prescription counter, 12=Number of consumers in the whole store, 13=Number of consumers at cash register one, 14=Number of consumers at cash register two, 15=Number of clerks, 16=Pharmacist's treatment of the consumer, 17=Pharmacist's treatment of consumer's request for a non-prescription product.

APPENDIX B: PANEL OF CONTENT EXPERTS

Panel members were drawn from the faculty of Pharmaceutical Sciences at the University of British Columbia and from community pharmacy practitioners in Vancouver, British Columbia.

Panelists

Dennis Andrews, Pharm D.
Assistant Professor,
Division of Clinical Pharmacy.

Loree Eldridge, B.Sc. (Pharm.)
Clinical Instructor,
Community pharmacist with
three years experience.

Peter Hutt, B.Sc. (Pharm.)
Clinical Instructor,
Community pharmacist with
two years experience.

Ronald Ingraham, B.Sc. (Pharm.)
Clinical Instructor,
Community pharmacist with
12 years experience.

Munroe MacKenzie B.S.P.
Clinical Instructor,
Community pharmacist with
24 years experience.

Nicholas Otten, B.Sc. (Pharm.)
Pharmacist, Family Practice Unit, U.B.C.

Karen Pylatuk, B.Sc. (Pharm.), M.Sc.
Lecturer, Division of Clinical Pharmacy,
(speciality drug information).

Ian Sands, B.Sc. (Pharm.) M.Sc.
Clinical Instructor,
Community pharmacist
with three years experience.

Sharon Tudor, B.Sc. (Pharm.)
Chairman of the Division of Clinical Pharmacy,
previously 11 years experience in community pharmacy.

Louanne Twaites, B.S.P.
Health Science Centre Hospital, U.B.C.
Clinical Instructor,
previously 17 years experience in community pharmacy.

APPENDIX C: MATERIALS RELATING TO THE WRITTEN SIMULATIONS

Page

1. Practice Simulation: Entitled The Mystery. (The material contained on the right hand side would normally be invisible)
2. Simulation One
3. Latent Image Responses to Simulation One
4. Simulation Two
5. Latent Image Responses to Simulation Two
6. Simulation Three
7. Latent Image Responses to Simulation Three
8. Simulation Four
9. Latent Image Responses to Simulation Four
10. Figure 3. Simulation One. Possible Paths to Problem Solution
11. Figure 4. Simulation Two. Possible Paths to Problem Solution
12. Figure 5. Simulation Three. Possible Paths to Problem Solution
13. Figure 6. Simulation Four. Possible Paths to Problem Solution
14. Table XIV. Intercorrelations of the Ten Judges' Ratings of the 267 Options in Simulations One to Four.

A MYSTERY

As a young detective assigned to the homicide division, you are called to investigate a death. You arrive at a home full of distraught people: a man, his wife, their son and daughter, the butler and the maid. Grandma has been found dead in bed. On a night table beside her is a glass, nearly empty, containing some brownish liquid. The family asks how soon they may discuss the will with Grandma's lawyer. You begin investigation.

NOW CONTINUE WITH SECTION A.

SECTION A: Data Gathering

In gathering data about the case, you would (Select AS MANY as you consider pertinent at this stage of the investigation);

- | | |
|--|---|
| 1. Ask what Grandma ate for supper the night before. | 1. Tea and toast. |
| 2. Ask who inherits what. | 2. Her son says the family cat got it all. |
| 3. Inquire about Grandma's recent state of health. | 3. Son claims she was healthy and hearty. |
| 4. Check for fingerprints on the glass. | 4. Fingerprints examined appear to match Grandma's. |
| 5. Question everyone about his whereabouts yesterday. | 5. Appropriate alibis are provided by all those present. |
| 6. Perform superficial examination of the body. | 6. No marks or bruises are seen on the body. There is a slight smile on the lips. |
| 7. Try to identify the contents of the glass on the night table. | 7. A liquid smelling of almonds and alcohol. |
| 8. Ascertain that Grandma is dead. | 8. The mirror test shows no vapour information. No heart sounds or pulse. A local doctor pronounces her dead. |

SECTION A CONTINUED ON NEXT PAGE.

You would NOW (Choose ONLY ONE):

- | | |
|--|--|
| 9. Arrest someone for murder. | 9. Continue with Section B. |
| 10. Try to gather more information. | 10. Turn to Section C. |
| 11. Report to your superiors that Grandma is probably a suicide. | 11. You are asked to provide evidence. You are unable to do so and must make another choice from this section. |
| 12. Report to your superiors that Grandma died a natural death. | 12. You are asked to provide evidence. You are unable to do so and must make another choice from this section. |
| 13. Try to revive Grandma. | 13. You are unable to do so and must make another choice from this section |
-

SECTION B: Management

At this time you would arrest (Select AS MANY as you consider suspect):

- | | |
|--------------------------|--|
| 14. The son. | 14. You are rebuked by your superiors since you have not established cause of death, nor have you evidence of opportunity or motive for the accused. |
| 15. The daughter-in-law. | 15. You are rebuked by your superiors since you have not established cause of death, nor have you evidence of opportunity or motive for the accused. |
| 16. The grandson. | 16. You are rebuked by your superiors since you have not established cause of death, nor have you evidence of opportunity or motive for the accused. |
| 17. The granddaughter. | 17. You are rebuked by your superiors since you have not established cause of death, nor have you evidence of opportunity or motive for the accused. |

CONTINUED NEXT PAGE

- | | |
|-----------------|--|
| 18. The maid. | 18. You are rebuked by your superiors since you have not established cause of death, nor have you evidence of opportunity or motive for the accused. |
| 19. The butler. | 19. You are rebuked by your superiors since you have not established cause of death, nor have you evidence of opportunity or motive for the accused. |

UNLESS OTHERWISE DIRECTED IN THE RESPONSE COLUMN, DEVELOP RESPONSE #39 AS SOON AS YOU HAVE COMPLETED THIS SECTION

SECTION C: Data Gathering

In gathering more information, you would (Select AS MANY as you consider pertinent at this stage of the investigation):

- | | |
|---|---|
| 20. Verify what Grandma ate the night before. | 20. Examination of stomach revealed what looks like tea and toast. |
| 21. Verify will with lawyer. | 21. Grandma's lawyer says the cat got it all. |
| 22. Contact Grandma's physician for further information about her recent state of health. | 22. Grandma was a tippler, had a very bad heart condition and was diabetic. He constantly had to refuse her demands for narcotic cough mixutre. |
| 23. Verify fingerprint on the glass. | 23. Grandma's fingerprint verified. |
| 24. Check everyone's alibi for yesterday. | 24. All alibis are verified by reliable witnesses. |
| 25. Obtain physician's report on time and cause of death. | 25. Grandma has been dead for six hours. No evidence of trauma. |
| 26. Verify contents of glass on the night table. | 26. Contents sent to the lab. No cyanide found. Liquid contains sugar, water, peach flavouring, vitamins and small amounts of strychnine. |

At this time you would (Choose ONLY ONE):

- | | |
|---|------------------------|
| 27. Arrest someone if you have not already done so. | 27. Turn to Section B. |
|---|------------------------|

CONTINUED NEXT PAGE

- | | |
|---|---|
| 28. Seek additional information. | 28. Continue with Section D. |
| 29. Report to your superiors that Grandma was a suicide. | 29. Your superiors ask for further evidence; you are unable to provide it and must make another choice from this section. |
| 30. Report to your superiors that Grandma died of natural causes. | 30. Your superiors ask for further evidence; you are unable to provide it and must make another choice from this section. |

SECTION D: Data Gathering

In seeking further information, you would (Select AS MANY as you consider pertinent at this stage of the investigation):

- | | |
|--|---|
| 31. Order chemical analysis of stomach contents. | 31. Analysis reveals sucrose, water, starch, glucose, charcoal and tannic acid (tea and dry toast). |
| 32. Order post mortem examination of the body. | 32. Pathologist tells you his examination reveals that she had a heart attack. |
| 33. Order chemical analysis of blood for strychnine. | 33. Trace found. |
| 34. Order chemical analysis of material in glass on night table. | 34. The chemical composition is consistent with that of a harmless geriatric tonic. |

At this time you would report to your superiors that (Choose ONLY ONE):

- | | |
|---|--|
| 35. Grandma was murdered. | 35. Report returned with some choice epithets. Develop response 39. |
| 36. Grandma was suicide. | 36. Report returned with some choice epithets. Develop response 39. |
| 37. Grandma died of natural causes. | 37. Naturally. END OF PROBLEM. |
| 38. Data regarding cause of death are still inconclusive. | 38. Superiors use some choice epithets in suggesting you find out what an extensive myocardial infarction is. Develop response 39. |

CONTINUED NEXT PAGE

39. An autopsy examination reveals an acute myocardial infarction of entire anterior left ventricle (heart attack). Your superiors tell you that means Grandma died of natural causes. They recommend your prompt demotion.
END OF PROBLEM.

PROBLEM 1

OPENING SCENE

You are a community pharmacist working in a medium size store of a large national chain. The dispensary in this store is slightly elevated and located at the back of a bright and well laid out main floor. The dispensary is of adequate size and is well stocked with references and all the necessary auxiliary equipment.

On this particular day you are the only pharmacist in the dispensary and there are two employees working "out front". It is the noon hour and you are fairly busy. There are a number of phoned-in prescriptions yet to be done and there are two individuals waiting for their prescriptions which you are presently working on. A middle-aged woman enters the store and heads for the dispensary, she stops in front of you and asks the following question, "What have you got for a cold?"

SECTION A

Considering the circumstances just described you would NOW (Choose ONLY ONE):

1. Ask one of the "out front" employees to help her.
2. Recommend that she select a product from the "Cough and Cold" section.
3. Recommend a product which she would recognize because it is advertised on national television.
4. Ask her to be seated and you will be with her very shortly.
5. Since all non-prescription medications designed to relieve the symptoms of the common cold are the same, recommend one that you have found beneficial in the past.
6. Recommend that she contact her physician.
7. Drop what you are doing and walk with her to the "Cough and Cold" section.

SECTION B

At this time you would (Choose ONLY ONE):

8. Recommend a product that you have been recommending for years.
9. Obtain a description of the ailment.
10. Recommend that she see her family physician.
11. Suggest that she wait a few days to see if the "cold" gets better, if not she should contact her family physician.

PROBLEM 1

SECTION C

You would be interested in asking about which of the following (Select AS MANY as you consider ESPECIALLY pertinent):

12. Who has the cold.
13. Individual's age.
14. Fever.
15. Description of any cough
16. Nasal discharge.
17. Nasal congestion.
18. Post nasal drip.
19. Sore throat.
20. Muscle aches and pains.
21. Headache.
22. Swollen glands or sore neck.
23. Nausea and vomiting.
24. Ear ache.
25. Night sweats.
26. Duration of the symptoms.
27. Shortness of breath.
28. Trouble sleeping.
29. Bowel movements.
30. Allergies.
31. If there are any small children around house.
32. Appetite.
33. Does she sleep with a window open.
34. Are there other members of the family afflicted with a "cold".
35. Does she smoke cigarettes.
36. Is she experiencing any indigestion.

At this time you would (Choose ONLY ONE):

37. Recommend some non-prescription medication to alleviate the symptoms described.
38. Inquire about other ailments the consumer may have and medications she may be taking.
39. Recommend that she see her family physician since the symptoms described indicate a serious upper respiratory tract infection.
40. Recommend that because the woman exhibits symptoms of a common cold she should take ASA, drink plenty of fluids, and rest for the next two to three days.

PROBLEM 1.

SECTION D

You would be interested in which of the following information (Select AS MANY as you consider ESPECIALLY pertinent):

41. Is she being treated by a physician for any other ailment?
42. Is she taking any prescription medications?
43. When was the last time she saw her family physician.
44. Is she taking any non-prescription medication?
45. How long has she been taking her medications?

GO DIRECTLY TO SECTION F.

SECTION E

At this time you would (Choose ONLY ONE):

46. Recommend an alternate product,
47. Ask consumer to describe the symptoms.
48. Suggest that she see her family physician.
49. Suggest that "cold" is not serious enough to warrant treatment at this time and perhaps she should wait and see what develops.

SECTION F

At this time you would recommend that (Choose ONLY ONE):

50. Since the symptoms described indicate an upper respiratory tract infection of a serious nature she should see her family physician.
51. The consumer has the symptoms of a common cold and should take ASA and drink plenty of fluids and rest for the next two to three days.
52. Some non-prescription medication to alleviate the symptoms described is warranted.

SECTION G

At this time you would (Select AS MANY as you feel pertinent):

54. Inform the consumer of all possible side effects and adverse actions of her non-prescription medication.
55. Inform consumer about the proper dosage and the instructions on how to take the medication.
56. Suggest that if the cough persists, if a fever develops, or if any of the symptoms get worse, she should contact her physician.

COMPLETION OF SECTION G MARKS THE END OF THIS PROBLEM.

PROBLEM 1

SECTION H

At this time you would recommend
(Choose ONLY ONE):

- 57. Benylin^r with codeine for the cough and Triaminicin^r for the nasal congestion.
- 58. An oral product containing a sympathomimetic and an antihistamine.
- 59. Ornade DM^r liquid.
- 60. Throat lozenge.
- 61. A topical nasal decongestant such as Otrivin^r.
- 62. Dimetapp^r Elixir.
- 63. Suggest that she use a vaporizer in the evening.
- 64. Contac C^r.
- 65. Coricidin^r cold tablets.
- 66. Promatusssin^r Expectorant.
- 67. Robitussin^r.
- 68. Benylin Dietetic^r.
- 69. Buckely's Sugar Free^r.

SECTION I:

At this time you would recommend
(Choose ONLY ONE):

- 70. Benylin DM^r.
- 71. Dristan Tablets^r.
- 72. Ornade DM^r liquid.
- 73. Contac C^r.
- 74. Hall's Eucalyptus^r.
- 75. Coricidin^r Cold Tablets.
- 76. Robitussin^r.

SECTION I (Cont.)

- 77. Promatussin^r Expectorant.
- 78. Dimetapp^r Elixir.
- 79. Dristan^r nasal mist.

SECTION J

At this time you would (Choose ONLY ONE):

- 80. Ask consumer to describe symptoms.
- 81. Recommend a product.
- 82. Suggest that she see her family physician.

LATENT IMAGE RESPONSES

PROBLEM 1

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|---|---|
| 1. Consumer says she wants your assistance. Go to Section B. | 11. Returns the next day complaining that "cold" has not improved. Make another choice in this section. |
| 2. Consumer spends five minutes searching, waits until the two waiting customers leave with their prescriptions and then asks you to suggest a product for her cold. Go to Section B. | 12. I do. |
| 3. Go to Section I. | 13. Consumer is obviously agitated by the question and will not tell you her age. |
| 4. Consumer waits her turn and says, "What would you recommend for a cold?" Go to Section B. | 14. No. |
| 5. Go to Section I. | 15. Dry, hacking and non-productive. |
| 6. Consumer feels the cold does not warrant physician therapy and asks you to recommend a product. Go to Section I. | 16. Yes. |
| 7. This upsets one of the consumers who has been waiting for ten minutes for you to fill his prescription, he expresses his displeasure to you and after the discussion that follows the woman says she will wait. Go to Section B. | 17. Yes, difficulty in breathing through nose. |
| 8. Go to Section I. | 18. A slight post nasal drip. |
| 9. Go to Section C. | 19. Scratchy throat but no problem swallowing. |
| 10. Consumer feels the "cold" does not warrant physician therapy, and wants you to recommend product. Make another choice in this section. | 20. No. |
| | 21. No. |
| | 22. Neck not sore, does not know if glands are swollen. |
| | 23. No. |
| | 24. No. |
| | 25. No. |
| | 26. Noticed first signs of "cold" 36 hours ago. |
| | 27. No. |

PROBLEM 1

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- | | |
|---|--|
| <p>28. Trouble breathing through nose, kept awake longer than usual last night.</p> <hr/> | <p>46. Consumer upset that you would keep recommending products without asking about the symptoms. Go to Section J.</p> <hr/> |
| <p>29. Regular.</p> <hr/> | <p>47. Go to Section C.</p> <hr/> |
| <p>30. No.</p> <hr/> | <p>48. Since you have not made any inquiries about the symptoms of the ailment, consumer does not see how you could possibly ascertain that the "cold" warrants physician treatment. Wants you to handle her problem. Go to Section J.</p> <hr/> |
| <p>31. Yes, but does not see what that has to do with a cold.</p> <hr/> | <p>49. Consumer returns next day, says "cold" is not improving. Go to Section J.</p> <hr/> |
| <p>32. Good.</p> <hr/> | <p>50. Consumer returns that evening looking for a topical decongestant which her physician recommended for her nasal congestion due to the "cold". END OF PROBLEM.</p> <hr/> |
| <p>33. Yes.</p> <hr/> | <p>51. Consumer requests that you recommend something for the symptoms. If you now wish to recommend a non-prescription medication in addition to ASA, go to Section H. Otherwise, develop response 53.</p> <hr/> |
| <p>34. No.</p> <hr/> | <p>52. Go to Section H.</p> <hr/> |
| <p>35. No.</p> <hr/> | <p>53. The consumer expresses extreme displeasure at your reluctance to help her by suggesting something for the symptoms, and indicates she shall find a more cooperative pharmacist. END OF PROBLEM.</p> <hr/> |
| <p>36. No.</p> <hr/> | <p>54. Consumer is alarmed and leaves store without product. END OF PROBLEM.</p> <hr/> |
| <p>37. Go to Section H.</p> <hr/> | |
| <p>38. Go to Section D.</p> <hr/> | |
| <p>39. Consumer returns that evening looking for a topical decongestant which her physician recommended for her nasal congestion due to the "cold". END OF PROBLEM.</p> <hr/> | |
| <p>40. Consumer requests that you suggest something for the symptoms. Go to Section H.</p> <hr/> | |
| <p>41. Yes, high blood pressure and diabetes.</p> <hr/> | |
| <p>42. Yes, Orinase^r, Aldomet^r and Norinyl 1^r.</p> <hr/> | |
| <p>43. Four weeks ago for renewal of the Norinyl 1^r.</p> <hr/> | |
| <p>44. Yes, vitamins occasionally.</p> <hr/> | |
| <p>45. Two years for Orinase^r and Aldomet^r, 18 months for the Norinyl 1^r.</p> <hr/> | |

PROBLEM 1

-
55. Consumer thanks you for your help and advice and leaves the store with the medication you have recommended.
-
56. Consumer returns in five days to get her prescription for Aldomet^r refilled and at that time she informs you that she is feeling much better, her nasal congestion is gone and she has no post nasal drip, cough or sore throat.
-
57. The next day the consumer develops a headache, a general feeling of malaise. She goes to her physician who claims it is a direct result of the non-prescription medication you recommend. END OF PROBLEM.
-
58. The next day the consumer develops a headache and a general feeling of malaise. She goes to her family physician who attributes this to the non-prescription medication you recommended. END OF PROBLEM.
-
59. The next day the consumer develops a headache and a general feeling of malaise. She goes to her family physician who attributes this to the non-prescription medication you recommended. END OF PROBLEM.
-
60. The consumer would also like something for her nasal congestion. If you wish to recommend a second product, make another choice from this section, if not go to Section G.
-
61. Before consumer leaves she asks if there is anything she should know about this product. Go to Section G.
-
62. The next day the consumer notices an increased level of glucose in her urine. Phones her physician who says it may be due to the non-prescription medication you have recommended. END OF PROBLEM.
-
63. Consumer feels she needs something for daytime relief of her congestion, and wants you to recommend something else. Make another choice from this section.
-
64. The next day the consumer develops a headache and a general feeling of malaise. She goes to her family physician who attributes this to the non-prescription medication you have recommended. END OF PROBLEM.
-
65. The next day the consumer develops a headache and a general feeling of malaise. She goes to her family physician who attributes this to the non-prescription medication recommended. END OF PROBLEM.
-
66. The next day the consumer notices an increased level of glucose in her urine. She phones her physician who says it may be due to the non-prescription medication you recommended. END OF PROBLEM.
-

PROBLEM 1

67. The next day the consumer notices an increased level of glucose in her urine. She phones her physician who says it may be due to the non-prescription medication you recommended. END OF PROBLEM.

68. Go to Section G.

69. Go to Section G.

70. Consumer goes and finds the product on the shelf, she reads the directions. Since you have finished with your previous customers she returns to you and says that product is unsuitable. She asks you to recommend something else. Go to Section E.

71. Consumer finds the product on the shelf and reads the directions. Since you have finished with your previous customers she returns to you and says that product is unsuitable. She asks you to recommend something else. Go to Section E.

72. Consumer finds the product on the shelf and reads the directions. Since you have finished with your previous customers she returns to you and says that product is unsuitable. She asks you to recommend something else. Go to Section E.

73. Consumer finds the product on the shelf and reads the directions. Since you have finished with your previous customers she returns to you and says that product is unsuitable. She asks you to recommend something else. Go to Section E.

74. Consumer finds the product on the shelf and reads the directions. Since you have finished with your previous customers she returns to you and says that product is unsuitable. She asks you to recommend something else. Go to Section E.

75. Consumer finds the product on the shelf and reads the directions. Since you have finished with your previous customers she returns to you and says that product is unsuitable. She asks you to recommend something else. Go to Section E.

76. Consumer finds the product on the shelf and reads the directions. Since you have finished with your previous customers she returns to you and says that product is unsuitable. She asks you to recommend something else. Go to Section E.

77. Consumer finds the product on the shelf and reads the directions. Since you have finished with your previous customers she returns to you and says that product is unsuitable. She asks you to recommend something else. Go to Section E.

PROBLEM 1

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78. Consumer finds the product on the shelf and reads the directions. Since you have finished with your previous customers she returns to you and says that product is unsuitable. She asks you to recommend something else. Go to Section E.
-
79. Consumer finds the product on the shelf and reads the directions. Since you have finished with your previous customers she returns to you and says that product is unsuitable. She asks you to recommend something else. Go to Section E.
-
80. Go to Section C.
-
81. Go to Section H.
-
82. Consumer feels that "cold" does not warrant physician treatment, wants you to recommend a product. Make another choice in this section.
-

PROBLEM 2

OPENING SCENE

You are a community pharmacist working in a medium size store of a large national chain. The dispensary in this store is slightly elevated and located at the back of a bright and well laid out main floor. The dispensary is of adequate size and is well stocked with references and all the necessary auxiliary equipment.

On this particular Monday you are the only pharmacist in the dispensary and there are two employees working "out front". It is 10 a.m. and you are fairly busy. There are a number of phoned-in prescriptions yet to be done and there are two individuals waiting for their prescriptions which you are presently working on. A young man enters the store and heads for the dispensary, stops in front of you and asks the following question, "What have you got for a cold?"

SECTION A

Considering the circumstances just described you would NOW (Choose ONLY ONE):

1. Ask one of the "out front" employees to help him.
2. Recommend that he select a product from the "Cough and Cold" section.
3. Recommend a product which he would recognize because it is advertised on national television.
4. Ask him to be seated and you will be with him shortly.
5. Since all non-prescription medications designed to relieve the symptoms of the common cold are the same, recommend one that you have found beneficial in the past.
6. Recommend that he contact his family physician.

SECTION A contd.

7. Drop what you are doing and walk with him to the "Cough and Cold" section.

SECTION B

8. Recommend a product that you have been recommending for years.
9. Obtain a description of the ailment.
10. Recommend that he see his family physician.
11. Suggest that he wait a few days to see if the "cold" gets better, if not he should contact his family physician.

SECTION C

You would be interested in asking about which of the following (Select AS MANY as you consider ESPECIALLY pertinent):

12. Who has the cold.
13. Individual's age.
14. Fever.

SECTION C CONTINUED ON NEXT PAGE

PROBLEM 2

SECTION C contd.

15. Any cough.
16. Description of any cough.
17. Nasal discharge.
18. Nasal congestion.
19. Post nasal drip.
20. Sore throat.
21. Muscle aches and pains.
22. Headache.
23. Swollen glands or sore neck.
24. Nausea and vomiting.
25. Ear ache.
26. Night sweats.
27. Duration of the symptoms.
28. Shortness of breath.
29. Trouble sleeping.
30. Bowel movements.
31. Allergies.
32. If there are any small children around house.
33. Appetite.
34. Does he sleep with a window open.
35. Are there other members of the family afflicted with a "cold".
36. Does he smoke cigarettes.
37. Is he experiencing any indigestion.

At this time you would (Choose ONLY ONE):

38. Recommend some non-prescription medication to alleviate the symptoms described.

SECTION C contd.

39. Inquire about other ailments he may have and medications he may be taking.
40. Recommend that he see his family physician since the symptoms described indicate a serious upper respiratory tract infection.
41. Recommend that because he exhibits symptoms of a common cold he should take ASA, drink plenty of fluids, and rest for the next five to seven days.
42. Recommend he go to "out-patients".

SECTION D

You would be interested in which of the following information (Select AS MANY as you consider ESPECIALLY pertinent):

43. Is he being treated by a physician for any other ailment.
44. Is he taking any prescription medications.
45. When was the last time he saw a physician.
46. Is he taking any non-prescription medication.

GO DIRECTLY TO SECTION E.

SECTION E

At this time you would recommend that (Choose ONLY ONE):

47. Since the symptoms described indicate an upper respiratory tract infection of a serious nature he should see his family physician.
48. The consumer has the symptoms of a common cold and should take ASA and drink plenty of fluids and rest for next two to three days.

SECTION E CONTINUED ON NEXT PAGE

PROBLEM 2

SECTION E contd.

- 49. Some non-prescription medication to alleviate the symptoms described is warranted.
- 51. Suggest he go to "out-patients".
- 52. Emphasize the importance of seeing a physician. If possible, suggest the name of a physician he could contact or arrange for him to contact a physician.
- 53. Recommend ASA and a non-prescription product for the symptoms and suggest he see a physician.

SECTION F

At this time you would recommend (Choose ONLY ONE):

- 54. Benylin^r with codeine for the cough and Triaminicin^r for the nasal congestion.
- 55. An oral product containing a sympathomimetic and an antihistamine.
- 56. Orande DM^r liquid.
- 57. Throat lozenge.
- 58. A topical nasal decongestant such as Otrivin^r.
- 59. Dimetapp^r Elixir.
- 60. Suggest that he use a vapourizer in the evening.
- 61. Contac C^r.
- 62. Coricidin^r cold tablets.
- 63. Promatussin^r Expectorant.
- 64. Robitussin^r.

SECTION G

At this time you would (Choose ONLY ONE):

- 65. Ask consumer to describe symptoms.
- 66. Recommend a product.
- 67. Suggest that he go to "out-patients".

LATENT IMAGE RESPONSES

PROBLEM 2

- | | |
|---|---|
| <hr/> <p>1. Consumer says he wants your assistance. Go to Section B.</p> <hr/> | <hr/> <p>12. I do.</p> <hr/> |
| <hr/> <p>2. Consumer spends five minutes searching, waits until the two waiting customers leave with their prescriptions and then asks you to suggest a product for a cold. Go to Section B.</p> <hr/> | <hr/> <p>13. 19.</p> <hr/> |
| <hr/> <p>3. Go to Section F.</p> <hr/> | <hr/> <p>14. Have not taken it, but has felt "hot" for two days.</p> <hr/> |
| <hr/> <p>4. Consumer waits his turn and says, "What would you recommend for a cold?" Go to Section B.</p> <hr/> | <hr/> <p>15. Yes.</p> <hr/> |
| <hr/> <p>5. Go to Section F.</p> <hr/> | <hr/> <p>16. Quite fierce at times and bring-up congestion.</p> <hr/> |
| <hr/> <p>6. Consumer does not have a family physician in this city. Go to Section G.</p> <hr/> | <hr/> <p>17. Yes.</p> <hr/> |
| <hr/> <p>7. This upsets one of the consumers who has been waiting for ten minutes for you to fill his prescription, he expresses his displeasure to you and, after the discussion that follows, the young man says he will wait. Go to Section B.</p> <hr/> | <hr/> <p>18. Yes, difficulty in breathing through nose.</p> <hr/> |
| <hr/> <p>8. Go to Section F.</p> <hr/> | <hr/> <p>19. A slight post nasal drip.</p> <hr/> |
| <hr/> <p>9. Go to Section C.</p> <hr/> | <hr/> <p>20. Yes, hard to swallow.</p> <hr/> |
| <hr/> <p>10. Wants you to help. Make another choice in this section.</p> <hr/> | <hr/> <p>21. Feels tired all over, no energy.</p> <hr/> |
| <hr/> <p>11. Returns the next day complaining that his "cold" has not improved. Make another choice in this section.</p> <hr/> | <hr/> <p>22. No.</p> <hr/> |
| | <hr/> <p>23. Neck not sore, does not know if glands are swollen.</p> <hr/> |
| | <hr/> <p>24. No.</p> <hr/> |
| | <hr/> <p>25. No.</p> <hr/> |
| | <hr/> <p>26. Did have the "chills" last night.</p> <hr/> |
| | <hr/> <p>27. Noticed first signs of "cold" 5 or 6 days ago.</p> <hr/> |
| | <hr/> <p>28. No.</p> <hr/> |
| | <hr/> <p>29. Trouble breathing through nose, kept awake longer than usual last night.</p> <hr/> |
| | <hr/> <p>30. Regular.</p> <hr/> |

PROBLEM 2

31. No.

32. Not living at home, he is ~~not~~ hitchhiking across Canada.

33. Good.

34. Slept outdoors in a tent for last two weeks.

35. No.

36. Yes..

37. No..

38. Go to Section F.

39. Go to Section D.

40. Has no doctor in this city. Make another choice from this section.

41. Consumer requests that you suggest something for his symptoms. Go to Section F.

42. Consumer thanks you for your advice and leaves the store. END OF PROBLEM.

43. No.

44. No.

45. Six months ago.

46. No.

47. Says he does not know a physician in this town. Make another selection from this section.

48. Consumer requests that you recommend something for his symptoms. If you NOW wish to recommend a non-prescription medication in addition to ASA, go to Section F. Otherwise, develop response 50.

49. Go to Section F.

50. The consumer expresses extreme displeasure at your reluctance to help him by suggesting something for his symptoms and indicates he shall find a more cooperative pharmacist. END OF PROBLEM.

51. Consumer thanks you for your advice and leaves the store. Returns in 3 hours with prescriptions for Penbritin^r 500 mg. and Robitussin^r. END OF PROBLEM.

52. Consumer thanks you for your help and leaves the store. Returns in 3 hours with prescriptions for Penbritin^r 500 mg. and Robitus-sin^r. END OF PROBLEM.

53. Go to Section F.

54. He purchases product and leaves. The next day the young man returns with a prescription for Penbritin^r 500 mg. and Robitus-sin^r. END OF PROBLEM.

55. He purchases product and leaves. The next day the young man returns with a prescription for Penbritin^r 500 mg. and Robitussin^r. END OF PROBLEM.

56. He purchases product and leaves. The next day the young man returns with a prescription for Penbritin^r 500 mg. and Robitussin^r. END OF PROBLEM.

PROBLEM 2

57. He purchases product and leaves. The next day the young man returns with a prescription for Penbritin^r 500 mg. and Robitussin^r. END OF PROBLEM.

58. He purchases product and leaves. The next day the young man returns with a prescription for Penbritin^r 500 mg. and Robitussin^r. END OF PROBLEM.

59. He purchases product and leaves. The next day the young man returns with a prescription for Penbritin^r 500 mg. and Robitussin^r. END OF PROBLEM.

60. Since he is "tenting" he cannot use a vapourizer. Could you suggest something else? Make another choice from this section.

61. He purchases product and leaves. The next day the young man returns with a prescription for Penbritin^r 500 mg. and Robitussin^r. END OF PROBLEM.

62. He purchases product and leaves. The next day the young man returns with a prescription for Penbritin^r 500 mg. and Robitussin^r. END OF PROBLEM.

63. He purchases product and leaves. The next day the young man returns with a prescription for Penbritin^r 500 mg. and Robitussin^r. END OF PROBLEM.

64. He purchases product and leaves. The next day the young man returns with a prescription for Penbritin^r 500 mg. END OF PROBLEM.

65. Go to Section C.

66. Go to Section F.

67. He is not too willing to take this advice. Make another selection from this section.

PROBLEM 3

OPENING SCENE

You are a community pharmacist employed at MacLean's pharmacy. The store is located in a middle class neighbourhood and its owner, Mr. MacLean, has been serving this area for 23 years. Mr. MacLean is thinking of retiring and would like you to buy the business. He has built up a good relationship with his customers and he is often called upon for his advice on health matters. You both faithfully maintain a patient record system and Mr. MacLean is very proud of the service that he provides his customers.

The store is open from 9a.m. to 9p.m. Monday to Friday and 9a.m. to 6p.m. Saturday. It is Wednesday night and you and one out front clerk are working. It is a "slow" night and at present you are caught up on your prescription orders. There are three consumers browsing in various areas of the store. One of the consumers, a young man, asks to speak to Mr. MacLean. You explain that it is Mr. MacLean's night off and you offer your assistance. The young man then asks, "What is the strongest pain reliever I may purchase without a prescription?"

SECTION A

Considering the circumstances just described you would NOW (choose ONLY ONE):

1. Recommend a strong non-prescription pain reliever.
2. Direct him to the appropriate section out front.
3. Suggest he see a physician.
4. Suggest that he go to "out-patients".
5. Ask him for more information.
6. Ask the out front clerk to help him.
7. Suggest that if the pain does not disappear in a few days to see a physician but at present it does not warrant treatment with a non-prescription product.

SECTION B

You would be interested in which of the following information. (Choose as MANY as you consider ESPECIALLY pertinent):

8. Is the individual being treated by a physician.
9. When was the last time he saw a physician.
10. Does he take any prescription drugs.
11. Does he take any non-prescription drugs.

PROCEED DIRECTLY TO SECTION C

PROBLEM 3

SECTION C

At this time you would (Choose ONLY ONE):

12. Recommend that he take a non-prescription pain reliever.
13. Recommend that he go to "out-patients" if he is unable to reach his physician.
14. Suggest that in your opinion there is really no need to take a pain reliever.
15. Look up Fred Archibald in the Patient Record System.
16. Recommend a non-prescription product and suggest consulting a physician if not relieved.

UNLESS OTHERWISE DIRECTED, GO TO SECTION G.

SECTION D

At this time you would recommend (Choose ONLY ONE):

17. Asprin^r..
18. Aspergum^r.
19. Tylenol^r.
20. Bufferin^r.
21. Bromo Seltzer^r.
22. Enthrophon^r.
23. Frosst 217^r.
24. Frosst 222^r.
25. Anacin with Codeine^r.
26. Tempra^r.
27. Excedrin^r.
28. Tylenol #1^r.

SECTION E

You would at this time (Choose ONLY ONE):

29. Recommend a non-prescription product.
30. Recommend that he see a physician.
31. Suggest that he go to "out-patients".
32. Ask for more information.
33. Suggest that in your opinion there is no need to take a non-prescription medication.
34. Recommend a non-prescription product and suggest consulting a physician if not relieved.

SECTION F

You would be interested in asking about which of the following (Select as MANY as you consider ESPECIALLY important):

35. Who is it for.
36. What type of pain.
37. Duration.
38. Location.
39. Age.
40. Fever.
41. Nausea and vomiting.
42. Sore throat.
43. Muscle aches and pains.
44. Does he smoke.
45. Allergies.

SECTION F CONTINUED ON NEXT PAGE

PROBLEM 3

SECTION F (Cont.)

46. General all around health.
47. How often does he get these pains.
48. What does he usually take for pain.
49. How is his eyesight.

At this time you would (Choose ONLY ONE):

50. Recommend a non-prescription medication to alleviate the pain.
51. Inquire about other ailments he may be taking medications for.
52. Recommend that he see a physician.
53. Suggest that the symptoms described do not warrant therapy with a non-prescription medication and therefore, you will not recommend a product.
54. Suggest that if he cannot reach a physician that he should go the "out-patients" department of the nearest hospital.
55. Recommend a non-prescription medication and suggest consulting a physician if not relieved.

SECTION G

At this time you would (Choose ONLY ONE):

56. Recommend a non-prescription medication.
57. Suggest that the individual see a physician.
58. Recommend that no non-prescription medication be taken.
59. Suggest that the individual go to the "out-patients" department of nearest hospital.
60. Recommend a non-prescription medication and suggest consulting a physician if not relieved.

LATENT IMAGE RESPONSES

PROBLEM 3

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| <hr/> <p>1. Go to Section D.</p> <hr/> <p>2. He says that he has searched there and is confused as to which is the strongest. He wants you to recommend something. Go to Section E.</p> <hr/> <p>3. At this hour of the night he wants you to recommend something. Go to Section E.</p> <hr/> <p>4. He feels this is a bit drastic and wants you to recommend something. Go to Section E.</p> <hr/> <p>5. Go to Section F.</p> <hr/> <p>6. This upsets him and he wants you to assist him. Go to Section E.</p> <hr/> <p>7. He says that he would like you to recommend something tonight. Go to Section E.</p> <hr/> <p>8. Yes, but does not know for what condition.</p> <hr/> <p>9. Do not know exactly but he does see one occasionally.</p> <hr/> <p>10. Yes, some white pills but does not know what kind. However, his father-in-law does get his prescriptions filled at MacLean's, will that help?</p> <hr/> <p>11. Yes, he believes strongly in vitamins and takes some daily.</p> <hr/> | <hr/> <p>12. Go to Section D.</p> <hr/> <p>13. Customer leaves store. END OF PROBLEM.</p> <hr/> <p>14. Customer leaves store. END OF PROBLEM.</p> <hr/> <p>15. He has been receiving Zylprim since 1969. He does not take any other medication. No allergies.</p> <hr/> <p>16. Go to Section D.</p> <hr/> <p>17. He purchases product and leaves store. END OF PROBLEM.</p> <hr/> <p>18. He purchases product and leaves the store. END OF PROBLEM.</p> <hr/> <p>19. He purchases product and leaves the store. END OF PROBLEM.</p> <hr/> <p>20. He purchases product and leaves the store. END OF PROBLEM.</p> <hr/> <p>21. He purchases product and leaves the store. END OF PROBLEM.</p> <hr/> <p>22. He purchases product and leaves the store. END OF PROBLEM.</p> <hr/> <p>23. He purchases product and leaves the store. END OF PROBLEM.</p> <hr/> <p>24. He purchases product and leaves the store. END OF PROBLEM.</p> <hr/> <p>25. He purchases product and leaves the store. END OF PROBLEM.</p> <hr/> <p>26. He purchases product and leaves the store. END OF PROBLEM.</p> <hr/> |
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PROBLEM 3

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| 27. He purchases product and leaves the store. END OF PROBLEM. | 47. Says that he gets headaches occasionally but this one has lasted all day and he needs to take something. |
| 28. He purchases product and leaves the store. END OF PROBLEM. | 48. Nothing. |
| 29. Go to Section D. | 49. Good. |
| 30. Consumer feels that he would be unable to get in touch with one this late at night. Make another choice from this Section. | 50. Go to Section D. |
| 31. Consumer leaves the store. END OF PROBLEM. | 51. Go to Section B. |
| 32. Go to Section F. | 52. He leaves the store. END OF PROBLEM. |
| 33. Consumer leaves the store. END OF PROBLEM. | 53. He leaves the store. END OF PROBLEM. |
| 34. Go to Section D. | 54. He leaves the store. END OF PROBLEM. |
| 35. His father-in-law, Fred Archibald. | 55. Go to Section D. |
| 36. Throbbing headache. | 56. Go to Section D. |
| 37. All day. | 57. Consumer thanks you and leaves store. END OF PROBLEM. |
| 38. Mostly in the forehead. | 58. Consumer thanks you and leaves store. END OF PROBLEM. |
| 39. Let's see, he has just retired so maybe 65. | 59. Consumer thanks you and leaves store. END OF PROBLEM. |
| 40. No. | 60. Go to Section D. |
| 41. No. | |
| 42. No. | |
| 43. No. | |
| 44. No. | |
| 45. None, that I am aware of. | |
| 46. He is healthier than I am. | |

LEAF 187 OMITTED IN PAGE NUMBERING.

PROBLEM 4

OPENING SCENE

You are a community pharmacist employed at Mid-City Drugs. The store is located in an area composed of mostly working class, recent immigrant families. This particular store has been operated by the same pharmacist for nearly thirty years. You are a recent graduate and you are trying to upgrade the quality of pharmaceutical services provided by this store. You have added substantially to the dispensary library and you have persuaded the owner to purchase a Patient Record System. You both faithfully keep the records up to date although your boss is skeptical of their usefulness. The system has received a mixed reaction from clientele.

The store is open 9 a.m. to 9 p.m., Monday to Saturday. It is 8 p.m. on a Saturday evening and you are the only pharmacist working in the store. There is one "out front" clerk working the cash and dusting shelves. You have finished all your prescription orders. Mrs. Mikulik, a woman in her mid thirties, whom you recognize as a patron, approaches you. "Could you recommend something for pain?", she asks.

SECTION A

Considering the circumstances just described, you would now (Choose ONLY ONE):

1. Recommend a non-prescription pain reliever.
2. Suggest that she see a physician.
3. Ask the "out front" clerk to help.
4. Suggest that she choose from the products in the appropriate section of the store.
5. Suggest that she go to "out-patients".
6. Ask for more information.
7. Suggest that it is not wise to self-medicate for pain. If the pain does not disappear in a few days then she should consult with her physician.

SECTION B

You would be interested in which of the following information. (Choose AS MANY as you consider ESPECIALLY PERTINENT):

8. When was the last time she saw a physician.
9. Is she currently being treated by a physician for any condition.
10. Is she taking any prescription medication.
11. Does she take any non-prescription medication.

PROCEED DIRECTLY TO SECTION D.

SECTION C

At this time you would NOW (Choose only ONE):

12. Suggest that she go to "out-patients".
13. Recommend a product.

PROBLEM 4

SECTION C (cont.)

14. Ask for information.
15. Suggest that she not self-medicate and if the pain persists, she should see a physician.
16. Suggest she choose a product from the appropriate section out front.

SECTION D

At this time you would NOW (Choose ONLY ONE):

17. Recommend a non-prescription product.
18. Suggest that she should continue taking Aspirin^r and see a physician next week.
19. Suggest that she go to "out-patients".
20. Suggest that she see a physician soon about the symptoms.
21. Explain that symptoms are not serious enough to warrant self-medication with a non-prescription product.
22. Look up Mrs. Mikulik in the patient record system.

UNLESS OTHERWISE DIRECTED GO DIRECTLY TO SECTION E.

SECTION E

At this time you would (Choose ONLY ONE):

23. Suggest that she make an appointment to see a physician about the pain.
24. Recommend a non-prescription pain reliever.

SECTION E (cont.)

25. Suggest that she go to "out-patients".
26. Suggest that the symptoms described are not serious enough to warrant self-medicating.
27. Suggest doubling the dose of the Aspirin^r and consulting her physician next week.

SECTION F.

At this time you would (Choose ONLY ONE):

28. Suggest that she see a physician.
29. Ask for more information.
30. Recommend a non-prescription product.
31. Suggest that she should not self-medicate, and if the pain is no better on Monday, she should see a physician.

SECTION G

At this time you would now recommend (Choose ONLY ONE):

32. Entrophen^r.
33. Aspirin^r.
34. Frosst 222^r.
35. Excedrin^r.
36. Alka Seltzer^r.
37. Anacin^r.
38. Anacin with Codeine^r.
39. C-2's^r.
40. Frosst 217 Strong^r.
41. Aspergum^r.
42. Ecotrin^r.
43. Tempra^r.
44. Tylenol^r.
45. Tylenol #1^r.

PROBLEM 4

SECTION H

You would be interested in asking about which of the following (Select AS MANY as you consider ESPECIALLY IMPORTANT):

46. Who is it for.
47. Description of pain.
48. Duration.
49. Location.
50. Age.
51. Fever.
52. Nausea and vomiting.
53. Muscle aches and pains.
54. Does she smoke.
55. Allergies.
56. Aside from the pain, how do you feel.
57. How often do you get these pains.

PROCEED DIRECTLY TO SECTION B.

LATENT IMAGE RESPONSES

PROBLEM 4

- | | |
|---|---|
| 1. Go to Section G. | 14. Go to Section H. |
| 2. At this hour of night she feels she would be unable to reach her physician. Go to Section C. | 15. She says the pain is really quite annoying. Can't you suggest something. Make another choice from this section. |
| 3. Mrs. Mikulik would like you to assist her. Go to Section C. | 16. Has searched and is confused. Could you recommend something. Go to Section F. |
| 4. "She has looked at those products and could you recommend a strong one." Go to Section C. | 17. Go to Section G. |
| 5. "Is that really necessary? Could you not recommend something?" Go to Section F. | 18. She thanks you and leaves the store. END OF PROBLEM. |
| 6. Go to Section H. | 19. She thanks you and leaves the store. END OF PROBLEM. |
| 7. "Could you not recommend something to relieve the pain over the week-end?" Go to Section C. | 20. She thanks you and leaves the store. END OF PROBLEM. |
| 8. Six months ago for renewal of her birth control prescription. | 21. She leaves the store. END OF PROBLEM. |
| 9. No. | 22. She has been taking Ortho 1/80 ^r since Dec. 1973. No other prescriptions noted, no allergies. |
| 10. Only her birth control pills. | 23. She thanks you for your advice and leaves. END OF PROBLEM. |
| 11. She has been taking 3 or 4 Asprin ^r tablets/day for the pain for about 10 days. They do not appear to be helping very much. She occasionally takes Exlax ^r pills. | 24. Go to Section G. |
| 12. She feels this is a bit drastic. Make another selection from this section. | 25. She thanks you for your advice and leaves the store. END OF PROBLEM. |
| 13. Go to Section G. | 26. She thanks you for your advice and leaves. END OF PROBLEM. |
| | 27. She thanks you for your advice and leaves. END OF PROBLEM. |

PROBLEM 4

-
28. On Saturday night she feels she would be unable to reach him, could you not recommend something. Make another selection from this section.
-
29. Go to Section H.
-
30. Go to Section G.
-
31. She leaves the store. END OF PROBLEM.
-
32. She purchases product and leaves. END OF PROBLEM.
-
33. She purchases product and leaves. END OF PROBLEM.
-
34. She purchases product and leaves. END OF PROBLEM.
-
35. She purchases product and leaves. END OF PROBLEM.
-
36. She purchases product and leaves. END OF PROBLEM.
-
37. She purchases product and leaves. END OF PROBLEM.
-
38. She purchases product and leaves. END OF PROBLEM.
-
39. She purchases product and leaves. END OF PROBLEM.
-
40. She purchases product and leaves. END OF PROBLEM.
-
41. She purchases product and leaves. END OF PROBLEM.
-
42. She purchases product and leaves. END OF PROBLEM.
-
43. She purchases product and leaves. END OF PROBLEM.
-
44. She pruchases product and leaves. END OF PROBLEM.
-
45. She purchases product and leaves. END OF PROBLEM.
-
46. Herself.
-
47. Persistent.
-
48. Has had these pains off and on for some months.
-
49. Wrists and joints of hands.
-
50. 37.
-
51. No.
-
52. No.
-
53. Feels quite stiff for the first little while in the morning.
-
54. Yes.
-
55. None.
-
56. Alright I guess, I find that I get tired in the mid afternoon and must rest.
-
57. Lately it seems the pain is always there.
-

Fig. 3 SIMULATION ONE
Possible Paths to Problem Solution

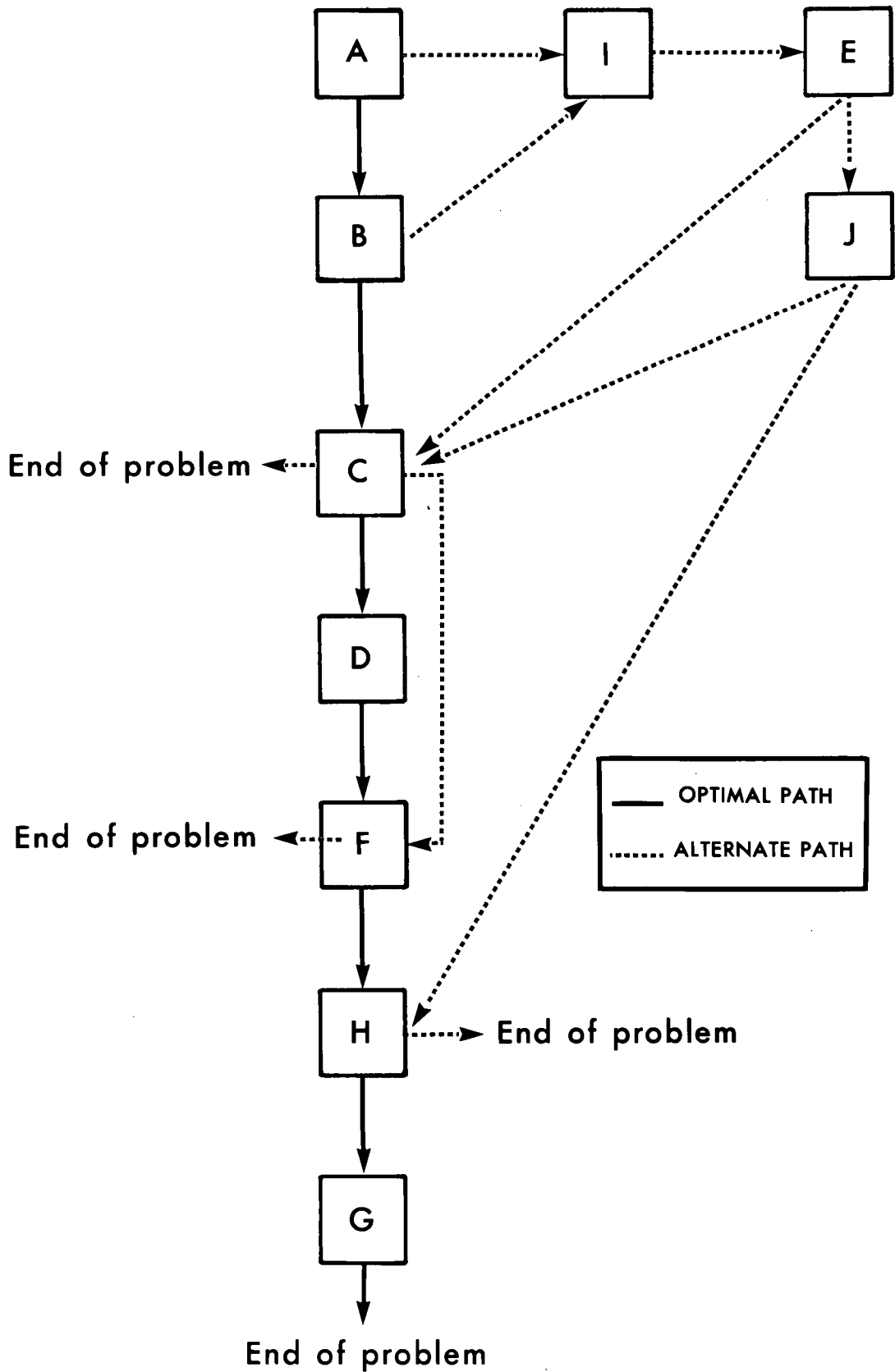


Fig. 4 SIMULATION TWO
Possible Paths to Problem Solution

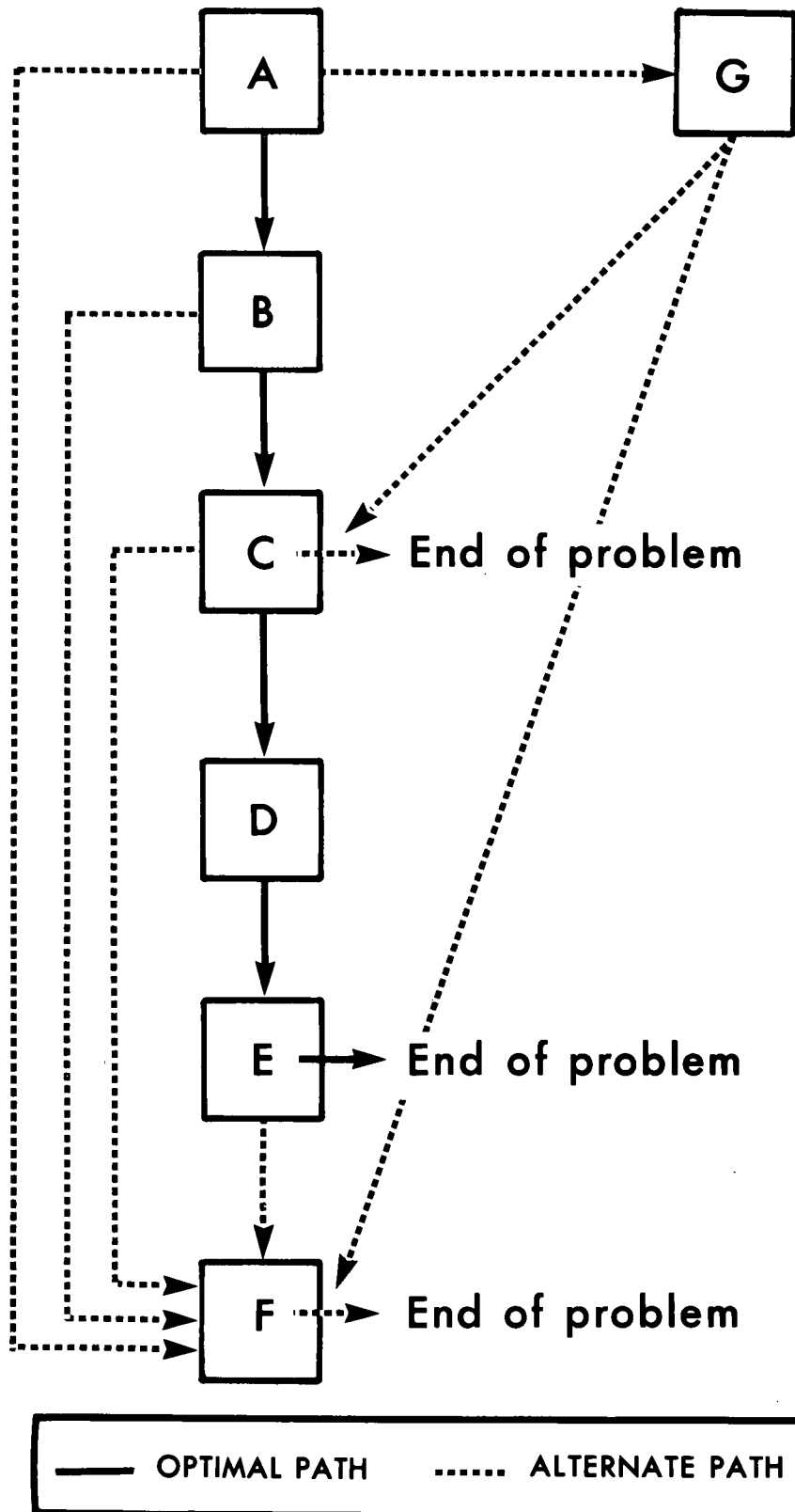


Fig. 5. SIMULATION THREE

Possible Paths to Problem Solution

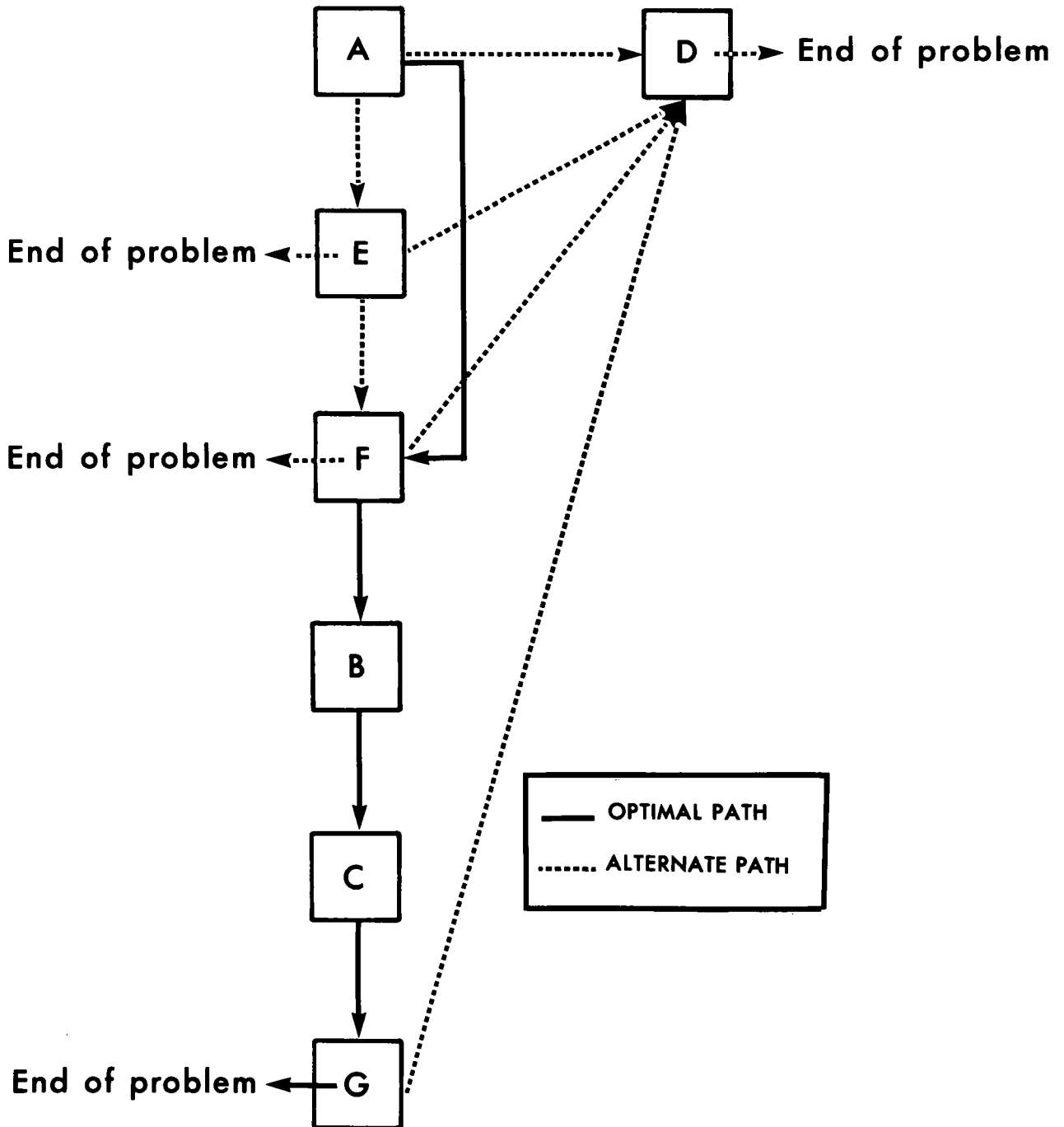


Fig. 6. SIMULATION FOUR
Possible Paths to Problem Solution

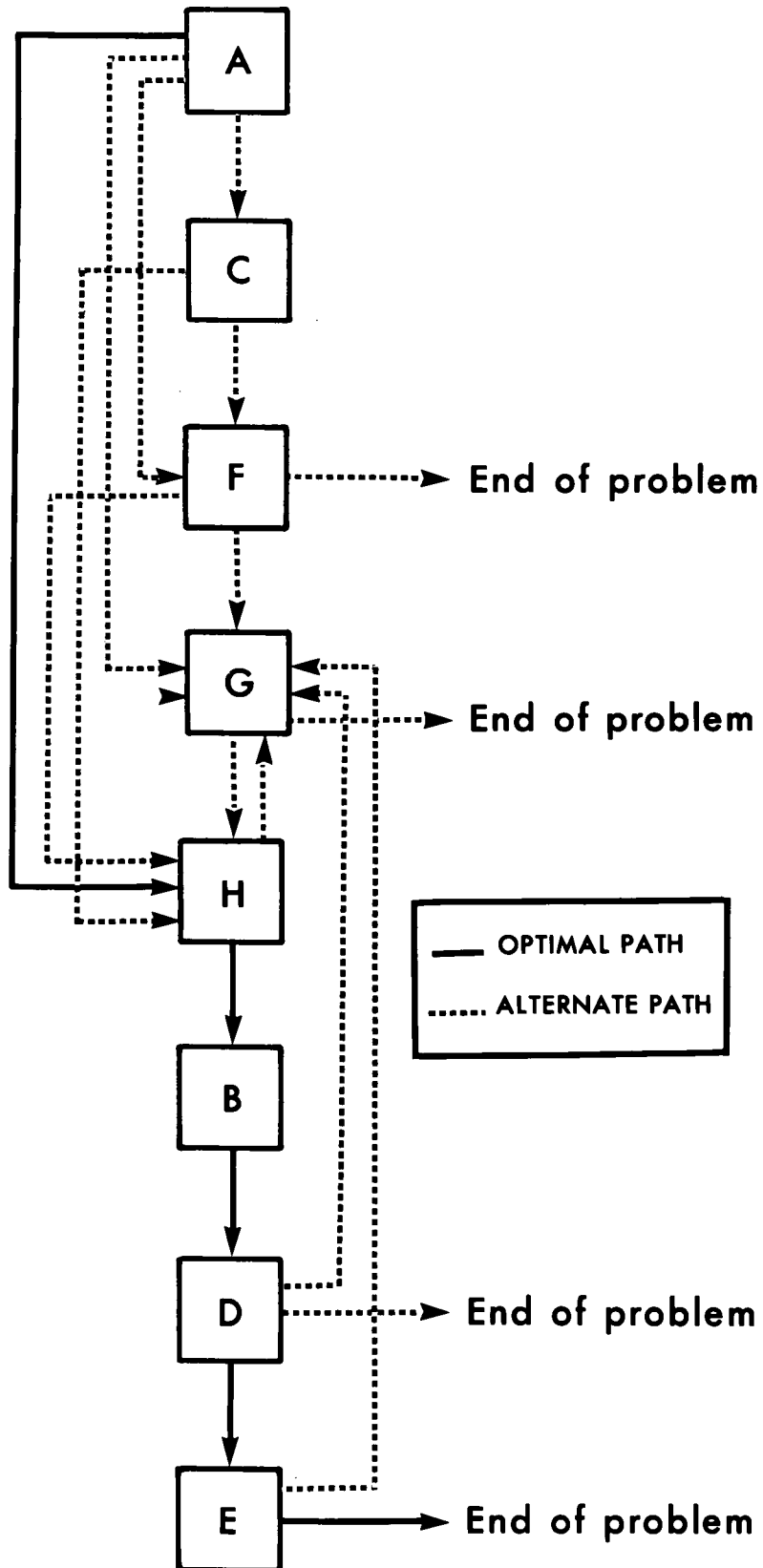


TABLE XIV

INTERCORRELATIONS OF THE TEN JUDGES' RATINGS
OF THE 267 OPTIONS IN SIMULATIONS ONE TO FOUR

Judge	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
1		.7859	.8305	.7754	.7632	.7357	.8206	.6907	.6788	.7879
2			.7000	.7381	.7841	.6982	.7646	.6566	.6855	.7930
3				.7293	.7238	.7063	.7518	.6380	.6910	.7112
4					.8037	.6820	.8309	.6783	.7665	.7125
5						.6401	.7983	.7073	.7560	.7748
6							.7178	.6754	.7159	.7742
7								.6924	.7236	.7657
8									.7061	.6810
9										.7008
10										
Mean correlation = 0.7313										

APPENDIX D: PRE AND POST TESTS FOR FACTUAL KNOWLEDGE

Page

1. Cold Medication Pre-Test
2. Cold Medication Post-Test
3. Analgesics Pre-Test
4. Analgesics Post-Test

Advising Patients on Non Prescription Medications

Cold Medications

PRE TEST

True/False: Circle either T or F to indicate the answer that you believe most appropriate.

1. A patient on a regimen of propylthiouracil can safely take Eltor capsules to relieve his cold symptoms. T F
2. Fever is a symptom that usually accompanies the common cold. T F
3. Allergic rhinitis and respiratory infections due to Strep. pyogenes may produce symptoms resembling a common cold. T F
4. Topical nasal decongestants take longer to be absorbed into the systemic circulation and therefore have a slower response than systemic nasal decongestants. T F
5. Rebound congestion is one possible adverse effect of systemic nasal decongestants. T F
6. Non-prescription preparations intended for topical application containing naphazoline should not be used in children and infants under 6 years old. T F

Circle the ONE BEST answer.

1. Which of the following is NOT a characteristic of the common cold?
 - (a) The incidence is higher in males than females.
 - (b) The incidence is higher in children than adults.
 - (c) The incidence is higher in females than males.
 - (d) The incidence is higher in winter than summer.
 - (e) The "cold" accounts for approximately 40% of the lost time from work.
2. Which of the following is usually NOT a symptom of the common cold in adults?
 - (a) nasal obstruction
 - (b) nasal discharge
 - (c) fever
 - (d) sore throat
 - (e) sneezing
3. Which of the following is NOT a general measure to recommend each time to relieve the symptoms of the common cold?
 - (a) bed rest
 - (b) humidification
 - (c) increase fluid intake
 - (d) A.S.A. or Acetaminophen
 - (e) Antihistamines and/or sympathomimetic amines

4. The role of sympathomimetics in the treatment of the symptoms of a cold is:
 - (a) to stimulate the adrenergic receptors to cause bronchoconstriction to ease breathing
 - (b) to increase the flow of blood to the nasal mucosa
 - (c) to dilate the blood vessels in the nasal mucosa
 - (d) to stimulate the adrenergic receptors of the vascular smooth muscle and thus reduce the blood flow to the nasal mucosa
 - (e) all of the above
5. Which of the following nasal decongestants may be administered topically and systemically:
 - (a) oxymetazoline
 - (b) phenylephrine
 - (c) propylephrine
 - (d) xylometazoline
 - (e) pseudoephedrine
6. A consumer has asked for assistance in selecting a non-prescription cold product. He has the following symptoms; sore throat, post nasal drip, nasal congestion, a fever and sore muscles. He has a productive cough producing greenish phlegm. He says the symptoms were first noticed about seven days ago. The individual is not being treated by a physician, takes no prescription nor non-prescription drugs and has no allergies.

Which of the following would be the best advice to this customer?

 - (a) recommend an oral cold product
 - (b) recommend a topical nasal decongestant
 - (c) suggest that he see a physician as soon as possible
 - (d) recommend non-prescription products to relieve the cough and congestion
 - (e) both c and d
7. A consumer has asked for assistance in selecting a non-prescription cold product. She has the following symptoms; sore throat, nasal congestion, post nasal drip and a slight cough which is non-productive in nature. She has no fever. The symptoms have developed over the last two days. She is a diabetic and has been taking Diabinese^R for several years. She says she takes the occasional laxative. She has no allergies.

Which of the following would be the best advice for this individual?

 - (a) recommend an oral cold product
 - (b) recommend a topical nasal decongestant
 - (c) suggest that she see a physician as soon as possible
 - (d) recommend an oral cold product for the congestion and an antitussive cough preparation
 - (e) both c and d
8. A consumer asks you for assistance concerning what he believes to be a "cold". He says he is bothered by nasal congestion, a mild sore throat and a post nasal drip which is keeping him awake at night. The symptoms developed in the last 24 hours. He says he has no fever, no cough and generally feels good. He takes no prescription medication.

He has no drug allergies.

Which of the following would be the best advice for this individual?

- (a) recommend an oral cold product containing a nasal decongestant
- (b) recommend a topical nasal decongestant
- (c) recommend he see a physician as soon as possible
- (d) all of the above
- (e) either a or b

9. Mrs. Smith wants your assistance. She says she is feeling "terrible" and attributes it to a "cold". She says her nose is plugged and congested. She also complains of a scratchy throat, a post nasal drip. She has a slight cough. She does not have a fever. She has taken medicine for "high blood pressure" for five years. She says she takes no non-prescription medications and has no drug allergies.

Which of the following would be the best advice:

- (a) recommend an oral cold product containing a nasal decongestant
- (b) recommend a topical nasal decongestant
- (c) recommend a expectorant cough product
- (d) recommend that she see a physician as soon as possible
- (e) both c and d

Advising Patients On Non Prescription Medications

Cold Medications

POST TEST

True/False: Circle either T or F to indicate the answer that you believe is most appropriate.

1. Topical nasal decongestants take longer to be absorbed into the systemic circulation and therefore have a slower response than systemic nasal decongestants. T F
2. Non-prescription preparations intended for topical application containing naphazoline should not be used in children and infants under 6 years old. T F
3. Allergic rhinitis and respiratory infections due to Strep. pyogenes may produce symptoms resembling a common cold. T F
4. A patient on a regimen of propylthiouracil can safely take Eltor capsules to relieve his cold symptoms. T F
5. Rebound congestion is one possible adverse effect of systemic nasal decongestants. T F
6. Fever is a symptom that usually accompanies the common cold. T F

Circle the ONE BEST answer.

1. Which of the following is NOT a general measure to recommend each time to relieve the symptoms of the common cold?
 - (a) humidification
 - (b) Antihistamines and/or sympathomimetic amines
 - (c) bed rest
 - (d) A.S.A. or Acetaminophen
 - (e) increase fluid intake
2. A consumer has asked for assistance in selecting a non-prescription cold product. He has the following symptoms; sore throat, post nasal drip, nasal congestion, a fever and sore muscles. He has a productive cough producing greenish phlegm. He says the symptoms were first noticed about seven days ago. The individual is not being treated by a physician, takes no prescription nor non-prescription drugs and has no allergies.

Which of the following would be the best advice to this customer?

 - (a) recommend non-prescription products to relieve the cough and congestion
 - (b) suggest that he see a physician as soon as possible
 - (c) recommend an oral cold product
 - (d) recommend a topical nasal decongestant
 - (e) both a and b
3. A consumer asks you for assistance concerning what he believes to be a "cold". He says he is bothered by nasal congestion, a mild sore

throat and a post nasal drip which is keeping him awake at night. The symptoms developed in the last 24 hours. He says he has no fever, no cough and generally feels good. He takes no prescription medication nor non-prescription medication. He has no drug allergies.

Which of the following would be the best advice for this individual?

- (a) recommend he see a physician as soon as possible
 - (b) recommend an oral cold product containing a nasal decongestant
 - (c) recommend a topical nasal decongestant
 - (d) either b or c
 - (e) all of the above
4. Which of the following nasal decongestants may be administered topically and systemically:
- (a) propylephrine
 - (b) pseudoephedrine
 - (c) oxymetazoline
 - (d) phenylephrine
 - (e) xylometazoline
5. The role of sympathomimetics in the treatment of the symptoms of a cold is:
- (a) to stimulate the adrenergic receptors of the vascular smooth muscle and thus reduce the blood flow to the nasal mucosa
 - (b) to dilate the blood vessels in the nasal mucosa
 - (c) to increase the flow of blood to the nasal mucosa
 - (d) to stimulate the adrenergic receptors to cause bronchoconstriction to ease breathing
 - (e) all of the above
6. Which of the following is usually NOT a symptom of the common cold in adults?
- (a) fever
 - (b) sneezing
 - (c) sore throat
 - (d) nasal discharge
 - (e) nasal obstruction
7. Which of the following is NOT a characteristic of the common cold?
- (a) the "cold" accounts for approximately 40% of the lost time from work
 - (b) the incidence is higher in males than females
 - (c) the incidence is higher in females than males
 - (d) the incidence is higher in winter than summer
 - (e) the incidence is higher in children than adults
8. A consumer has asked for assistance in selecting a non-prescription cold product. She has the following symptoms; sore throat, nasal congestion, post nasal drip and a slight cough which is non-productive in nature. She is a diabetic and has been taking Diabinese^R for several years. She says she takes the occasional laxative. She has no allergies.
- Which of the following would be the best advice for this individual?
- (a) recommend an oral cold product for the congestion and an antitussive cough preparation
 - (b) recommend an oral cold product

- (c) suggest that she see a physician as soon as possible
- (d) recommend a topical nasal decongestant
- (e) both c and d

9. Mrs. Smith wants your assistance. She says she is feeling "terrible" and attributes it to a "cold". She says her nose is plugged and congested. She also complains of a scratchy throat, a post nasal drip. She has a slight cough. She does not have a fever. She has taken medicine for "high blood pressure" for five years. She says she takes no non-prescription medications and has no drug allergies.

Which of the following would be the best advice:

- (a) recommend an expectorant cough product
- (b) recommend an oral cold product containing a nasal decongestant
- (c) recommend a topical nasal decongestant
- (d) recommend that she see a physician as soon as possible
- (e) both c and d

Advising Patients on Non Prescription Medications
Analgesics
PRE TEST

Circle the ONE BEST answer.

- A. Aspirin interacts with numerous prescription drugs, sometimes with serious complications. Assume that you have just dispensed the following prescriptions. Which patient should be warned about the interaction and advised to avoid concurrent ingestion of aspirin:
1. The patient on:
 - (a) Diazepam (Valium)
 - (b) Pentids
 - (c) Coumadin
 - (d) Hydrodiuril
 - (e) Ismelin
 2. The patient on:
 - (a) Tuinal
 - (b) Inderal
 - (c) Gantrisin
 - (d) Diabinese
 - (e) Lanoxin
 3. The patient on:
 - (a) Achromycin
 - (b) Dyazide
 - (c) Thyroid
 - (d) Nitroglycerin
 - (e) Butazolidin
- B. Acetaminophen is a useful alternative to aspirin in patients who are allergic to the latter. However, acetaminophen cannot substitute for aspirin in all instances. Which of the following patients would not benefit from a switch to acetaminophen:
- The patient needing relief from:
- (a) fever
 - (b) headaches
 - (c) muscle pain
 - (d) inflammation of the joints
 - (e) b and c above
- C. The biphasic action of the salicylates in uric acid clearance is a dose-related phenomenon. Which of the following doses of aspirin would bring out the symptoms of a borderline gout patient?
- (a) less than 2.4 gms per day
 - (b) 3 to 6 gms per day
 - (c) 9 to 10 gms per day
 - (d) more than 10 gms per day
 - (e) a and d above

- D. In talking to a patient you learn that he has a history of severe peptic ulcer disease. He is not taking any prescription or non-prescription drugs currently.
1. He asks for your advice on an effective pain-reliever which of the following would you suggest?
 - (a) Frosst's 222's
 - (b) Ecotrin
 - (c) Tylenol
 - (d) Entrophen
 - (e) Alka Seltzer
 2. If the ulcer patient also suffered from angina and you knew he was taking nitroglycerin to relieve it which of the following products would help relieve his headache:
 - (a) Sinutabs
 - (b) Campain
 - (c) Frosst's 222's
 - (d) all of the above
 - (e) none of the above
- E. A middle-aged female with a history of chronic rhinorrhea has been taking aspirin for menstrual cramps. She reports severe shortness of breath and wonders why. What would you tell her?
 - (a) her asthma is related to the rhinorrhea
 - (b) her asthma is due to an aspirin allergy
 - (c) her asthma is a result of the rhinorrhea and menstruation
 - (d) her asthma is unrelated to any of the factors named
- F. A patient stabilized on Benemid asks if there would be any harm in the occasional dose of aspirin to relieve his pains. What would you tell him?
 - (a) there is no reason why he shouldn't take aspirin
 - (b) the aspirin will affect his Benemid regimen but only slightly, so it can be taken
 - (c) he should notify his physician so that the dose of Benemid can be adjusted
 - (d) the combination of aspirin and Benemid should be avoided at all costs

Advising Patients on Non Prescription Medications

Analgesics

POST TESTS

Circle the ONE BEST answer.

- A. The biphasic action of the salicylates in uric acid clearance is a dose-related phenomenon. Which of the following doses of aspirin would bring out the symptoms of a borderline gout patient?
- (a) more than 10 gms per day
 - (b) less than 2.4 gms per day
 - (c) 3 to 6 gms per day
 - (d) 9 to 10 gms per day
 - (e) a and d above
- B. Acetaminophen is a useful alternative to aspirin in patients who are allergic to the latter. However, acetaminophen cannot substitute for aspirin in all instances. Which of the following patients would not benefit from a switch to acetaminophen:
- The patient needing relief from:
- (a) inflammation of the joints
 - (b) fever
 - (c) headaches
 - (d) muscle pain
 - (e) b and c above
- C. A patient stabilized on Benemid asks if there would be any harm in the occasional dose of aspirin to relieve his pains. What would you tell him?
- (a) the combination of aspirin and Benemid should be avoided at all costs
 - (b) there is no reason why he shouldn't take aspirin
 - (c) he should notify his physician so that the dose of Benemid can be adjusted
 - (d) the aspirin will affect his Benemid regimen but only slightly, so it can be taken
- D. In talking to a patient you learn that he has a history of severe peptic ulcer disease. He is not taking any prescription or non-prescription drugs currently.
1. He asks for your advice on an effective pain-reliever which of the following would you suggest?
- (a) Frosst's 222's
 - (b) Ecotrin
 - (c) Tylenol
 - (d) Alka Seltzer
 - (e) Entrophen

1. If the ulcer patient also suffered from angina and you knew he was taking nitroglycerin to relieve it which of the following products would help relieve his headache:
 - (a) Frosst's 222's
 - (b) Campaign
 - (c) Sinutabs
 - (d) all of the above
 - (e) none of the above
- E. Aspirin interacts with numerous prescription drugs, sometimes with serious complications. Assume that you have just dispensed the following prescriptions. Which patient should be warned about the interaction and advised to avoid concurrent ingestion of aspirin:
 1. The patient on:
 - (a) Nitroglycerin
 - (b) Butazolidin
 - (c) Dyazide
 - (d) Achromycin
 - (e) Thyroid
 2. The patient on:
 - (a) Diazepam (Valium)
 - (b) Hydrodiuril
 - (c) Ismelin
 - (d) Pentids
 - (e) Coumadin
 3. The patient on:
 - (a) Diabinese
 - (b) Lanoxin
 - (c) Inderal
 - (d) Tuinal
 - (e) Gantrisin
- F. A middle-aged female with a history of chronic rhinorrhea has been taking aspirin for menstrual cramps. She reports severe shortness of breath and wonders why. What would you tell her?
 - (a) her asthma is unrelated to any of the factors named
 - (b) her asthma is related to the rhinorrhea
 - (c) her asthma is a result of the rhinorrhea and menstruation
 - (d) her asthma is due to an aspirin allergy

APPENDIX E: EVALUATION FORM

Page

1. Continuing Education Program Evaluation Form.
2. Table XXXIV. The Intercorrelations of the Participants' Ratings of the Program Dimensions, Year of Graduation and Attendance at Previous Courses.

Faculty of Pharmaceutical Sciences
University of British Columbia

LINK ____

CONTINUING EDUCATION COURSE EVALUATION
ADVISING PATIENTS ON THE USE OF NON PRESCRIPTION DRUGS

To help us present programs that meet your needs please complete form as directed.

YEAR OF GRADUATION OR FIRST LICENSURE _____

This is your opportunity to evaluate certain aspects of this course. We would like you to compare this continuing education program with the average continuing education course you have attended in the past. (The comparison is to be made by drawing lines to indicate the extent of any difference. If in your opinion the present course is only one half as good as the average continuing pharmaceutical education course then draw a line one half as long. If in your opinion this course is two-and-one-half times better than the average continuing pharmaceutical education course, draw a line two-and-one-half times as long as the standard line.)

I. If the average continuing education course can be represented by a line of this length for each of the following items:

could you now indicate how satisfied you are with the present program on the following dimensions?

Example. Opportunities for talking to members of opposite sex.
Average C.E. course.

This course.

1. Usefulness of material learned.
Average C.E. course.

This C.E. course.

2. Use of material for advising patients.
Average C.E. course.

This C.E. course.

3. Material too elementary.
Average C.E. Course.

This C.E. course.

4. Emphasis on drug products.
Average C.E. course.

This C.E. course.

5. Emphasis on signs and symptoms of relevant diseases.
Average C.E. course.

This C.E. course.

6. Length of lectures.
Average C.E. course.

This C.E. course.

7. Speakers were knowledgeable and presented material well.
Average C.E. course.

This course.

8. Usefulness of handouts.
Average C.E. course.

This C.E. course.

9. Opportunity for discussion.
Average C.E. course.

This C.E. course.

10. Usefulness of pre/post tests.
Average C.E. course.

This course.

11. Efficient learning experience. (Was it worth your time and money
for what you learned?)
Average C.E. course.

This C.E. course.

12. Preferable learning experience. (Future courses should be presented like this one)

Average C.E. course.

This C.E. course.

|

II. If the length of the line below represents the amount of learning that can be attributed to the average 30 minute lecture in a continuing education course,

average learning in a 30 minute lecture:

Would you please indicate the amount of learning attributable to the following activities in this program?

Example. Coffee breaks.

Average lecture.

Coffee breaks in this course

1. Simulations.

2. Videotapes.

3. Pre/post tests.

4. The lectures.

5. Buzz groups.

6. Large group discussion with speakers.

7. The question and answer periods.

III. HOW MANY C.E. COURSES HAVE YOU ATTENDED IN THE PREVIOUS 3 YEARS?

TABLE XXXIV

THE INTERCORRELATIONS OF THE PARTICIPANTS' RATINGS OF THE PROGRAM DIMENSIONS,
YEAR OF GRADUATION AND ATTENDANCE AT PREVIOUS COURSES

VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1		-0.27	<u>-0.42*</u>	0.02	-0.39	-0.37	-0.17	-0.39	<u>-0.56</u>	-0.20	-0.41	-0.28	-0.39	-0.30
2			<u>0.76</u>	0.15	<u>0.49</u>	<u>0.72</u>	0.18	<u>0.68</u>	<u>0.70</u>	0.02	0.30	<u>0.66</u>	<u>0.44</u>	-0.07
3				0.07	<u>0.58</u>	<u>0.73</u>	0.16	<u>0.67</u>	<u>0.76</u>	0.05	0.21	<u>0.61</u>	<u>0.50</u>	0.15
4					-0.24	0.00	-0.21	0.05	0.25	-0.15	-0.31	-0.20	-0.05	-0.06
5						<u>0.45</u>	-0.20	0.25	<u>0.53</u>	0.06	<u>0.47</u>	<u>0.50</u>	<u>0.47</u>	0.15
6							0.09	<u>0.59</u>	<u>0.59</u>	0.16	0.15	<u>0.45</u>	<u>0.52</u>	0.24
7								<u>0.60</u>	<u>0.42</u>	0.28	0.17	0.30	0.03	<u>-0.50</u>
8									<u>0.75</u>	0.22	0.24	<u>0.70</u>	<u>0.53</u>	-0.29
9										0.24	0.14	<u>0.54</u>	<u>0.45</u>	-0.03
10											0.20	0.26	0.41	-0.06
11												0.33	0.13	-0.16
12													<u>0.54</u>	-0.17
13														0.21
14														

VARIABLES: 1 = YEAR OF GRADUATION, 2 = USEFULNESS OF MATERIAL, 3 = USE OF MATERIAL FOR ADVISING PATIENTS, 4 = MATERIAL TOO ELEMENTARY, 5 = PROPER EMPHASIS ON DRUG PRODUCTS, 6 = PROPER EMPHASIS ON THE SIGNS AND SYMPTOMS OF THE RELEVANT DISEASES, 7 = LENGTH OF LECTURES, 8 = SPEAKERS WERE KNOWLEDGE-ABLE AND PRESENTED MATERIAL WELL, 9 = USEFULNESS OF HANDOUTS, 10 = OPPORTUNITY FOR DISCUSSION, 11 = USEFULNESS OF PRE/POST TESTS, 12 = EFFICIENT LEARNING EXPERIENCE, 13 = PREFERABLE LEARNING EXPERIENCE, 14 = NUMBER OF PREVIOUS C.E. COURSES ATTENDED.

* THOSE COEFFICIENTS UNDERLINED ARE SIGNIFICANT AT THE 0.05 LEVEL OF SIGNIFICANCE.