

**DRUG-RELATED PROBLEMS in HOME CARE PATIENTS**

A Thesis

submitted to the Faculty of Graduate Studies & Research

in Partial Fulfillment of the Requirements

for the Degree of

Master of Science in Pharmacy

by

Mary Lynn Flock, B. S. Pharm.

Saskatoon, Saskatchewan

(c) 1985. M. L. Flock

The author has agreed that the library, University of Saskatchewan, may make this thesis freely available for inspection. Moreover, the author has agreed that permission for extensive copying of this thesis for scholarly purposes may be granted by the professor or professors who supervised the thesis work recorded herein or, in their absence, by the Head of the Department or the Dean of the College in which the thesis work was done. It is understood that due recognition will be given to the author of this thesis and to the University of Saskatchewan in any use of the material in this thesis. Copying or publication or any other use of the thesis for financial gain without approval by the University of Saskatchewan and the author's written permission is prohibited.

Requests for permission to copy or to make other use of material in this thesis in whole or in part should be addressed to:

Dean of the College of Pharmacy  
University of Saskatchewan  
Saskatoon, Saskatchewan S7N 0W0  
Canada

## ACKNOWLEDGMENTS

To my advisor, Linda Suveges, for her friendship, her guidance and her invaluable support during the past two years.

To Dr. Sylvia Wallace for her assistance throughout this research and especially for her help during the last month of preparation of my thesis.

To the other members of my thesis committee - Dr. Jim Blackburn, Dr. Wayne Hindmarsh, Dr. J. Leszczynski and Mrs. Betty Riddell for their assistance and guidance throughout my research. To Eva Lee, my external examiner, to whom I would like to extend a special thank-you.

To Dr. Gordon Johnston ( Department of Pharmacology, Faculty of Medicine ) for allowing me to use his computer while mine was not operational.

To my parents whose support, encouragement and understanding contributed immeasurably to my completing my M.Sc. program.

To Randy Cook to whom I owe so much. His never failing good humour and his support will never be forgotten.

To Dancing Paws, my Basenji, who was a faithful friend and companion even when I was too busy to notice her presence.

To Joyce Monkhouse, for her friendship, her caring and her "dog-sitting" when I was so busy.

To Mrs. Dorothy Yates and her staff in the Saskatoon Rehabilitation Home Care office for their assistance with and enthusiasm for my project.

To the Medical Research Council of Canada for my studentship covering the two years I was enrolled in the M.Sc. program.

## ABSTRACT

Home health care programs have been recognized as a cost-effective method of providing health care to patients in the familiar surroundings of their home. The services provided by such a program have been viewed as an extension of those found in hospital and have included nursing and social services as well as occupational and physical therapy. However, pharmacy as yet has not been regarded among those services considered necessary.

This study was designed to determine if patients in a home care program, specifically the Saskatoon Rehabilitation Home Care Program (SRHCP) experience difficulties with their drug treatment regimens. The objectives of the study were to assess the number of drug-related problems faced by patients and to identify factors contributing to these problems.

The study population consisted of the 432 patients registered in the SRHCP in January 1985. From this group, 74 patients were chosen at random and were personally interviewed by the author using a pre-tested questionnaire. Data was analyzed using the SPSS-X computer program package. Frequencies of responses were tabulated for all questions. Relationships between selected variables were examined by nonparametric correlation (Spearman's rank correlation coefficient) or chi-square analysis. Probability values  $< 0.05$  were considered statistically significant.

Among patients registered with the SRHCP, females outnumbered the males in a ratio of approximately 1.4 to 1. Patients 65 years and older comprised 60.3% of this population; 33.8% of all patients lived alone.

Twenty-five patients (35.7%) were found to be noncompliant with one or more of their medications. Fifty-seven percent of the patients knew the use of all their prescribed drugs and only 4 patients (5.7%) did not know the use of any. More than 50% of patients stated they had

not been given information on their prescription drugs and 87.7% named the physician as the first person they would contact if they had a problem with any of their medication. Eighty-one percent of patients said they bought their prescription drugs at one pharmacy only.

Fifty-four patients were taking nonprescription drug products with the average number per patient being 1.7 for those patients <65 years and 2.4 for those 65 years and older. Of the total 154 nonprescription drugs being taken, 72.7% were used for an officially recommended purpose and 96.7% were taken in an officially approved dose. Sixty-three percent of patients purchased their nonprescription drugs at a pharmacy.

Fifty-two patients (70.3%) interviewed were assessed as having one or more drug-related problems. More of these problems were patient-related than physician-related. An increasing number of drug-related problems in a patient was associated with an increasing number of diagnoses, an increasing number of prescription drugs and a decreasing degree of patient compliance with drug treatment regimens. Neither patient compliance nor the total number of drug-related problems were related to the age of the patient. The number of prescription drugs taken influenced patient compliance. Patients taking more drugs were compliant with a smaller percentage of their prescription medications.

There was no difference found between patients <65 years and those 65 yr and older with respect to the number of drugs (both prescribed drugs & OTC drug products) being taken by the patient, the percentage of prescription drugs for which the patient knew the name and the percentage of prescription drugs for which the patient knew the use.

A significant portion of the patients in the SRHCP had drug-related problems which could be identified by a pharmacist. As a full-time member of the home care team, a pharmacist could assist in identifying and solving drug-related problems by specific interventions with patients and physicians and by general education programs for patients and home care personnel.

## TABLE of CONTENTS

Chapter	Page
ACKNOWLEDGMENTS . . . . .	iii
ABSTRACT . . . . .	iv
LIST OF TABLES . . . . .	xiii
GLOSSARY . . . . .	xiv
I. INTRODUCTION . . . . .	1
II. HOME HEALTH CARE . . . . .	3
1.0 Introduction . . . . .	3
2.0 The Pharmacist's Role in Home Care . . . . .	4
3.0 The Saskatoon Rehabilitation Home Care Program . . . . .	10
III. DRUG-RELATED PROBLEMS FACED by PATIENTS . . . . .	14
1.0 Category I : Problems with Medications that Directly Involve the Patient . . . . .	15
1.1 Compliance . . . . .	15
1.1.1 Introduction . . . . .	15
1.1.2 Consequences of Noncompliance . . . . .	15
1.1.3 The Noncompliant Patient . . . . .	17
1.1.4 Factors Affecting Noncompliance . . . . .	18
1.1.4.1 Failure to comprehend the importance of therapy. . . . .	18
1.1.4.3 Poor understanding of the instructions . . . . .	20
1.1.4.4 Multiple drug therapy . . . . .	21
1.1.4.5 Frequency of administration . . . . .	21
1.1.4.6 Duration of Therapy . . . . .	22
1.1.4.6 Adverse effects . . . . .	23
1.1.4.7 Fear of becoming drug dependent . . . . .	23

	1.1.4.8	Lack of symptoms . . . . .	24
	1.1.4.9	Cost of medication . . . . .	24
	1.1.4.10	Unpleasant taste of medication . . . . .	25
	1.1.4.11	Miscellaneous factors . . . . .	25
	1.1.5	Ways to Improve Compliance . . . . .	26
	1.1.6	Methods of Measuring Compliance . . . . .	28
	1.1.7	Summary Statement on Compliance . . . . .	31
	1.2	Nonprescription Medications (Over-the-Counter or OTC Medications) . . . . .	31
	1.3	Method of Taking Medication . . . . .	38
2.0	Category II : Problems with Medications that Directly Involve the Physician(s) Prescribing the Drug(s) . . . . .		39
IV.	PURPOSE of the STUDY . . . . .		42
	1.0	The Problems . . . . .	42
	2.0	The Objectives of the Study . . . . .	43
V.	METHODOLOGY . . . . .		45
	1.0	Study Population . . . . .	45
	2.0	Study Design . . . . .	45
	2.1	Approval of Study Design . . . . .	45
	2.2	Development of the Questionnaire . . . . .	46
	2.3	Patient Contact . . . . .	47
	2.4	Administration of the Questionnaire . . . . .	47
	2.5	Data Analysis . . . . .	48
VI.	RESULTS . . . . .		49
	1.0	Demographic Variables . . . . .	49
	1.1	Sex . . . . .	49
	1.2	Age . . . . .	50

1.3	Diagnosis . . . . .	50
1.4	Allergies . . . . .	50
1.5	Living Arrangements . . . . .	53
1.6	Home Care History . . . . .	53
2.0	Prescription Medications . . . . .	55
2.1	Number of Prescription Drugs Patients Were Taking . . . . .	55
2.2	Number of Prescription Drugs for which Name & Strength were known	55
2.3	Expiry Dates and Prescription Drugs . . . . .	56
2.4	Length of Time Patients Had Been Taking Their Prescription Drugs . .	56
2.5	Number of Prescription Medications Not Being Taken by the Patient .	56
2.6	Noncompliance & Reasons Given for Noncompliance . . . . .	58
2.6.1	Number of prescription drugs with which patients are noncompliant . . . . .	58
2.6.2	Reasons for noncompliance . . . . .	58
2.7	Storage of Prescription Medication . . . . .	60
2.8	Patients' Knowledge of What their Prescription Drugs Are For . . .	60
2.9	Patients' Knowledge of Whether to Add Certain Foods or to Avoid Certain Drugs or Foods when Taking Prescription Drugs . . . .	61
2.10	Patients' Knowledge of What To Do if a Dose of Medication is Missed . .	61
2.11	Prescription Drugs & Side Effects . . . . .	62
2.12	Prescription Drug Information . . . . .	62
3.0	Nonprescription or OTC (Over-the-Counter) Medication . . . . .	64
3.1	Number of OTC Medications Taken by Patients . . . . .	64
3.2	Type of OTC Taken . . . . .	64
3.3	Number of OTC's for which Name & Strength Were Known . . . . .	66
3.4	Expiry Dates & OTC Drugs . . . . .	66
3.5	Number of Nonprescription Drugs Not Being Taken by the Patient . .	66



3.6	Storage of Nonprescription Medication . . . . .	67
3.7	Patients' Knowledge of What Their Nonprescription Drugs Are For . . .	67
3.7.1	Number of patients who knew the reason they were taking each OTC drug . . . . .	67
3.7.2	Number of patients using an OTC drug for a recommended purpose . . . . .	67
3.8	Number of OTC Drugs for Which a Recommended Dose is Being Used . .	68
3.9	How Patients Decide to Take OTC Products . . . . .	68
3.10	Where Patients Procure OTC Drugs . . . . .	70
3.11	OTC Drugs & Side Effects . . . . .	70
3.12	Drug Information Requested By Patients During the Interview . . .	70
4.0	Other Information . . . . .	72
4.1	Medication Taken With Food or Liquid . . . . .	72
4.2	Multiple Doctoring Information . . . . .	72
4.2.1	Number of physicians seen by a patient . . . . .	72
4.2.2	Prescriptions - from more than one physician . . . . .	72
4.2.3	Number of pharmacies with which patients deal . . . . .	73
4.3	Person Whom Patient Asks if Information on Drugs Is Required . . .	73
4.4	Assistance in Remembering Medication . . . . .	73
4.5	Method Used by Patients to Get Their Medication . . . . .	73
4.6	Time for Interview . . . . .	75
4.7	Drug-Related Problems Faced by Patients . . . . .	75
4.7.1	Total number of drug-related problems recorded . . . . .	75
4.7.2	Number of problems directly related to the patient . . . . .	75
4.7.3	Number of problems directly related to the physician . . . . .	77
5.0	Analysis of Selected Data Using Nonparametric Correlation & Chi-Square Analysis . . . . .	77

5.1	Relationship Between "Compliance" & Selected Variables . . . . .	77
5.2	Relationship Between the Number of Drug-related Problems Faced by Patients & Selected Variables . . . . .	81
5.3	Relationship Between Knowledge of Prescription Drugs & Selected Variables . . . . .	82
5.3.1	Percentage of prescription drugs for which the patient knew the name & selected variables . . . . .	82
5.3.2	Percentage of prescription drugs for which the patient knew the use & selected variables . . . . .	83
5.4	Relationship Between the Number of Nonprescription Drugs Being Taken by the Patient & Selected Variables . . . . .	83
5.5	Relationship of Selected Variables to Age . . . . .	84
5.6	Miscellaneous Relationships . . . . .	85
VII.	DISCUSSION . . . . .	86
1.0	Introduction . . . . .	86
2.0	Prescription Drugs & Drug-Related Problems . . . . .	87
2.1	Multiple Drug Therapy . . . . .	87
2.2	Failure to Comprehend the Importance of Therapy . . . . .	88
2.3	Noncompliance With or Misuse of Medication . . . . .	90
3.0	Nonprescription Drugs & Drug-Related Problems . . . . .	92
4.0	Selected Demographic Variables & Drug-Related Problems . . . . .	93
4.1	Living Arrangements . . . . .	93
4.2	Age . . . . .	94
4.3	Home Care History - Time Since the Patient was First Admitted into the Program . . . . .	95
5.0	Lack of Provision of Drug Information & Drug-Related Problems . . . . .	96

6.0	Total Number of Drug-Related Problems Faced by Patients & Factors	
	Related to These . . . . .	.98
7.0	The Pharmacist as a Member of the Home Care Team . . . . .	101
8.0	Limitations of the Study . . . . .	104
VIII.	CONCLUSIONS . . . . .	106
IX.	RECOMMENDATIONS FOR FUTURE RESEARCH . . . . .	109
APPENDIX I:	Original Questionnaire . . . . .	110
APPENDIX II:	Revised Questionnaire . . . . .	120
APPENDIX III:	Letter Sent to Patients . . . . .	138
APPENDIX IV:	Detailed Results of the Number of Patients Recorded as	
	Having a Specific Diagnosis . . . . .	140
APPENDIX V:	Detailed Results of the Number of Prescribed Drugs that	
	a Patient was Taking . . . . .	141
APPENDIX VI:	Number of Prescription Medications for which Patients Knew	
	the Name and the Strength . . . . .	142
APPENDIX VII:	Detailed Results of Length of Time Patients had been Taking	
	their Prescription Medication . . . . .	143
APPENDIX VIII:	Detailed Results of Patients' Knowledge Concerning What	
	their Prescription Drugs Are For . . . . .	144
APPENDIX IX:	Detailed Results of the Number of Nonprescription Drugs	
	Taken by Patients . . . . .	145
APPENDIX X:	Detailed Results of Type(s) of OTC Medications Being Taken	
	by Patients . . . . .	146
APPENDIX XI:	Detailed Results of Number of Nonprescription Drugs for which	
	a Patient Knew the Name and Knew the Strength . . . . .	147

APPENDIX XII:	Number of Nonprescription Drugs Having an Expiry Date . . .	148
APPENDIX XIII:	Detailed Results of the Number of OTC Medications for which the Patients Knew the Use . . . . .	149
APPENDIX XIV:	Complete Results Showing the Number of OTC Drugs Being Used for a Recommended Purpose . . . . .	150
APPENDIX XV:	Complete Data for the Number of OTC Drugs Used in a Recommended Dose . . . . .	151
APPENDIX XVI:	Time for Interview . . . . .	152
APPENDIX XVII:	Complete Results of Nonparametric Analysis of Selected Variables (using Spearman's Rank Correlation Coefficient) . . . . .	153
REFERENCES	. . . . .	159

## LIST OF TABLES

Table	Page
I. Factors Contributing to Noncompliance . . . . .	19
II. Methods of Measuring Medication Compliance . . . . .	29
III. Mean Rates of Adult Nonprescription Medicine Use . . . . .	34
IV. Prevalence of Illness & Selected Behaviour During a 2-week Period . . . . .	35
V. Ages of Patients Interviewed (Displayed in Groups) . . . . .	51
VI. Number of Patients Recorded as Having a Specific Diagnosis . . . . .	52
VII. Time Since Patient First Admitted into the SRHCP . . . . .	54
VIII. Number of Prescription Drugs Found to Have an Expiry Date . . . . .	57
IX. Patient Knowledge of What to Do if a Dose of Prescription Medication were Missed . . . . .	63
X. Source of Prescription Drug Information Named by Patients . . . . .	65
XI. How Patients Decided to Take an OTC Medication . . . . .	69
XII. Where Patients Get Their OTC Medications . . . . .	71
XIII. Method by Which Patient Gets Medication from the Pharmacy . . . . .	74
XIV. Total Number of Drug-Related Problems Recorded for Patients . . . . .	76
XV. Correlation Between Compliance (Method I & Method II) & Selected Variables . . . . .	80

## GLOSSARY

Drug	a medicinal substance used in the treatment of disease; does not include oxygen for the purposes of this thesis.
Home health care	used interchangeably with home care. It is an array of services provided to individuals & families in their places of residence for the purpose of promoting, maintaining or restoring health & minimizing the psychological stress of illness or disability.
OTC	abbreviation for over-the-counter; a nonprescription drug or drug product (i.e., a drug which can be purchased without a prescription).
SRHCP	Saskatoon Rehabilitation Home Care program

## CHAPTER I

### INTRODUCTION

Home health care is the provision of health services to individuals and their families in the home environment. It is really an extension of hospital services into the patient's home thus allowing the patient to be discharged from hospital earlier than would otherwise be possible. Patients seem to cope better in familiar surroundings as long as the necessary support is available.

The usual services provided by a home health care program include those of a medical, nursing, social and rehabilitative (e.g., physiotherapy and occupational therapy) nature. The inclusion of a pharmacist as a member of the home health care team has not been considered a necessity. Although home care patients may take an average of five medications (Solomon *et al.*, 1978), it does not seem to be of great concern that a patient may have a complex medication regimen upon discharge from hospital. In hospital, the nursing staff makes sure the patient takes the right drug at the right time; the patient does not have to worry about this aspect of his treatment. Once the patient leaves hospital, however, responsibility for taking medications properly is suddenly shifted to that patient.

Although all other hospital services considered necessary for maintaining the patient in the home environment are provided, assistance with medication is not. Because the patient usually purchases his prescription drugs from a local pharmacy and has access to a local pharmacist if a problem arises, having a pharmacist on the home care team might seem unnecessary. However, patients may not realize a medication problem exists or patients may not visit the pharmacy in person to pick up their drugs. Therefore, it would appear that a pharmacist could make a valuable contribution to patient care by being included as a member of

the home health care team.

In an era of rising health care costs, the recommendation for hiring additional personnel must be based on concrete evidence that a need exists. This study was undertaken to investigate the frequency and extent of drug-related problems in home care patients and the resulting need for pharmacist involvement. To assess these problems, personal interviews were conducted with a group of patients randomly selected from those registered in the Saskatoon Rehabilitation Home Care program. Based on the findings, a recommendation could then be made as to whether a pharmacist should be included as a full-time member of the home care team.



## CHAPTER II

### HOME HEALTH CARE

#### 1.0 Introduction

Home care, or professional care of the patient in his home, began in the United States in 1796 (Solomon et al., 1978). Visiting nurse services appeared in several areas of the U.S.A. in the latter part of the nineteenth century. Since that time, the number of home care programs have increased in both the U.S.A. and Canada.

Home health care may be defined as an array of services provided to individuals and families in their places of residence for the purpose of promoting, maintaining, or restoring health and minimizing the psychological stress of illness or disability (Cooper et al., 1985). A home health program provides medical, nursing, social, rehabilitative and related services on an intermittent basis thus allowing the patient to be cared for at home and to avoid hospitalization. Many patients seem to cope better in their home where surroundings are familiar and family may be present. Also, home health care allows patients to achieve maximal rehabilitation with the least possible disruption of their (and the family's) usual pattern of daily living (Baumgartner et al. 1974).

At any level of care, especially home care, the principles of rehabilitation must be remembered when designing services to meet the patient's needs. These include (Baumgartner et al., 1974):

1. reducing the physical impairment of the illness or injury,
2. coping with other obstacles (such as social factors) which may prevent maximal functioning,

3. maintaining a therapeutic climate or healing climate, and
4. insuring that care is continuing and complete.

To achieve these goals, many professions must be involved and work together. Because of their unique knowledge of drugs, pharmacists are a logical addition to the home care team.

## 2.0 The Pharmacist's Role in Home Care

While patients are in hospital, their drugs are strictly controlled, but upon returning to the home, responsibility for compliance to the drug therapy regimen rests with the patient or the patient's agent (e.g., relative, friend). Since the services provided by a home health agency are an extension of institutional care into the patient's home, it is reasonable to assume that some sort of assistance with medication should continue as well. Exactly what this assistance should be( i.e., what is most beneficial) has not been decided. Because the organization of home care programs differ, there may well be no clear cut answer. However, research may provide some basic guidelines and suggestions for the contributions a pharmacist could make to a home health care program.

Although the beginnings of home health care go back to 1796 in the United States, it was not until the late 1960's and early 1970's that pharmacists began to get involved in this area. Ryder (1967) has described three roles that pharmacists should have in this setting:

1. a direct provider of services,
2. a consultant to other professional persons on the home health team, and
3. a leader in the community to promote the concept of home care.

He stated that pharmacists were most involved in the first area and urged them to develop their roles in the other two.

According to Paul Eastman ( 1971), a community pharmacist in Newport, Vermont, the services a pharmacist could offer in the area of home care include such things as:

1. the preparation of an accurate drug profile for each patient detailing allergies and drug interaction possibilities among other things,
2. the maintenance of a drug reference library for utilization by home care staff, and
3. the provision of regularly scheduled inservice training programs to the nursing personnel regarding drug therapy.

A pharmacist need not be an official member of the Home Care team in order to contribute to patient care. Eastman suggests pharmacists take the initiative and offer their expertise.

In 1978, Solomon et al., (1978) published a paper which described a 12 month study conducted with a home health service agency based at a rural community hospital in Kentucky. The purpose of this study was to identify specific problems associated with drug therapy of patients registered with this agency and to evaluate the contributions made by the pharmacist to their drug therapy. The services provided by the pharmacist included:

1. maintenance and surveillance of comprehensive patient medication profiles,
2. attendance at daily multidisciplinary conferences where therapy and progress of patients were discussed,
3. recommendations on drug therapy, and
4. provision of drug information.

Also, the pharmacist conducted an initial home visit and interview with the study patients utilizing a questionnaire to collect data regarding drug-related aspects of nonprescription and prescription drug compliance plus patient drug knowledge. A post-visit summary, containing both the pharmacist's assessment of the patient as it related to drug

therapy and recommendations pertinent to the case, was completed and became a part of the patient's home health record.

The results of this study by Solomon and his group demonstrate a need for pharmaceutical services in home health care since various drug-related problems requiring solutions were detected. Based on the experience gained while conducting the study, the following list of duties that should be performed by pharmacists serving home health agencies was developed:

1. The pharmacist is responsible for the development of drug policies and procedures for the home health service.

2. The pharmacist participates in all regularly scheduled home health conferences during which drug therapy will be discussed and recommendations made. The pharmacist provides inservice training regarding drugs for other home health personnel.

3. The pharmacist is responsible for maintaining patient medication profiles for all home health patients cared for by the agency.

4. Upon the request of home health personnel or when he deems it necessary, the pharmacist makes home visits to negotiate drug-related problems.

5. The pharmacist is responsible for the development and implementation of a prescription renewal system which assures a continuity of supply for all needed medications.

6. The pharmacist provides medication consultation to patients at time of discharge from the hospital and prior to admission to the home health care service.

These two major papers provide evidence that home health care is an area that could greatly benefit from a pharmacist's knowledge of drugs and ability to solve drug-related problems.

Although Solomon et al., (1978) investigated only one home health agency, Cooper et

al. (1985) reported comparable results in a similar study of a different home care program. The conclusions were the same in both studies -- drug-related problems exist in home care patient programs and there is a definite need for a pharmacist for consultation purposes.

Nearly 30% of all medications taken by the patients in the study conducted by Cooper *et al.* were ones not requiring a prescription. Although most were taken correctly and patients had few problems associated with their use, it was felt that a consultant pharmacist could assist the patient in a more rational product selection in many cases.

The study also indicated that educated patients who have the reinforcement of someone living with them and reminding them to take the medication are more likely to be compliant. However, nearly 29% of the population lived alone. Also, one-third of all patients inappropriately stopped taking their drugs. Both these factors indicated a need for continued reinforcement of the importance of the proper use and scheduling of medication, an area especially suited to pharmacist involvement.

When reviewing the overall medications, Cooper *et al.*, (1985) also found that nearly 15% were therapeutic duplications. Most duplications involved nonprescription medications, i.e. laxatives or analgesics. Nearly one-half of these duplications could have been eliminated without adversely affecting the patient or his treatment. Thus it was felt that the utilization of a consultant pharmacist in this area could result in a decreased expenditure for drugs.

All these findings led Cooper *et al.*, (1985) to the delineation of the following areas that they felt could benefit from the services of a pharmacist:

1. drug therapy consultation with patients and other agency staff and physicians,
2. drug regimen review,
3. drug information resource for the agency staff, and

#### 4. patient education.

Thus the studies to date show conclusively that there is a need for a pharmacist to be a part of the Home Health Care team. Several areas of contribution have been identified. As each Home Health Care program is different, the exact role of the pharmacist would depend on each program's unique needs. As well, all studies thus far have been conducted in the United States where funding for Home Care agencies differs from that in Canada. Whether such differences will affect the utilization of pharmacists in helping home care patients with drug-related problems in Canada remains to be seen. Such concerns do not change the need for pharmacist participation; pharmacists must now determine how they may best contribute to the care of this group of patients.

One unique arrangement between an agency providing home health care and pharmacists involves the Visiting Nurse Home Health Service (VNHHS) of Lafayette, Indiana and the School of Pharmacy of Purdue University (Kitt, 1984). The latter provides consultant pharmacist services utilizing doctor of pharmacy candidates in exchange for the opportunity to develop a clerkship site for pharmacy students in home health care. This arrangement circumvents the problem of reimbursement for nondispensing pharmacy services. The pharmaceutical services include:

1. review of patient medication regimens and provision of information to the nurses with respect to drug use, common side effects and precautions to be considered in drug administration. (Drug-related problems were conveyed to the nurses who contacted the physician in question.)

2. acting as a liason between the VNHHS and other health professionals, such as pharmacists in local hospitals or community pharmacies, to assure cooperation,

3. provision of drug information to the nurses on request as well as through scheduled inservices.

The pharmacists in this university program who have worked with clients of the visiting nurse service have encouraged hospital and community pharmacists to expand their services to patients served by home care agencies.

From generalized home health care programs, a specialized home infusion service has evolved. Such services certainly fall under the definition of home care yet they often are provided to patients who are not registered under a formal Home Care program. The impetus to the development of home infusion services including nutritional support and cancer chemotherapy is the containment of health care costs (Reed, 1985). More recently, the administration of antimicrobials in the home has been considered as a means of decreasing costs. Barriere (1985) suggested that patients who are clinically stable and whose diseases require prolonged therapy e.g., osteomyelitis, endocarditis, pulmonary infections with cystic fibrosis and certain fungal infections, could be discharged from hospital early and therapy could continue to be administered at home by the patient or patient's family. This tactic could result in enormous cost savings.

The evolution of home health care to encompass such complicated infusion services has created new responsibilities and opportunities, particularly for hospital pharmacists (McAllister, 1985). The need to ensure that the quality and continuity of service to home health care patients with respect to home infusions are consistent with that provided to the patient while he was in hospital rests largely with the pharmacist. Because of the importance of ensuring patients continue to receive the best health care possible, it is critical that pharmacists become intimately involved in any program being set up to allow the patient to

receive infusions of drugs at home.

### 3.0 The Saskatoon Rehabilitation Home Care Program (Yates, 1985)

The Saskatoon Rehabilitation Home Care Program (the SRHCP) was established in 1959 as a pilot project which was to run for a two year period under the direction of Dr. T.E. Hunt, then Director of the Department of Rehabilitation Medicine at University Hospital, Saskatoon. The project was financed by a Federal-Provincial grant and was limited to patients with neuromuscular disability and senile psychosis who might be expected to improve under home care management.

The Program has expanded over the years to include patients who are referred by any practising Saskatoon physician and who require active rehabilitation or maintenance programs. Funding is now entirely provided by the provincial government through the Continuing Care branch of the Department of Health.

The purpose of the SRHCP is to provide health care services to individuals in their own homes in order to:

1. assist individuals to become or remain as independent as possible and
2. assist individuals and their families to adjust to and cope with the changes related to that patient's illness, injury or disability.

Other objectives of this program include:

1. provision of an environment for research in the area of rehabilitation and
2. provision of clinical experiences to various professional and para-professional teaching programs.

The services provided by the SRHCP are those of physiotherapy, occupational therapy and



medical social work. These are available to qualifying individuals residing in the City of Saskatoon and surrounding area who are insured under the Saskatchewan Hospital Services Plan. Other support services available are the provision of medical supplies and equipment, laundry services, medications under special circumstances and laboratory services plus the delivery of supplies and equipment. Referrals are made to Home Care - Saskatoon, District #45 Inc. ( a provincial home care program ) for nursing, homemaking, home maintenance and meal service.

How the SRHCP fits into the province's home care program is interesting to note. In 1979, twenty years after the beginnings of the SRHCP , the Saskatchewan government implemented a province-wide service in the area of home care. Saskatchewan was divided into 45 districts, each with its own board to regulate affairs. Within each district the following services were to be provided: nursing, homemaking, home maintenance and meal service. Each board was given the power to decide in what way to make these services available. Either of the following options were open:

1. contracting out the services to organizations who were already providing them (e.g., If the Victorian Order of Nurses were currently offering nursing service in an area, the board could decide to enter into a contractual agreement with them to continue the same service under the provincial home care program.) or

2. setting up the services on their own.

Saskatoon's board was in place by 1982 and implemented the provincial program by following the latter option. Because of this decision, the government diverted funding from the Victorian Order of Nurses in Saskatoon to the nursing service under the auspices of the provincial home care program since funding of both would have been a duplication.

At the time that the provincial program was being formed, the Saskatoon Rehabilitation

Home Care program was not made a part of the provincial organization except in the area of funding. It was recognized that the SRHCP had been in existence for a long while; it was filling a need; and it was, and still is, the only hospital-based program in Saskatchewan.

As just mentioned, the SRHCP is funded by the same government department as is the provincial home care program. The funds are administered by University Hospital and the Coordinator of the SRHCP reports directly to an administrative officer of the hospital. Although originally closely tied to the Department of Rehabilitation Medicine, the SRHCP has slowly grown away from it. The SRHCP Coordinator still submits a copy of the program's annual report to the head of the Rehabilitation Medicine department who, in turn, acts as a medical advisor to the home care program.

There is close cooperation between the SRHCP and the province's District Home Care Program. Since patients are frequently referred from one to the other, regular conferences are held which all team members of both programs attend. Each member gives a brief report on the patient from their perspective (e.g., from the viewpoint of a physiotherapist) so that all persons involved with that patient are kept up-to-date. As well, monthly meetings, at which future plans are discussed, are scheduled for the senior staff of both programs and any problems which have arisen are resolved.

For patients to be accepted into the SRHCP, they must undergo an assessment by a rehabilitation assessor. These people employed by the SRHCP are available to each of the three hospitals in Saskatoon (i.e. University Hospital, City Hospital and St. Paul's Hospital). They initiate referrals for rehabilitation services through consultation with hospital nurses, social workers, therapists and physicians. They also assess patients in the community who have been referred by a physician. Completion of a Rehabilitation Home Care medical form by the assessor

and family physician is required before a patient can receive any services.

Thus the SRHCP, started before home care was being considered as an alternative to hospital care, has become an established and integral part of the home health care service provided in Saskatoon. It is felt that the success of the program will ensure its continued existence and that other areas of the province may study the feasibility of incorporating certain aspects of the SRHCP into their programs.

CHAPTER III  
DRUG-RELATED PROBLEMS FACED BY PATIENTS

It seems so simple - the taking of a drug for an illness, either one prescribed by a physician or one purchased over-the-counter for self-medication purposes. However, there are many and varied problems associated with this act that are not immediately apparent. For the purposes of discussion these problems are divided into two broad categories:

1. Category I - those that are directly related to the patient and,
2. Category II - those that are directly related to the physician(s) prescribing the drug(s).

The first category encompasses such things as patient compliance with the medication regimen, self-medication with non-prescription drugs, adverse drug reactions, inappropriate methods of taking medication e.g., swallowing tablets or capsules without any liquid or chewing sustained release (i.e. Slow-K<sup>®</sup>) or enteric coated preparations (i.e. Entrophen<sup>®</sup>) prior to swallowing, consumption of outdated over-the-counter (OTC) or very old prescription drugs and the practice of "multi-doctoring" i.e. the patient seeing and obtaining prescription medication from more than one physician without the physicians involved being aware this is happening.

The second category also involves the "multiple doctoring" problem as well as the prescribing of duplicate medications, the lack of close monitoring of laboratory values (e.g., serum potassium while on digoxin and/or diuretics with subsequent drug dosage modification if required) and the lack of monitoring of the medications being taken by the patient - including both the drugs and the length of time the patient has been receiving them.

## 1.0 Category I: Problems with Medication that Directly Involve the Patient

### 1.1 COMPLIANCE

#### 1.1.1 INTRODUCTION

The term, "compliance", has different meanings depending in what context it is used. However, from a pharmacy standpoint, a compliant patient is defined as one who follows the instructions that are provided regarding the use of medication (Hussar, 1975).

Both physicians and pharmacists tend to assume that patients will take a medication as instructed since it has been prescribed to improve and/or maintain a patient's health. Therefore, why would a patient be noncompliant? Studies continue to show that many patients - for a variety of reasons - do not take their medications according to instruction (Hussar, 1975). Most studies show that at least one-third of all patients will fail to follow instructions with respect to the proper consumption of medication and some studies indicate that the rate of non-compliance exceeds 50% (Stewart and Cluff, 1972; Boyd *et al.*, 1974; Welk *et al.*, 1974).

#### 1.1.2 CONSEQUENCES of NON-COMPLIANCE

The consequences of non-compliance may be either detrimental or beneficial to the patient. Detrimental results of inappropriate use of medications include a progressive worsening of the condition being treated, increased risk of adverse drug effects as a result of polypharmacy, use of prescription drugs by patients for whom they were not prescribed and accidental or intentional poisonings owing to stockpiled medication. In a minority of cases, non-compliance may actually be beneficial, allowing a patient to avoid adverse drug reactions and possibly subsequent hospitalization (Cluff, 1985).

An important consideration with respect to non-compliance is its impact on health care expenditures. Although this is very difficult to ascertain, one method that has been used by

researchers is the measurement of the number of hospital admissions due to adverse drug reactions. The major problem with this approach is that not all adverse reactions result from noncompliance. Stewart and Cluff (1972) report that adverse drug reactions are the seventh most common cause of admissions to one of the medical services at Johns Hopkins Hospital. Gryfe and Gryfe (1984) estimate 3% - 5% of hospital admissions are the result of adverse drug reactions. According to Levy *et al.* (1979), 27% of hospital admissions could be avoided by a more careful choice and dosage of drug.

Drug-related illnesses are estimated to cost \$2 billion annually in the United States - a cost which reflects expenses due to hospital admissions (Cluff, 1985). Although adverse drug reactions often result in the patient's requiring hospitalization, one must be careful in assigning a dollar value to such happenings. Many adverse drug reactions are unpredictable or unavoidable. Most studies on adverse drug reactions have been carried out at university hospital settings and admissions to these facilities are quite different from those in the thousands of other U.S. hospitals.

A Canadian study undertaken in 1971 showed that failure to continue medications while ambulatory (i.e. patients who were non-compliant) accounted for approximately 25% of readmission due to congestive heart failure during a 1 year period at Sunnybrook Medical Centre in Toronto (Canada, 1974).

In summary, a patient who is non-compliant runs a risk of treatment failure which can lead to retreatment, additional treatment or hospitalization. All lead to the same outcome - an increase in health care costs. In fact Tidball (1981) estimates that if only 20% - 30% of prescription drugs in British Columbia are not taken as prescribed, waste through the government supported prescription payment plan would amount to between \$12 and \$20 million annually. Thus if each pharmacist in British Columbia prevents only one drug-related hospital

admission per month, the annual savings for government could be in the area of \$12 million (based on hospital costs of approximately \$200 per patient per day and an average stay in hospital for a patient being 8 days and longer).

### 1.1.3 THE NONCOMPLIANT PATIENT

In order to predict the likelihood of a patient being noncompliant, efforts have been made to demonstrate the relationship of noncompliance to a number of variables such as age, sex, religion, race, marital status, education, occupation, socioeconomic status, personality factors, types and severity of illnesses. Although certain patterns have been noted in some studies, the results, in general, have been inconsistent (Hussar, 1975). Since an uncooperative type of patient cannot be identified, every patient should be viewed as a potential defaulter. In no case should compliance be assumed. A number of risk factors for noncompliance have been identified by researchers (Blackwell, 1973):

1. chronic illnesses that require long-term therapy
2. certain age groups i.e. children and the elderly
3. patients living alone
4. psychiatric illness or personality disturbances
5. number of drugs taken and the frequency of administration (The risk of non-compliance increases as these increase.)
6. side effects (The development of side effects is a deterrent to compliance.)
7. attitude to physician (Patients are more inclined to comply with the instructions of a physician that they know well and respect.)

#### 1.1.4 FACTORS AFFECTING COMPLIANCE

The ultimate decision as to whether or not medication will be taken as prescribed rests with the patient. Several factors either singly or in combination have the potential to influence a patient's decision-making process (Table I).

##### 1.1.4.1 Failure to comprehend the importance of therapy

According to the health belief model quoted by Becker and Maiman (1975), patients will comply when they believe that the illness is serious, that they are potentially vulnerable, that the recommended therapy reduces risks and that there are few difficulties in undertaking the recommended action. For a patient to make this decision, they must have knowledge about their disease, how drug therapy affects it and the potential consequences if the medication is not used as directed. Without such information, patients will establish their own ideas and objectives with respect to the disease and their drug therapy. If therapy fails to meet their expectations, they are inclined to become noncompliant (Hussar, 1975).

One of the major reasons for noncompliance is that patients do not understand the reason for their prescriptions (Latiolais and Barry, 1969; Smith, 1976; Lundin, 1978). Forty percent of those patients who make medication errors are confused or have inaccurate knowledge about one or more of the medications they are taking (Schwartz *et al.*, 1962). Compliance is positively correlated with knowledge of the purpose of a medication (Boyd *et al.*, Part II, 1974; De Wet and Hollingshead, 1980). Thus evidence points to the conclusion that compliance and knowledge are closely linked and that the more information a patient possesses about his disease and his drugs, the better are the chances that he will be compliant. However, one must keep in mind that there is no guarantee that knowledge will result in improved compliance (Sackett *et al.*, 1975). Bartlett *et al.* (1984) summarizes the knowledge-compliance association as follows:



Table I  
Factors Contributing to Noncompliance

---

Failure to comprehend the importance of therapy  
Poor understanding of the instructions  
Multiple drug therapy  
Frequency of administration  
Duration of therapy  
Adverse effects  
Fear of becoming drug dependent  
Lack of symptoms  
Cost of medication  
Unpleasant taste of medication

---

"Studies in the teaching-knowledge-adherence branch consistently have demonstrated a positive relationship of physician teaching to patient learning and recall. However, research on the relationship between knowledge of the regimen and adherence is less conclusive. *Observational* studies generally have found a positive correlation between knowledge and adherence. However, actual *intervention* programs have been less successful; of ten studies cited in one review, only one showed that increased knowledge improved adherence. One might deduce from these studies that while knowledge is a *necessary* condition for behavior change, it probably is not a sufficient condition, and that many other variables, such as a patient's motivation, social support, psychomotor skills and financial means also are important."

#### 1.1.4.2 Poor understanding of the instructions

There is little likelihood of patients being compliant if they are confused about basic prescription directions. Four percent of prescriptions are written with the designation for patient instructions being "as directed" (Powell *et al.*, 1973). For 38% of these prescriptions, the patient's understanding of the directions is different from that intended by the prescriber.

Even when directions are more specific, confusion can still occur. Frequent errors of interpretation occur even when the instructions are not ambiguous (Mazzullo *et al.*, 1974). For example, a prescription written for penicillin  $\theta$  to be taken "three times a day and at bedtime" meant to 90% of the patients that the drug should be taken with meals and at bedtime. Taken in this manner, a significant decrease in the drug's absorption could occur. When the instructions are designated as "30 minutes before meals and at bedtime on an empty stomach", 91% of the patients interpret them correctly. Hermann (1973) documents 15.5% of outpatients receiving prescriptions are unable to interpret a dosage schedule from the instructions provided or have only a vague idea of how to use the drug.

The possible consequences of some of these misunderstandings and misinterpretations

could be serious. Nothing should be taken for granted regarding a patient's understanding of how to use medication. A label reading "Take 1 tablet three times a day" could mean taking the drug every 8 hours, taking it with meals or taking it on some other schedule as long as three tablets are taken in one day. The more specific the directions, the less confusing it will be for the patient and the greater the likelihood that the patient will be compliant.

#### 1.1.4.3 Multiple drug therapy

The number of medications prescribed for a patient influences the extent of medication errors. The greater the number, the higher is the risk of noncompliance (Malahy, 1966; Latiolais and Barry, 1969). When three or more medications are prescribed compliance is significantly lower than when only one or two are prescribed (Francis *et al.*, 1969). For each new drug added to a medication regimen, the potential for error is more than doubled (Canada, 1974).

With multiple drug therapy, the similarity in appearance of certain drugs (e.g., both Lasix<sup>®</sup> 20 mg and Lanoxin<sup>®</sup> 0.25 mg are small white tablets) may contribute to a patient's noncompliance since the drugs can potentially be confused resulting in their incorrect use (Hussar, 1975).

Minimizing the number of tablets a patient must take by using combination drug products may help to improve compliance (Hussar, 1975). Once the optimal dosages of the individual drugs have been determined for a particular patient, a combination drug product may be selected if it contains the drugs in the required amounts.

#### 1.1.4.4 Frequency of administration

The use of an individual drug at frequent intervals can also contribute to patient

noncompliance. The more frequently that drug(s) must be taken, the more likely it is that the patient's normal routine or work schedule will have to be interrupted to take a dose of the medication. This fact often leads to a patient's forgetting the dose, not wanting to be inconvenienced or wishing to avoid embarrassment with the result being that the drug is not taken.

Hussar (1975) quoted an investigation that had been done which evaluated the frequency of administration of a single drug on compliance over a one-month period. The results showed:

1. *four times daily* - 70% failed to take 25-50% of the prescribed dose,
2. *three times daily after meals* - 60% failed to take 25-50% of the prescribed dose,
3. *twice daily* - 30% failed to take up to 25% of the prescribed dose, and
4. *once daily* - 7% failed to take up to 20% of the prescribed dose.

Thus it seems that drugs should be prescribed as few times a day as possible. Some must be given at frequent intervals to maintain desired blood and tissue levels but some can be given much less frequently than tradition dictates e.g., it is possible to give the daily dose of antidepressants at night rather than throughout the day.

#### 1.1.4.5 Duration of therapy

There is strong support for the widely held view that adherence to treatment decreases with time (Haynes, 1979). In acute, short-term illnesses, the proportion of noncompliant patients increases after seven days of prescribed treatment (Francis *et al.*, 1969). In chronic illnesses such as tuberculosis and hypertension, noncompliance increases as the duration of therapy increases. In one study of patients with tuberculosis, noncompliance increased from 18% during the first year to 66% during the fourth year (Luntz and Austin, 1960). Of patients

on antihypertensive drug therapy, only 17% followed their treatment regimens after 5 years (Caldwell et al., 1970)

Some evidence in the literature contradicts these findings. Porter (1969), in his study of short-term (125 days) and long-term (326 days) patients, showed that widespread noncompliance was not a problem in his patient population. Davis and Eichhorn (1963) found a similar pattern but their study population consisted of cardiac patients whose reported compliance rate may have been strongly influenced by symptom recurrence if medication was not taken as directed.

#### 1.1.4.6 Adverse Effects

If patients experience unpleasant side effects from a medication, it is unlikely that they will be compliant with that medication. One researcher noted that the development of impotence is a major reason for male patients to discontinue taking antipsychotic drugs (Marshall, 1971). Yet surprisingly, side effects do not occur frequently and when they do, patients do not often cite them as a reason for failing to take their medications (Haynes et al., 1977). However, the possibility of noncompliance being related to adverse drug effects must be kept in mind.

#### 1.1.4.7 Fear of becoming drug-dependent

Because of increased awareness and concern about becoming dependent on agents prescribed for legitimate medical reasons, patients often develop a fear of dependence regarding the use of any drug for a prolonged period (Hussar, 1975). To avoid such a possibility or to prove to themselves that they are not dependent, patients may interrupt or stop therapy or use the drug in smaller amounts.

#### 1.1.4.8 Lack of symptoms

It is extremely difficult to convince patients that they must take a medication if they are not experiencing any symptoms. For example, hypertensive patients often feel perfectly well without treatment and continue to do so even if treatment is stopped. Moreover, many antihypertensive drugs cause side effects which make the patient feel worse than he or she did prior to the initiation of therapy. These two facts together result in a high incidence of noncompliance in this group of patients (Caldwell *et al.*, 1970).

In other circumstances, patients may discontinue the drug because they feel better (i.e., they are symptom free). Often, this is the reason why a patient does not complete a course of antibiotic therapy. However, being symptom free does not necessarily mean that the patient is disease free.

Either way, the result is the drug may be stopped and the disease and the damage it causes may progress or an infection, for example, may relapse. Any of these consequences may lead to increased health care costs.

#### 1.1.4.9 Cost of the medication

When costs are high, patients may conserve drugs or fail to have prescriptions filled. In Saskatchewan, a government prescription drug plan is in effect whereby the patient only pays a part of the dispensing fee for many drugs. The 1985 regulations allow a pharmacist to set this fee at an amount not to exceed \$3.95 per prescription. Thus cost may not be a major factor in Saskatchewan unless a patient has several prescription medications to purchase whereby cost due to the dispensing fee alone can become significant (Heard, 1982).

#### 1.1.4.10 Unpleasant taste of medication

The problem of noncompliance due to the drug having a disagreeable unpleasant taste occurs mostly in, but is not limited to, children. Many adult patients are required to take potassium which is frequently prescribed in a liquid form. Due to its objectionable taste, patients may skip doses or discontinue the drug altogether without realizing the serious consequences which may result. Noncompliance with respect to the taking of potassium chloride liquid was pointed out in a study by Brook *et al.* in 1971 who showed that the compliance rate for this drug was only 60% as compared to 92% for digoxin and 83% for hydrochlorothiazide.

#### 1.1.4.11 Miscellaneous factors

Several factors other than those previously cited affect compliance. When patients experience a significant wait in getting to see their physicians or having their prescription order dispensed, their resulting annoyance may contribute to poor compliance (Geersten *et al.*, 1973). Adherence to a medication regimen is also influenced by patient satisfaction with the visit to the physician which in turn is determined by the *quality* of the physician's interpersonal skills and the amount of patient teaching (Bartlett *et al.*, 1984). Treatment outcome is enhanced by a doctor-patient relationship in which the patient is treated as a subject who perceives and evaluates situations, makes his own decisions and implements them (Heszen-Klemens and Lapinska, 1984).

The nature of a patient's illness may be another factor. Those with psychiatric disorders may be less cooperative than other patients (Hussar, 1975). One factor often overlooked is the possibility that a patient has vision impairment (Fedder, 1984). This occurs more frequently in the elderly age group. Prescription labels are often too small for these patients to read and differences in the colours of tablets may be confused (e.g., blue confused with violet; white

confused with light yellow). Both these problems can result in a patient being noncompliant.

Compliance, therefore, is a complex problem and when pharmacists, physicians or other health professionals attempt to deal with it, all the previously mentioned factors must be taken into account.

#### 1.1.5 WAYS TO IMPROVE COMPLIANCE

When patients leave the hospital or the physician's office with a prescription, they assume responsibility for their own care. As Cluff (1985) points out in his article dealing with patient compliance, health care professionals must ensure that the patients are motivated to assume that responsibility. Communication is the key here, communication between the patient and the physician, the patient and the pharmacist, and the physician and the pharmacist. Patients must be given thorough comprehensible information about their disease process, the drugs being prescribed and why a particular treatment regimen is necessary. Such information must be presented to the patient in a manner which can be understood and incorporated into a daily routine or compliance improvement is unlikely to be achieved (McKenney, 1981). It is not enough to give patients information which they may not understand or use. The patient must be "educated" and this implies patient understanding and behavioural change (Hussar, 1975). Patients should thus be encouraged to participate in the discussion, to ask questions, and to contribute to any decisions that are to be made with regard to their treatment regimen.

Verbal counselling with written reinforcement is generally considered to be one of the best methods of educating the patient (Smith, 1981). Written information allows a patient to refer back to what was discussed verbally. A patient cannot remember all that was said during one session with a pharmacist or physician. Patients can recall only approximately 50% of the information given them by the physician during an office visit (Heszen-Klemens and Lapinska,



1984). Verbal instructions plus either a calendar indicating each day's treatment or a card identifying each tablet and detailing the regimen significantly reduce the number of medication errors (Wandless and David, 1977). The highest level of compliance results from a patient-pharmacist intervention when the pharmacist verbally reviews the prescription label and a drug data sheet with the patient (Clinite and Kabat, 1976; Balderson, 1979). Thus verbal and written information should be used to complement each other as they are both important components of the effort to educate the patient regarding his drug therapy.

To provide the degree of understanding of the drug therapy that would encourage compliance patients should be provided with the following information (Hussar, 1975):

1. the name of the medication,
2. the general purpose of the medication,
3. the route by which the drug is to be administered and how to administer it,
4. the amount of drug to be taken as a single dose,
5. the timing and frequency of administration,
6. the maximum amount of drug that can be used in one day (as in the case of "prn" medications),
7. how long to use the medication (e.g., a patient should take the entire course of antibiotic therapy even if he feels better),
8. pertinent adverse effects, cautions and other information relating to the action of the drug (e.g., an ability to cause discoloration of the urine),
9. the need to avoid certain other drugs, food or activities (e.g., certain types of exercise),
10. the proper storage and handling of the drug, and
11. the renewal instructions.

Medication is often obtained in a manner that does not lend itself to verbal communication between the pharmacist, physician and patient. Examples of this are the many patients on home health care programs who do not visit the pharmacy in person to obtain their drugs. Instead they or their physician order the medications from the pharmacy by telephone and these are then delivered to or picked up by someone else for the patient. The education of the patient with respect to his medications becomes very difficult in this situation and many times is neglected completely.

Although the physician's role in minimizing noncompliance should not be underestimated, the pharmacist has a particularly valuable opportunity to encourage compliance since his advice accompanies the actual dispensing of the medication and he is the last health professional to see the patient prior to the time the medication is to be used (Hussar, 1975). Communication between patient and pharmacist should involve those points mentioned previously with respect to drug therapy. Other points to be discussed should include insuring the treatment regimen does not conflict or interfere with the patient's routine or life-style (Golden, 1984), inquiring if a patient has any concerns about his treatment regimen in general, and endeavouring to make the patient feel that he is a partner in his therapy and is just not "taking orders" from the physician or pharmacist without understanding the reason. The way to improve compliance is through motivating the patient.

#### 1.1.6 METHODS OF MEASURING COMPLIANCE

The measurement of compliance is very difficult. Although at first glance, it appears rather simple and straightforward, closer inspection shows the pitfalls that are inherent in such an undertaking. Leon Gordis (1979) has outlined several direct and indirect ways of measuring compliance (Table II).

Table II  
Methods of Measuring Medication Compliance

---

A. Direct

1. Blood levels
2. Urinary excretion of
  - a. medication
  - b. metabolite
  - c. marker (tracer)

B. Indirect

1. Therapeutic or preventive outcome
  2. "Impression" of physician (predictability)
  3. Patient interview
  4. Filling of prescription
  5. Pill count
- 

(Gordis, 1979)

Direct methods of measurement involving the actual detection of the drug, tracer or metabolite in body fluids are felt by many researchers to be the most accurate (Heard, 1982). However, technical and pharmacokinetic complications as well as patient acceptability and logistic difficulties may be encountered with such methods.

Indirect methods of measurement are usually more acceptable to the patient but are less accurate. Heard(1982) reviewed the literature and found the following:

1. physician impression is generally an inaccurate means of measuring compliance,
2. patient response or therapeutic outcome is also generally deemed to be a poor method because other things not related to medication compliance such as natural disease progression, drug resistance etc, may have a bearing on outcome,
3. patient interviews do have some merit in identifying noncompliers but they are not as reliable as a pill count,
4. pharmacy records of the intervals between filling prescriptions does not seem to be a good method of assessing compliance when compared to urinalysis, and
5. the pill count is generally considered to be a moderately accurate index of intake, although it is no where near being as good as urine or blood data.

Although the personal interview has the major disadvantage of reliance upon the patient to respond truthfully, it does however permit a more in-depth study of subtle types of errors (Boyd et al, 1974 Part I). The accuracy of such a personal interview may be improved by phrasing questions and conducting interviews in a manner that does not impose guilt upon the patient. In comparing verbal reports to dosage unit counts a discrepancy often exists, but accuracy is not seriously in error when noncompliance is large (Boyd et al., 1974 Part I).

Direct methods of compliance measurement seem to be the most accurate but the least convenient for the patient whereas the indirect methods are just the opposite.

### 1.1.7 SUMMARY STATEMENT ON COMPLIANCE

Considerable time, energy and expense are involved in a physician's diagnosing a patient's illness and developing his treatment program. However, the goals of therapy will not be reached if the patient is noncompliant for whatever reason. Certain approaches to improve compliance involve a significantly increased commitment of time on the part of physicians and pharmacists that may be viewed by some as impractical (Hussar, 1975). Yet can this compare with the commitment of time and expense that is presently wasted as a result of noncompliance?

### 1.2 NONPRESCRIPTION MEDICATIONS (OVER-THE-COUNTER or OTC MEDICATIONS)

Most drug-related problems that directly involve the patient could be categorized as lack of compliance. However, another area which deserves attention is the use of nonprescription medications or OTC's. Taking action about a particular symptom or about a generalized feeling of malaise depends first on the patient's recognition that something is abnormal or wrong, then on the decision that it is appropriate to do something about it. Patients then choose their course of action which may include consultation with their general practitioner, taking OTC medicines, seeking the help of chiropractors, herbalists or osteopaths or asking for advice from relatives and friends.

It is acknowledged that patients have the right to self-medicate and thus the potential to misuse that right exists. Although there has been speculation on the extent of abuse of nonprescription medicines by consumers, there has been little concrete data showing actual patterns of use. Because of this, Skinner in 1985 undertook a comprehensive review of consumer use of nonprescription drugs. An extensive 20 year computer search of the world's

literature by the National Research Council of Canada was initiated and revealed few in-depth studies on self-medication practices. For his article, Skinner used only the major studies found of sufficient sample size to be statistically representative.

He began with a study published in 1972 by Knapp and Knapp the results of which showed that during a 30-week period the average number of illness episodes was 12.4 per household. The most common illnesses were cold or cough (28.2%), minor pain and headache (18.7%), gastrointestinal tract problems (7.1%) and skin ailments or cuts (6.6%). Only a nonprescription drug was used to treat the ailment in over 60% of the cases, a doctor was consulted before any remedy was used in 12.3% and the problem was ignored in 7%.

Skinner (1985) in his review reported that following this in 1975, Rabin and Bush published a similar research article in which they had surveyed 3481 people in and around Baltimore. Their results closely agreed with those of Knapp and Knapp (1972). Pain relievers purchased without a prescription were used by 19.7% of the study population; 5.7% used cough/cold medicine; 4.9% used skin ointments; and 4.2% used stomach remedies. This study covered an entire year whereas the previous one was conducted during a shorter period which happened to be over the cough/cold season thus accounting for the difference in percentages seen for these drugs when comparing these two studies.

As well, Rabin and Bush found that as illness increased in severity, doctor-prescribed treatment increased, while self-treatment remained low therefore suggesting that patients tended to related minor illness to self-medication and more severe illness to professional care. The average number of nonprescription drugs used per illness was 1.4 - including vitamins; without vitamins, it became 1.1 (Bush and Rabin, 1976).

It is interesting to note the results of an international survey by Kohn and White and reported on by Skinner (1985). The rates of use for pain relievers, cough-cold, stomach

remedies (i.e., laxatives) and skin ointments are given in Table III. The most common OTC products used in Canada, the United States and Europe were ones for relief of pain. Thirty-three percent of nonprescribed medication was used on the suggestion of a physician.

Skinner (1985) mentioned that Freer in 1978 had conducted a survey on women's use of nonprescription medication which showed that of the 42% of the population that used some form of self-medication, 81% took nonprescribed drugs. Since women usually have higher rates of OTC drug use than men, the percentages could be expected to drop slightly if adjusted for this sex bias (Dunnell and Cartwright, 1972).

Skinner's review also quoted results from a 1981 Canada Health Survey. Of the people having a health problem and taking steps to deal with it, only 48% chose to use medications whereas the remaining 52% chose to rest in bed, limit their activities, or consult a health professional. When a reviewer looked more closely at the survey's collected data, it was found that of the 48% taking medication, 60% did so on the advice of a physician. This amounts to approximately 29% of the total population and agrees with the findings of Kohn and White (Skinner, 1985).

The survey also looked at the prevalence of an illness and selected behaviour of the consumer in response to it, over a 2 week period (Skinner, 1985). The results appear in Table IV. The high rate of drug use for stomach problems is probably due in large part to doctor-directed antacid use for ulcers and digestive disorders although consumers will still consume OTC drugs occasionally for upset stomach or heart burn.

In general, the Canadian survey indicated that OTC medications were used only occasionally and mostly by the under-65 adult population. Self-medication for arthritis formed a small percentage of use and fell entirely into the senior age group which implied nonprescription drug use on a physician-directed basis. Also, long-term self-medication with

Table III  
 Mean Rates of Adult Nonprescription Medicine Use

<u>Category of Medicine</u>	<u>% Using</u>	<u>Country Studied</u>
Pain reliever	38	Canada
	44	United States
	50	Europe
Cough/Cold	12	Canada
	11	United States
	13	Europe
Skin Ointments	16	Canada
	12	United States
	7	Europe
Laxatives	12	Canada
	12	United States
	8	Europe

(Skinner, 1985)



Table IV  
Prevalence of Illness & Selected Behaviour During a 2-week Period

Illness	Prevalence of problem (%)	Response (%)		
		No action or -limit activity	Drug Use	Professional Contact
Headache	4.3	70.6	30.7	4.1
Acute respiratory	3.1	63.5	26.9	35.1
Influenza	2.7	84.8	14.5	29.7
Hayfever/Allergy	8.5	91.3	4.3	5.6
Stomach Problems	2.7	24.8	73.2	13.7
Skin Disorders	8.1	59.1	36.4	7.1

(Skinner, 1985)

laxatives was prevalent in persons over the age of 65 years, but interestingly enough, the survey showed that this group self-medicated with laxatives to a lesser degree than did other adults. Chronic use of laxatives in this older group appeared to be doctor-directed.

Skinner (1985) summarized some of the important aspects of studies done to date in Canada, the United States, Europe, the United Kingdom and Australia:

1. Illness in all areas of the world is extremely common (75% of the population will feel ill sometime in any given month). In this instance, illness or ill health was defined as any perceived health problem by the consumer such as headache, minor muscle pain, rash etc.

2. The vast majority of symptoms do not receive medical attention (85% of illnesses are not seen by doctors).

3. Slightly less than one half of all illnesses receive any treatment.

4. About 60% of those who use drugs use a nonprescription product. Since, in the presence of illness, about 50% of people on average are treated, and 60% of those remaining used nonprescribed products, about 30% of ill people self-medicate with nonprescription drugs.

5. Over 90% of nonprescribed medication is used appropriately.

More recently (1984), a consumer survey of self-medication was carried out by Heller in the United States involving 2049 respondents. Skinner (1985) reviewed his findings and gave a summary of them:

1. Adults use OTC drugs to treat 33% of their illnesses;

2. 81% of consumers prefer to fight symptoms due to illness without taking medication;

3. 96% know that medication should be taken only when absolutely necessary;

4. 95% agree that one should be careful when using OTC drugs; it is not safe to take as

many nonprescription drugs as one wishes, and people not only should, but do read instructions before taking these drugs for the first time.

5. 78% agree that if they are at all unsure about a situation, they would not self-medicate but call a doctor.

6. The average problem is treated with 1.09 nonprescription products.

Skinner's review article (1985) concluded with the preliminary results of a pilot study done by the Federal Health Protection Branch on patterns of nonprescription drug use in Canada (1980). The conclusions of this study were:

"Based on an objective evaluation of whether or not nonprescription drug consumption was 'proper' or 'improper' with respect to indication and/or dose, the results suggested that the level of nonprescription drug misuse is low, at least for the five drug categories studied." (These categories were analgesics, cough/cold remedies, mouth and throat preparations, laxatives and stomach remedies.)

The findings indicated that nonprescription misuse was so low that any serious abuse probably would not be detectable without a very large sample size.

In summary, then, it appears that nonprescription drugs are generally viewed by consumers as an effective and inexpensive way of managing particular symptoms. Misuse of these medications is very small and on the whole, consumers are responsible in their attitudes toward illness, gauging their reactions according to its severity and nature. A major reason for the proper use of OTC drugs is that much information is on the label i.e., indication for use, recommended dosage (often including a daily maximum), and storage instructions if needed.

Even with results of all studies to date showing this lack of misuse, the pharmacist should not neglect his duty of counselling patients on the purchase of nonprescription medication. There are still potential problems which may be averted by this practice (Smith and

Sharpe, 1984). Examples of some of these include:

1. problems associated with the use of the OTC drug (e.g., gastrointestinal bleeding with acetylsalicylic acid);
2. adverse effects caused by concomitant use of nonprescribed and prescribed drugs (e.g., interference with absorption of antibiotics caused by antacids); and
3. excessive use of one group of drugs (e.g., analgesics, laxatives).

Because consumers have considerable autonomy in the area of nonprescription drugs, they must have the knowledge to enable them to make an informed decision on self-medication.

### 1.3 METHOD of TAKING MEDICATION

Failure to take one's medication properly is one component of compliance. However, an aspect of this that deserves attention is the practice of patients' swallowing tablets and capsules without liquids. This may result in the development of painful inflammation and ulceration of the esophagus. Dr. Wilfred Weinstein, professor of medicine at the University of California-Los Angeles gave this warning at a seminar held in conjunction with the American College of Gastroenterology's annual scientific meeting in Toronto in 1984 (Anon., May 1985). Apparently, 200 cases of esophagitis have been officially attributed to ingestion of medication but Dr. Weinstein believes the actual incidence is much higher. Teenagers on long-term antibiotic regimens for acne and elderly people are at highest risk. Teenagers tend to take medication quickly, often without enough liquid. The elderly have a slower esophageal transit time than younger patients. All patients compound the risk of esophagitis by taking medication immediately before bedtime; when lying down they don't have the help of gravity to ensure the medication reaches the stomach and does not lodge in the esophagus.

Health professionals often overlook this aspect of medication administration when

informing patients about their drugs. Not all patients need some sort of liquid in order to be able to swallow a tablet or capsule. Thus it becomes extremely important for patients to be warned of the danger involved in not using a liquid to wash down their drugs. Dr. Weinstein suggests patients take medication with fluid, in an upright position and at least 30 minutes before meals.

## 2.0 Category II: Problems with Medications that Directly Involve the Physician(s)

### Prescribing the Drug(s)

Once the medication has been prescribed by the physician, the onus is on the patient to have the prescription filled and to take the drug as directed. If the patient is noncompliant, effective treatment becomes extremely difficult, especially if the physician is unaware of the patient's actions.

Although it is the patient who determines if the therapeutic regimen outlined by the physician will be followed, patients have no control over whether the correct drug and/or the correct dose were prescribed, whether they actually need that medication or whether they are being monitored by the physician closely enough. These factors fall into the physician's jurisdiction (i.e., diagnosing, prescribing, monitoring and adjusting therapy).

Few research studies have dealt with this category of problems. Comer (1985) reported on documentation of pharmacists' interventions with respect to medication-related problems undertaken in a 1000-bed hospital in the United States. Of the 383 pharmacist-initiated changes in drug therapy including both recommendations for changes and identification of errors made, 3.4% were prescribing errors by physicians. These involved an incorrect dose being prescribed in 8 instances, an incorrect drug being prescribed in 3 and an incorrect dosing interval being prescribed in 1 case. Although this study was carried out in a hospital, it is reasonable to assume that similar findings might occur in community practice. Coe, Prendergast

and Psathas (1984) conducted a literature review during which they found two articles dealing with physician performance and iatrogenic illness. One of these studies showed that 36% of 815 elderly patients admitted to a hospital developed an iatrogenic illness, 40% of which were due to medication errors. The other study showed that errors of this type were due to lack of knowledge on the part of the physician.

After looking at prescribing practices in elderly patients admitted to a hospital during a one month period, Gozney and Tallis (1984) found 200 prescriptions which should not have been written. Of these, 7 were for drugs to which the patient had previously reacted adversely, 60 were for drugs that were contraindicated in the patient's condition and 133 were for drugs that were likely to have adverse reactions. In their conclusion, the authors made this observation:

"When the volume of drug information and the adverse, distracting circumstances in which much prescribing takes place are considered, it is scarcely surprising that physicians do not always remember what they know."

Another potential physician-related drug problem centres around the tendency of many physicians to add another drug if a patient shows a poor response or to repeat prescriptions for patients without taking the time to determine if the patient still needs the medication. Blackwell (1973) suggested that one reason for the former was the physician's reluctance to ask the patient about compliance. However, it is imperative that the physician take the time to discuss, not only compliance, but also the patient's illness, the need for treatment and the likely consequences of both. It is imperative that the physician take the time to review a patient's drug regimen before renewing prescriptions and to inquire about the nonprescription drugs that patient may be taking. The responsibility for having any necessary laboratory tests performed is also the physician's. For example, serum potassium levels should be routinely monitored in

patients taking both diuretics and digoxin.

Although the physician controls the above mentioned factors, the pharmacist can be a valuable asset to the physician. The pharmacist may often be aware, even when the physician is not, of the OTC drugs a patient is taking, of a possible adverse reaction due to a drug prescribed for a particular patient, of symptoms described by a patient that could be side effects of a drug, of a prescription being refilled for years and of a patient seeing several physicians simultaneously without their knowledge in order to obtain more of a particular drug (e.g., diazepam). Sharing such information with the physician results in improved patient care.

Not all drug-related problems are under the direct control of the patient and some can only be solved by consultation with the physician(s) involved.

## CHAPTER IV

### PURPOSE OF THE STUDY

#### 1.0 The Problems

Ways of improving patient care which are also cost-effective are always being sought. Home health care is one of these ways. It has been proven to decrease the length and cost of a patient's stay in hospital, as well as providing the patient with a familiar environment in which to recover or to maintain his health. An area not closely looked at as yet is pharmacy service to the home care patient. Many patients in a home health care program are too ill or not sufficiently mobile to pick up their medications at the pharmacy in person resulting in the loss of opportunity for the pharmacist to converse with and educate patients about their drugs. Also, although home health care patients have several specialized services such as occupational therapy, physiotherapy, social service and nursing available to them through the home care program, pharmacy as yet has not been regarded as an integral part of this team of professionals. Is this because there is no need or is it because the need has just not been identified?

Few studies have focused on the home health care patient resulting in there being a lack of a large database on which to draw or base comparisons among different home health care patient populations. For this reason, further research is needed dealing specifically with the role of the pharmacist in the home health care system. The Saskatoon Rehabilitation Home Care Program (SRHCP) identified such a need approximately six years ago but, because of lack of funding, did not pursue a study. At that time, concern was expressed over the number of medications that some patients were taking and it was felt that the expertise of a pharmacist was required. Another area for concern was that patients who were first admitted to the SRHCP had a



medication history and current list of what they were taking prepared by the Rehabilitation Assessor. After that, no one in the SRHCP kept track of the patient's medications and therefore, what a patient should or should not be consuming with respect to drugs. Many patients are in the program for months or even years during which time medications and dosages change. The only persons who know what that patient is currently taking are the patient, the pharmacist from whom the patient buys his drugs and the patient's physician. However, the patient may deal with more than one pharmacy and/or see more than one physician who prescribes medication for the patient, leaving the patient as the sole authority on his medication regimen. In many cases, the patient will be able to reliably list the name of the drug(s) being taken and the strength plus the directions for use. In many other instances, the patient cannot do this whether due to forgetfulness or to confusion as to what drugs he or she is supposed to be taking, or will not because of a deliberate intent to conceal noncompliance with medication regimens. If home care is in fact a modified extension of hospital care into the patient's home, then medication supervision should be part of this service. In what form and by whom this should be done is yet to be ascertained.

Thus home health care patients need to be studied in order to discover if they face problems related to medication usage which differ from those faced by other patients. Also, such studies may help to answer the question, "Is there a place for a pharmacist as a full-time member of the home care team?".

## 2.0 Objectives of the Study

In an attempt to address some of these questions, this research project was designed with the following objectives in mind:

1. to collect data of a general nature which could be used to detect any drug-related problems faced by patients in the Saskatoon Rehabilitation Home Care program.
2. to provide an assessment of the number of drug-related problems faced by study patients and to determine what factors influenced the number of problems listed for the patient
3. to assess patients' compliance using a noninvasive or indirect method and to determine what factors influenced their compliance.
4. to determine if there were any differences between those patients <65 yr and those 65 yr & over with respect to the number of drugs being taken, the number of prescription drugs for which the patient knew the name and knew the use, patient compliance and the number of drug-related problems listed for the patient.
5. to assess the need for and possible role of a pharmacist in the home health care team.

## CHAPTER V

### METHODOLOGY

#### 1.0 Study Population

In order to perform a pre-test of the original questionnaire (Appendix I), ten patients were chosen by Saskatoon Rehabilitation Home Care (SRHC) personnel from among the patients registered in the SRHCP during October 1984. The criteria for selection were:

1. that the patient was taking medication and was perceived by SRHC personnel during routine visits as needing assistance with this aspect of their treatment regimen, and
2. that the patient was willing to participate in the study.

The sample population to whom the revised questionnaire (Appendix II) was administered was chosen from among the 432 patients registered in the SRHCP in January 1985. One hundred and seventy patients were chosen with the expectation of obtaining the cooperation of approximately 85 or 50%; this 85 would be 20% of the study population of 432 patients. A random number table (Diem & Lentner, 1970) was used to choose the 170 patients. All of the 432 patients, except the ten who had taken part in the pre-test of the questionnaire, were eligible for the study.

#### 2.0 Study Design

##### 2.1 APPROVAL of STUDY DESIGN

Approval for the study was given by both the University of Saskatchewan President's Advisory Committee on Ethics in Human Experimentation and the Coordinator of the Saskatoon Rehabilitation Home Care Program.

## 2.2 DEVELOPMENT of the QUESTIONNAIRE

The questionnaire was designed to be administered to the patient during a personal interview. The questions were both "open-ended" and "closed-ended" ( i.e., the patient was required to give a definite answer to each question). The areas covered by the questionnaire included:

1. patient's age, sex and race
2. patient's living arrangements (Did the patient live alone or with another person or persons?)
3. patient's diagnosis
4. length of time patient had been in the SRHCP
5. number of medications including prescription and nonprescription ones that the patient was taking
6. name, strength and directions for use of these drugs (This information was taken directly from the prescription vial.)
7. patient's knowledge of the name, strength and directions for use of the drugs plus knowledge of possible side effects, storage instructions, what to do if a dose was missed and any precautions to observe while taking the drug(s)
8. assessment of patient compliance based on information provided by the patient
9. person(s) from whom patients would request information about their drugs
10. number of pharmacies with which the patient dealt and the method by which the patient obtained his medication
11. number of physicians whom the patient was and had been seeing and whether the patient had prescriptions from more than one physician
12. the reason cited by patients for choosing to use a particular nonprescription drug

and where that drug was purchased

The pre-test of the original questionnaire resulted in its separation into two parts, the first to be administered during the patient interview and the second to be completed after the interview. This modification was made to simplify the interview process since much of the questionnaire could be completed later using the information obtained during the interview. As no problems were encountered with patient responses, no questions were changed.

### 2.3 PATIENT CONTACT

The selected 170 patients were sent a letter (Appendix III) in March 1985 explaining the interview and requesting their cooperation. Within a time period of 10 -21 days, these patients were contacted by telephone and either agreed or refused to participate. There was no pressure placed on the patients at any time to enter the study. For those patients who indicated their willingness to be a part of the study, an appointment for the interview was made.

### 2.4 ADMINISTRATION of the QUESTIONNAIRE

A personal interview was conducted with each patient during which the questionnaire was administered. All interviews were handled by the author. Immediately after each patient session, the author completed the questionnaire in its entirety utilizing the data gathered during the interview process. Also, at that time, the author's personal comments were recorded concerning any problems that the patient was facing with respect to his or her medications.

## 2.5 DATA ANALYSIS

For each patient's questionnaire, the answers were coded by the author onto Opscan sheets for data analysis. The data was analyzed using the SPSS-X program package (SPSS Inc., Chicago, Illinois) on a DEC-20 computer. Frequencies of responses were tabulated for all questions. Relationships between variables were examined by nonparametric correlation (Spearman's rank correlation coefficient reported as a value labelled "r") or chi-square analysis. Probability values less than 0.05 were considered statistically significant.

## CHAPTER VI

## RESULTS

A letter (Appendix III) was sent to 162 patients out of the 170 randomly selected from the study population. Between January 1985 when the 170 patients were selected and March 1985 when the letters were sent, 8 patients either deceased or moved away from Saskatoon leaving only 162 to whom letters were finally mailed. Seventy-four patients (45.7%) agreed to take part in the study and were administered the revised questionnaire during a personal interview. There were a variety of reasons for this low "response rate". Five patients of the original 162 patients died between the time the letter was sent and the patient was contacted. Three letters could not be delivered and fifteen patients could not be reached by telephone subsequent to the letter. A minimum of 5 telephone calls were made in an attempt to reach patients. Of the patients who were actually contacted by telephone, 45 refused to be interviewed without giving any specific reason, 12 said that they were not feeling well enough to take part, 6 could not be interviewed because they were in hospital and 2 gave other reasons.

### 1.0 Demographic Variables

#### 1.1 SEX

Of the initial 162 patients chosen, 58 (35.8%) were male and 104 (64.2%) were female. The groupings on the basis of sex in the 74 patients finally interviewed were 24 (32.4%) male and 50 (67.6%) female. The overall census for patients registered in the SRHCP in 1983/84 were 459 males and 604 females or 43.2% and 56.8% respectively based on the patient total of 1063.

## 1.2 AGE

The ages of the patients interviewed are outlined in Table V. The largest group (33.8%) consisted of patients between 70-79 years of age while 20.3% of the patient population was 80 years old and over. A large proportion of patients (45 out of 74 or 60.3%) were elderly (i.e., 65 years and older). The overall census for patients registered in the SRHCP in 1983/84 showed that 5.8% were 20-29 years, 5.1% were 30-39 years, 5% were 40-49 years, 10.9% were 50-59 years, 19.8% were 60-69 years, 26.4% were 70-79 years and 22.1% were 80 years and older.

## 1.3 DIAGNOSES

The number and type of diagnoses for each patient was recorded on the questionnaire (Table VI, Appendix IV). Thirty-four patients (45.9%) had only one diagnosis; 22 (29.7%) had two; 11 (14.9%) had three; 4 (5.4%) had four; 2 (2.7%) had five; and 1 (1.4%) had six. Most patients (i.e., 67 patients or 90.3%) had three or less diagnoses.

Analysis of the list of diagnoses for each patient indicated that 37 patients out of a total of 74 (50%) had a cardiovascular disease (hypertension, congestive heart failure, cerebrovascular accident, angina, myocardial infarction or a cardiac arrhythmia); 15 of 74 (20.3%) had a pulmonary disease (chronic obstructive pulmonary disease, cystic fibrosis or asthma); 31 of 74 (41.9%) had arthritis (osteoarthritis or rheumatoid arthritis) or a bone-related disorder (degenerative disc disease, osteoporosis); and 10 of 74 (13.5%) had a neuromuscular disease (multiple sclerosis, paraplegia, quadraplegia).

## 1.4 ALLERGIES

When asked whether they were allergic to any medication, 22 patients (29.7%)



Table V

## Ages of Patients Interviewed (Displayed in Groups)

Age (in years)	Number of Patients	% of Patients
Less than 20	0	0
20 - 29	3	4.1
30 - 39	2	2.7
40 - 49	4	5.4
50 - 59	13	17.6
60 - 69	12	16.3
60-64	7	9.5
65-69	5	6.8
70 - 79	25	33.8
70-74	15	20.3
75-79	10	13.5
80 and above	15	20.3
Total	74	

Table VI

Number of Patients Recorded as Having a Specific Diagnosis

Number of Patients	% of Patients	Diagnosis
16	21.6	Hypertension
15	20.3	Congestive Heart Failure
14	18.9	Chronic Obstructive Pulmonary Disease
11	14.9	Rheumatoid Arthritis
11	14.9	Osteoarthritis
9	12.2	Diabetes Mellitus
7	9.5	Cerebrovascular Accident
4	5.4	Multiple Sclerosis
4	5.4	Glaucoma
3	4.1	Hypothyroidism
3	4.1	Angina
3	4.1	Arteriosclerotic Heart Disease
3	4.1	Central Nervous System Disorder
3	4.1	Para/Quadra-Plegic
2	2.7	Myocardial Infarction
2	2.7	Osteoporosis
2	2.7	Cardiac Arrhythmias

answered in the affirmative. Examples of drugs implicated in producing allergic reactions included penicillin, disopyramide and codeine. Only true allergies were counted; side effects of drugs, although classed by the patient as an allergy, were not included (e.g., gastrointestinal upset due to acetylsalicylic acid).

#### 1.5 LIVING ARRANGEMENTS

Twenty-five patients (33.8%) lived alone; 25 (33.8%) lived with their spouse only; and 24 (32.4%) lived with someone else, either family members or nonrelated persons.

#### 1.6 HOME CARE HISTORY

Patient records maintained by the Saskatoon Rehabilitation Home Care personnel were used to determine when patients were first admitted into the program, whether they had been registered on a continuous basis since the first admission and the length of time that patients had been receiving home care services either continuously or sporadically. This time period was calculated from the date of first admission to the date of the patient interview.

Thirty-two patients (43.2%) had been in the rehabilitation home care program continuously since they had been admitted. The remaining 42 (56.8%) had been registered intermittently in the program (i.e., they would receive home care services, be discharged from the program and later be readmitted as their condition required).

The length of time that a patient had been in the program, either continuously or intermittently varied considerably (Table VII). The largest number of patients (36 patients or 48.6%) had been on the program for more than six months but not more than two years. Seven patients (9.5%) had been with home care for longer than 5 years.

Table VII

## Time Since Patient First Admitted into the SRHCP

Time	Number of Patients	% of Patients
0 - 2 months	2	2.7
3 - 6 months	9	12.2
>6 mo.- 1 yr.	17	23.0
>1 yr.- 2 yr.	19	25.6
>2 yr.- 3 yr.	8	10.8
>3 yr.- 5 yr.	12	16.2
>5 yr.	7	9.5
Total	74	100.0

## 2.0 Prescription Medications

### 2.1 NUMBER of PRESCRIPTION DRUGS PATIENTS WERE TAKING

Four patients (5.4%) did not take any prescribed medication while 44 (59.5%) took between one and four drugs each. Six patients (8.1%) took 8 medications and 4 patients (5.5%) took 9 or more (Appendix V).

### 2.2 NUMBER of PRESCRIPTION DRUGS FOR WHICH NAME AND STRENGTH WERE KNOWN

Participants in the study were asked if they could give the names and strengths of the prescription drugs they were taking without referring to the labelled containers. Four patients (5.4%) had made a list knowing they could not remember. Because 4 patients did not take prescribed drugs and 4 patients had a list made, this left 66 patients on whom the following results were based. Of those who did not have a list prepared, 16 (24.2%) could not name any of the drugs which had been prescribed for them and which they were currently taking. Fifty patients (75.7%) knew the name of one or more of their prescription drugs. Forty-five patients out of the 66 (68.2%) could not give a strength for any of their prescribed medication (Appendix VI).

For each patient, the percentage of prescription drugs for which the patient knew the name and the strength was calculated. Although sixteen patients did not know the names of any prescription medication they were taking, 20 patients (30.3%) knew all the names (100%). Seventeen patients (25.8%) knew the names of 50%-77% of their prescription drugs. Only 8 patients (12.1%) knew the strength of all their prescription medications.

In order to compare the results between younger and older patients, the patient population was divided into those <65 yr (24 patients) and those 65 yr and older (42 patients). In the first age group, 6 patients (25%) knew 0-40% of their prescription drug names and 10

patients (41.7%) knew 80-100% compared to 17 patients (40.5%) and 13 patients (31%) respectively in the elderly group.

### 2.3 EXPIRY DATES and PRESCRIPTION DRUGS

None of the prescription medication taken by 49 patients (70%) had an expiry date listed on the prescription container. In those instances where an expiry date did appear, only one medication was found to be outdated. Of a total of 292 prescription drugs being taken by all patients, only 27 or 9.2% had an expiry date listed on the container (Table VIII).

### 2.4 LENGTH of TIME PATIENTS HAD BEEN TAKING THEIR PRESCRIPTION MEDICATION

Of the 292 prescription medications being taken, 25 (8.6%) had been taken for less than 30 days, 86 (29.5%) had been taken for more than 30 days but not longer than one year and 174 (59.6%) had been taken for over a year (Appendix VII).

### 2.5 NUMBER of PRESCRIPTION MEDICATIONS NOT BEING TAKEN by the PATIENT

The number of prescription drugs not being taken by the patient at present included those drugs which had been prescribed for the patient but which the patient was not taking due to various reasons. Fifty-three patients (75.7%) reported taking all of the drugs prescribed for them; 13 (18.6%) said they took all but one; and 4 (5.7%) said they took all but two. Examples of the drugs and the reasons given by the patients for not taking them included:

1. antibiotics prescribed for a patient with chronic bronchitis but which the physician told the patient to take only if a cold or chest infection developed,

2. diuretics prescribed but the patient had been directed to take them only if there was ankle swelling,

Table VIII

## Number of Prescription Drugs Found to Have an Expiry Date

---

Number of Drugs		
with expiry date	Number of Patients	% of Patients
0	49	70.0
1	17	24.3
2	2	2.9
3	2	2.9
	Total	70

---

3. medications which a patient had decided not to take any more without a physician's knowledge (e.g., One patient stopped his Ventolin<sup>®</sup> tablets because he felt that they were no longer needed after his physician prescribed a Ventolin<sup>®</sup> Inhaler), and

4. other medications taken by a patient only infrequently on an "as needed" basis but which did not specify this on the prescription label (e.g., One patient had a prescription for indomethacin which he only took if he had an attack of gout. The prescription was labelled in such a way as to indicate that it was to be taken regularly; no mention was made of gout on the label).

## 2.6 NONCOMPLIANCE & REASONS GIVEN for NONCOMPLIANCE

### 2.6.1 NUMBER of PRESCRIPTION MEDICATIONS with which PATIENTS are NONCOMPLIANT

The prescription medications for which a patient was recorded as being noncompliant in this section included those which the patient took in a manner differently from that stated on the prescription label and those for which the patient admitted to frequently missing doses.

Forty-five patients (64.3%) said they were compliant with all their prescription medications but 12 (17.1%) admitted noncompliance with at least one drug, 10 (14.3%) with two drugs and 3 (4.3%) with three or four drugs. In other words, 25 patients said they were noncompliant with one or more drugs.

Of these 45 patients who said they were totally compliant, 14 were less than 65 years of age and 31 were 65 years and older (elderly). The 14 patients represented 51.9% of the under 65 yr. group whereas the 31 patients represented 71.1% of the elderly age group indicating that the older patients were more compliant with their medications than the younger ones.

### 2.6.2 REASONS for NONCOMPLIANCE

Frequently forgetting doses of a prescription drugs was given as a reason for



noncompliance by 5 patients (20% of the 25 patients who had admitted noncompliance). Ten patients (40%) stated that they took the medication prescribed differently from the label directions because their physician had verbally instructed them to do so. The rest of the noncompliant group gave various other reasons for their failure to take the medication as directed. For example, one patient was supposed to be using Ventolin<sup>®</sup> Respirator Solution on a regular basis but had decided to temporarily discontinue its use because he felt well. Another patient had prescriptions for both Dyazide<sup>®</sup> and Lasix<sup>®</sup> to be taken daily. The physician had prescribed a month's supply of Lasix<sup>®</sup> and the patient wisely had decided not to take the Dyazide<sup>®</sup> at the same time.

Focusing on the medication-taking procedures followed by patients allowed noncompliance to be studied from a different angle. Patients were asked if they ever took more than or less than the prescribed dose either at one time or on a daily basis. If they answered "no" to each of the five questions in this section, they were termed *compliant* with all their prescribed drugs. This method showed that only 35 patients out of the 70 actually taking one or more prescription medications were compliant. Thus, between the two indirect ways of attempting to produce a measure of compliance, there was a discrepancy of 10 patients, the first measure giving a number of 45 compliant patients and the second measure giving 35 patients as being totally compliant. Detailed results from the second method of compliance measurement revealed the following:

1. Four patients (5.7% of 70 patients) admitted to taking more than the prescribed dose of one drug at any one time.

2. Five patients (7.1%) admitted to taking more than the prescribed dose per day of one drug and 1 patient (1.4%) said he did this for two of his prescription medications. The reason most frequently cited by these patients (5 out of the 6) for this behaviour was the belief

that an extra dose was needed.

3. Taking less than the prescribed dose at any one time of administration was reported by 6 patients (8.6% of 70). Of these six, three stated their reason as believing they did not need the drug anymore and three gave other reasons.

4. The largest number of patients (i.e., 31 patients) fell into the category of those taking less than the prescribed daily dose of a drug. Eighteen patients (25.7%) said they did this for at least one prescription medication; 9 (12.9%) admitted this happened for two of their drugs; and 3 (4.3%) admitted it for three drugs. One patients said that on a daily basis she took less than she was supposed to of six medications.

Eleven of these 31 patients gave their reason as feeling that the drug was no longer needed and had discontinued its use, at least temporarily. Three patients said that they just forgot doses and 16 others reported different reasons and combinations of reasons.

## 2.7 STORAGE of PRESCRIPTION MEDICATION

Only three patients had stored a prescription medication improperly. Each of these three had a problem with only one of their prescribed drugs meaning that 3 prescription drugs out of 292 (1%) were not stored as recommended by the manufacturer.

## 2.8 PATIENTS' KNOWLEDGE of WHAT their PRESCRIPTION DRUGS ARE FOR

Patients were asked if they knew why the physician had prescribed a particular medication and what it was supposed to do. The responses were categorized as being fully correct, partially correct, believing they knew but were incorrect and admitting they did not know (Appendix VIII).

Important points to note from this data are:

1. Forty-one patients (58.5%) knew the correct use of between one and three of their prescription drugs; four patients (5.7%) could not give a correct use for any of their prescribed medications.

When the percentage of prescribed drugs for which a correct use was known was calculated for each patient, the results showed that 40 patients (57.1%) knew the correct use of all of their prescription medications; 11 patients (15.7%) knew the use of between 51% & 90%; and 10 patients (14.3%) knew the use of 50%.

2. Twenty-four patients (34.3%) were only partially correct in their knowledge of what one or two of their drugs were for.

3. Three patients (4.3%), for at least one drug each, believed they knew why they were taking the drug but were incorrect.

## 2.9 PATIENT KNOWLEDGE of WHETHER to ADD CERTAIN FOODS or to AVOID CERTAIN DRUGS or FOODS WHEN TAKING PRESCRIPTION MEDICATIONS

Patients were asked during the interview if they had been told to avoid certain drugs or foods or to add certain foods to the diet while taking any of their prescription medications. Patients who responded with a "no" were not counted. Those who answered in the affirmative were coded on the questionnaire in the "yes" category if their information was correct and in the "no" group if incorrect.

Only 12 patients (17.2%) had any information about possible interactions with their prescription medications and of these, only one had incorrect information.

## 2.10 PATIENT KNOWLEDGE of WHAT TO DO if a DOSE of MEDICATION is MISSED

Patients were asked what they would do if they missed a dose of their medication. If a

patient answered that he or she never missed a dose, this was counted as the patient not knowing. Forty-two patients did not know the correct procedure to follow for any of their drugs if a dose was missed (Table IX).

#### 2.11 PRESCRIPTION DRUGS AND SIDE EFFECTS

Patients were asked if they had ever had side effects from any prescription drug. Forty-eight (65.8%) said they had not; 20 (27.4%) reported experiencing side effects from one prescribed medication; 3 (4.1%) implicated two drugs; and 2 patients (2.7%) said that they had experienced adverse effects with three drugs. Thus side effects had been a problem for 25 patients out of the 74 interviewed.

In no case did patients state that they had discontinued the medication without the physician's knowledge because of side effects. In most instances, the physician switched the patient to another drug.

#### 2.12 PRESCRIPTION DRUG INFORMATION

Of the 74 patients interviewed, 71 responded to the questions concerning prescription drug information. Four patients were not taking any prescription drugs. Of these four patients, one volunteered his experiences when he had been receiving prescribed drugs and so was counted as a respondent.

Out of 71 patients, 39 (54.9%) stated that they had never been given information with respect to their prescription drugs. Of the 32 patients (45.1%) receiving information, the type of information that patients reported being given most often included the name of the drug, the purpose of the drug, directions for its administration and possible side effects. In a few instances, proper storage of the medication was mentioned plus information on refilling the

Table IX

Patient Knowledge of What To Do if a Dose of Prescription  
Medication were Missed

---

	<u>Number of Patients</u>	<u>% of Patients</u>
Patient correct for all his/her prescription drugs	21	30
Patient correct for some	7	10
Patient does not know what to do for any of his/her prescription drugs	<u>42</u>	<u>60</u>
Totals	70	100

---

prescription (Appendix IX)

Although thirty-two patients said they received information on their prescription drugs at some point in time, there were only 31 patients who named a source of this information; one respondent could not remember from whom the information had been received. The pharmacist was most often named as being the source of information. The source indicated with the second highest frequency was the physician (Table X).

Although no formal question was posed to the patients being interviewed with respect to needing information on any of their drugs, 12 out of the 74 (16.2%) asked the interviewer for specific answers regarding one or more aspects concerning the medication they were taking.

### 3.0 Nonprescription or OTC (Over-the-Counter) Medication

#### 3.1 NUMBER OF OTC MEDICATIONS TAKEN BY PATIENTS

Fifty-four patients out of 74 (73%) were taking one or more OTC drugs. Three (4.1%) were taking 8 and one patient was actually taking 10 drugs (Appendix IX). The average number of nonprescribed medications per patient in each of two age groups (Group 1= <65 yr ; Group 2= 65 yr and >) was calculated to be 1.7 and 2.3 respectively.

#### 3.2 TYPE of OTC TAKEN

The following percentages were derived from responses by the 54 patients who were taking a nonprescription drug. Six patients (11.1%) took only an analgesic but thirteen (24.1%) took an analgesic plus at least one other OTC medication. Cough and cold drugs alone were taken by 5 patients (9.3%); laxatives only, by 4 (7.4%); and vitamins only, by 6 (11.1%). Nine respondents (16.7%) said they took a laxative as well as other OTC's with 3 of

Table X

## Source of Prescription Drug Information Named by Patients

Source	Number of Patients	% of Patients
Pharmacist	17	54.8
Physician	6	19.4
Pharmacist & Physician	5	16.1
Pharmacist & Other	1	3.2
Nurse (Home Care)	1	3.2
Other	1	3.2
Total	31	

the 9 taking a laxative in combination with an analgesic (Appendix X)

### 3.3 NUMBER of OTC'S for WHICH NAME & STRENGTH WERE KNOWN

Study participants were asked if they could give the names and strengths of the nonprescription drugs they were taking without looking at the labelled containers. Only one patient had made a list of her OTC drugs; of the 53 others not having such a list, 7 (13.2%) could not name any of the nonprescribed drugs they were taking; 32 (60.4%) knew the names of all (100%) their OTC drugs. Thirty-three patients (62.3%) indicated they did not know a strength for any of their OTC's (Appendix XI).

### 3.4 EXPIRY DATES & OTC DRUGS

Of a total 154 nonprescription drugs being taken by all patients, 120 or 77.9% had an expiry date listed on the container (Appendix IX & Appendix XII). Only two patients had an outdated OTC product (i.e., only two OTC drugs out of 120 or 1.7% were outdated).

### 3.5 NUMBER of NONPRESCRIPTION MEDICATIONS NOT BEING TAKEN BY THE PATIENT

Because over-the-counter drugs are designed for patient self-medication, they are very often used on an intermittent rather than on a regular basis. For example, a patient may have a nonprescription analgesic on hand but may only use it when a headache develops. On the other hand, people who purchase vitamins tend to take them more regularly.

Twenty-eight of the 54 patients (51.9%) taking OTC drugs reported that they took all of them regularly; 19 (35.2%) said they took all but one and 7 (13%) said they took all but 2 on a regular basis.



### 3.6 STORAGE of NONPRESCRIPTION MEDICATION

Four patients had stored their nonprescription medication improperly. Two out of these four patients had stored one drug incorrectly whereas two patients each had stored two drugs incorrectly. This meant that a total of six OTC medications out of 154 (3.9%) were not stored as recommended by the manufacturer.

### 3.7 PATIENTS' KNOWLEDGE of WHAT THEIR NONPRESCRIPTION DRUGS ARE FOR

#### 3.7.1 NUMBER of PATIENTS WHO KNEW THE REASON THEY WERE TAKING EACH OTC DRUG

Patients were asked the reason why they were taking each nonprescription drug and what they believed it was supposed to do (Appendix XIII). Three patients (5.6%) had no idea what any of their OTC medications were for. The other 51 (94.4%) knew the use of one or more of their drugs; 48 of these 51 patients knew the use of all (100%) of their nonprescribed drugs.

#### 3.7.2 NUMBER of PATIENTS USING AN OTC DRUG FOR A RECOMMENDED PURPOSE

Even though patients may have been able to give a reason why they were taking a certain nonprescription drug product (i.e., state the use of that drug), this use may or may not have been one for which the product was officially recommended. Claims which are scientifically unsubstantiated seem to abound in publications and often patients will decide to use an OTC medication based on these.

In the study population, 50 patients used one or more of their OTC drugs for a purpose that was listed in the scientific literature (Appendix XIV). Upon expressing the number of nonprescription drugs used for an officially approved purpose as a percentage of the number for which a use was stated, 41 patients out of this 50 quoted an approved use for all (100%) of their OTC medications. One patient did not use any of his OTC drugs for an officially approved

indication.

Of the 154 nonprescription drugs being taken in total, 112 of them (72.8%) were used by patients for a recommended purpose.

### 3.8 NUMBER of OTC DRUGS FOR WHICH A RECOMMENDED DOSE IS BEING USED

Manufacturers of nonprescription drugs state the recommended dosage for each product on the container label. To determine if patients followed these recommendations, they were asked how much of the medications they took and how often. This was then compared to the directions on the manufacturer's label. Only one patient did not take any of his drugs as was recommended. Fifty-three others (98.1%) followed the label directions for one or more of their nonprescribed drugs (Appendix XV). Of 154 nonprescription drugs being taken by all patients, 149 (96.7%) were taken by patients in an officially approved dose.

### 3.9 HOW PATIENTS DECIDE TO TAKE OTC DRUG PRODUCTS

A patient's decision to take a nonprescription medication may be influenced by many factors (Table XI). Fourteen patients (25.9%) stated that they began taking a nonprescription drug on the advice of their physician and sixteen (29.6%) said their decision was based on other factors. The "other factors" included the patient's reading an article or a book which recommended a particular OTC product for a specific condition or the patient's being advised to take such a product by a person selling vitamins, minerals and herbal remedies (e.g., employees of health food outlets). Thus physician advice and "other" factors were the two major events influencing patients on their decision to use and choice of a nonprescription drug.

Although advertising alone did not seem to be a major influence on OTC use, it appeared to play a role in combination with other factors. Advertising alone, advertising plus the input of a

Table XI

## How Patients Decided to Take an OTC Medication

Influencing Factor(s)	Number of Patients	% of Patients
Pharmacist *	0	0.0
Physician*	14	25.9
Friend*	2	3.7
Advertising*	2	3.7
Other*	16	29.6
Professional Person** +Friend	5	9.3
Professional Person + Advertising	7	13.0
Professional Person + Other	6	11.1
Friend + Advertising	2	3.7
Total	54	

\* In each of the categories ( i.e., pharmacist, physician, friend, advertising), patients responded with only one answer when asked how they decided to take an OTC drug.

If they responded with more than one answer, they were counted in one of the combination categories (e.g., friend + advertising).

\*\* Professional person includes a physician, a pharmacist and/or a nurse.

professional person (pharmacist or physician) and advertising plus the input of a friend affected the decision of 11 patients (20.4%).

### 3.10 WHERE PATIENTS PROCURE OTC DRUGS

In order to determine where patients shopped for nonprescription drug products, the survey included a specific question regarding this issue (Table XII). The majority of patients (34 or 63%) purchased their nonprescription drugs at a pharmacy. Sixteen percent (9 patients) purchased them at other outlets, primarily grocery stores which were chosen because of cheaper prices. The category labelled "other" encompassed persons selling vitamins, minerals, herbal products and related items on an individual basis (e.g., Shaklee representatives).

### 3.11 OTC DRUGS & SIDE EFFECTS

Patients were asked if they had ever experienced side effects from any OTC drug. Sixty-four (92.8%) said they had not; 4 (5.8%) reported experiencing side effects from one OTC medication; and one patient (1.4%) named two drugs which had caused adverse effects. Thus side effects from OTC drugs had been a problem for a total of 5 patients.

### 3.12 DRUG INFORMATION REQUESTED BY PATIENTS DURING THE INTERVIEW

During the course of the 74 interviews, four patients (5.4%) asked for information with respect to nonprescription medication. The most common questions were those dealing with the identity or use of the OTC product and drug interactions.

Table XII

## Where Patients Get Their OTC Medications

Outlet	Number of Patients	% of Patients
Pharmacy	34	63.0
Other Outlets	9	16.7
Pharmacy + Other outlets	6	11.1
Other	3	5.6
Pharmacy + Other	2	3.7
Total	54	

#### 4.0 Other Information

##### 4.1 MEDICATION TAKEN WITH FOOD OR LIQUID

Two patients out of the 74 interviewed (2.7%) took medication WITHOUT any food or liquid, even a sip of water.

##### 4.2 MULTIPLE DOCTORING INFORMATION

###### 4.2.1 NUMBER OF PHYSICIANS SEEN BY PATIENT

When asked if they went to see more than one physician, 53 patients (71.6%) answered "yes" and 21 (28.4%) said "no". The second physician was often a specialist to whom the patient had been referred by the family doctor. However, some patients said they sought the advice of another physician on their own and for their own satisfaction. All except 2 of the 53 patients who admitted to seeing more than one doctor stated that the doctors involved knew that the patients were seeing another physician.

###### 4.2.2 PRESCRIPTIONS - FROM MORE THAN ONE PHYSICIAN

Twenty-six patients (35.1%) had prescription medications from more than one physician. All 74 patients were asked if they made sure to tell each physician they saw what drugs they were taking. Thirty-eight (51.4%) of the 74 said they told the physicians involved; 8 (10.8%) said they did not; and there were 28 (37.8%) who could not answer "yes" or "no". These included the 21 patients who did not see another doctor and to whom the question was irrelevant. Of interest were the other 7 patients who assumed that the physician would automatically know what they were taking.

#### 4.2.3 NUMBER OF PHARMACIES WITH WHICH PATIENTS DEAL

Of 74 patients, 60 (81.1%) bought their prescriptions at one pharmacy only. Fourteen (18.8%) dealt with more than one.

#### 4.3 PERSON WHOM PATIENT ASKS IF INFORMATION ON DRUGS IS REQUIRED

Only 73 patients responded to this question; the one person whose response was not recorded said he just did not know whom he would ask for drug information.

Sixty-four patients (87.7%) named the physician as the first person they would contact if they had any problems with their medications. Only 7 (9.6%) said they would call the pharmacist first. One patient stated that he would talk to his home care nurse before doing anything else and another said that whether he contacted the physician or the pharmacist first would depend on the seriousness and the urgency of the question.

#### 4.4 ASSISTANCE IN REMEMBERING MEDICATION

Nine patients (12.2%) said that someone helped them to remember to take their drugs and seven patients (9.5%) used some reminder system for this purpose, usually a pill container divided into compartments. Thus the majority of patients relied entirely on themselves and their memory to take their medications as directed.

#### 4.5 METHOD USED BY PATIENTS TO GET THEIR MEDICATION

Patients were asked if they obtained their medications from the pharmacy in person, by having someone pick the drugs up for them; by having them delivered or by using a combination of these options (Table XIII). Twenty patients (27%) relied on some other person to pick up their drugs for them all of the time; 8 patients (10.8%) had their drugs delivered all of the

Table XIII

## Method by Which Patient Gets Medication from the Pharmacy

Method		Number of Patients	% of Patients
In person	(1)	14	19.0
Has them delivered	(2)	8	10.8
Someone picks up medications	(3)	20	27.0
Combination of (1) & (2)		12	16.2
Combination of (1) & (3)		14	18.9
Combination of (2) & (3)		4	5.4
Combination of (1)&(2)&(3)		2	2.7
	Total	74	



time; 32 patients (43.2%) used a combination of methods. Only 14 patients (19%) went to the pharmacy in person to pick up their drugs.

#### 4.6 TIME FOR INTERVIEW

The average time for an interview to be conducted was 35.8 minutes with the range being 15 minutes to 90 minutes (Appendix XVI).

#### 4.7 DRUG-RELATED PROBLEMS FACED BY PATIENTS

##### 4.7.1 TOTAL NUMBER OF DRUG-RELATED PROBLEMS RECORDED FOR PATIENTS

Twenty-two patients (29.7%) out of 74 were perceived by the interviewer to have NO drug-related problems (Table XIV). The remaining 52 patients faced between one and three problems. It is to be noted that the patients usually did not realize any problem was present.

##### 4.7.2 NUMBER OF PROBLEMS DIRECTLY RELATED TO THE PATIENT

Of the 52 patients facing a drug-related problem, 45 (86.5%) had one or more problems classes as patient related. More specifically, 33 patients had one patient-related problem, 10 had two and 2 had three problems.

Examples of the type of problems classed as patient-related included a patient discontinuing a prescription drug without the physician's knowledge, taking more than the prescribed dose of a drug (e.g., overusing a Ventolin<sup>®</sup> Inhaler), misusing "prn" medication (e.g., using an hypnotic on a regular basis rather than intermittently as prescribed) and missing frequent doses of a drug which was prescribed to be taken regularly.

Table XIV

Total Number of Drug-Related Problems Recorded for Patients

Number of Problems	Number of Patients	% of Patients
0	22	29.7
1	27	36.5
2	15	20.3
3	10	13.5
	Total	74

#### 4.7.3 NUMBER OF PROBLEMS DIRECTLY RELATED TO THE PHYSICIAN

Of the 52 patients facing a drug-related problem, 23 (40.4%) had a problem which directly involved the physician. The type of problems that were included in this category involved those over which the patient had no control and which would have to be resolved by consultation with the physician. Eighteen of these 23 patients were classed as having one such problem and five patients as having two.

Examples of those problems classed as physician-related included inadequate control of a patient's pain resulting in that patient taking more than the prescribed dose of analgesic(s), continuous renewal of an hypnotic prescription for more than six months resulting in the patient being addicted to the medication and changing the prescription directions through direct communication with the patient without notifying the pharmacy resulting in confusion as to the correct directions.

### 5.0 Analysis of Selected Data Using Nonparametric Correlations & Chi-Square Analysis (Appendix XVII)

#### 5.1 RELATIONSHIP BETWEEN "COMPLIANCE" & SELECTED VARIABLES

One of the objectives of the study was to ascertain the compliance of patients with their medication regimens. The initial approach was to use a "pill count" but this was abandoned due to complicating factors. Therefore, "measures" of a patient's compliance were indirectly determined from the collected data using two different approaches and were labelled Method I and Method II.

The questionnaire was organized to allow the author to write down the exact directions for taking the medication as stated on the prescription label and then to give the patient the

opportunity to describe how he or she really took the drug. Comparison of the information obtained allowed the author to determine if a patient took the medication as directed on the prescription label with respect to the number of tablets or capsules taken each time and the frequency with which the drug was taken. From this, patients could be labelled as noncompliant with one or more of their medications although they had not directly admitted noncompliance. Included in this assessment were those instances in which the patient said that the drug was being taken differently from the prescription directions because the physician had told the patient to change. Although patients may have been compliant with the new directions, they were coded as noncompliant by the above mentioned criteria. The percentage of prescription drugs for which the patient was noncompliant was then calculated. Using this method (called Method I), 25 patients out of 70 (35.7%) were labelled noncompliant while 45 patients (64.3%) were compliant with all their drugs (see Section 2.6 for full results).

Also during the patient interview, each patient was asked if he or she "ever" took more than or less than the prescribed dose of a drug either at one time or on a daily basis. There were five questions covering different categories of noncompliant behaviour and the number of prescription drugs that fell into each category were recorded, a "zero" meaning that no drugs were in the category. The number of "zeros" recorded for each patient were counted. This number could be 0 to 5 with the degree of compliance increasing as the number of "zeros" increased. Patients who had "zeros" in all categories were those who were taking all of their drugs as directed (i.e., compliant with 100% of their prescribed medication). The rest were noncompliant with at least one of their medications. Using this method for ascertaining compliance (called Method II), 35 patients out of 70 (50%) were noncompliant with at least one of their drugs and 35 (50%) were compliant with all their medications.

Although these two methods of compliance measurement did not produce exactly the same

numbers of compliant/noncompliant patients, the correlation between the two was highly significant using Spearman's rank correlation test [ $r = -0.765$ ,  $p < 0.001$ ].

In determining what factors affected compliance in this study, both compliance measures were examined (Table XV). The important points to be noted are:

1. No significant correlation existed between either measure of noncompliance and patient age or number of diagnoses.
2. Both measures of noncompliance were significantly correlated with the percentage of prescription drugs taken according to label directions (i.e., with respect to both frequency of administration and number of tablets/capsules taken each time).
3. Noncompliance (Method I only) was significantly correlated with:
  - a. the number of drug-related problems faced by the patient (As the percentage of prescription drugs for which a patient was noncompliant increased, the number of patient problems increased.),
  - b. the time since the patient was first admitted to the home care program (The longer the time period since the patient was registered in the home care program, the greater the percentage of drugs for which a patient was noncompliant.), and
  - c. the number of prescription drugs taken by the patient (As the number of drugs increased, the percentage of drugs for which the patient was noncompliant increased.).
4. Noncompliance (Method II only) was significantly correlated with the percentage of drugs for which the patient knew the use (The greater the number of drugs for which the patient knew the use, the greater the degree of compliance.)

To examine the relationship of compliance and other patient attributes by chi-square analysis, patients were classified into two groups – compliant and noncompliant. To be classified as compliant the patient had to be taking all of his prescription medications correctly. A

Table XV

## Correlation Between Compliance (Method I &amp; Method II) and Selected Variables

Variable	Method I	Method II
Total number of drug-related problems faced by patients	p = 0.035 r = .2530	p = 0.412 r = - .0968
Time since patient first admitted to home care program	p = 0.013 r = .2970	p = 0.143 r = - .1733
Number of prescription drugs patient is taking	p = 0.001 r = .4016	p = 0.067 r = - .2138
Percentage of prescription drugs taken according to label directions (with respect to frequency)	p < 0.001 r = - .6556	p < 0.001 r = .7466
(with respect to no. of tabs/caps. taken per time)	p < 0.001 r = - .4153	p < 0.001 r = .6394
Patient age	p = 0.183 r = - .1609	p = 0.300 r = .1221
Number of diagnoses	p = 0.387 r = .1050	p = 0.564 r = .0682
Percentage of prescription drugs for which patient knows use	p = 0.343 r = - .1150	p = 0.043 r = .2421

patient's living arrangements (divided into either living alone or living with another person or persons) had no bearing on a patient's compliance and neither did the method by which a patient obtained his prescription drugs from the pharmacy (divided into two groups - those who picked up their drugs in person and those who had them delivered or picked up by someone else). The proportion of elderly patients and young patients who were noncompliant was not significantly different.

## 5.2 RELATIONSHIP BETWEEN the NUMBER OF DRUG-RELATED PROBLEMS FACED by PATIENTS & SELECTED VARIABLES

A significant correlation was found between the number of drug-related problems faced by a patient and:

1. the number of diagnoses listed for a patient [ $r=0.352$ ,  $p=0.002$ ]. (As the number of diagnoses increased, so did the number of drug-related problems.)
2. the number of prescription drugs being taken by a patient [ $r=0.459$ ,  $p<0.001$ ]. (As the number of prescribed drugs increased, the number of drug-related problems increased.)
3. patient compliance with their medication regimen [ $r=0.253$ ,  $p=0.035$ ]. (As the percentage of drugs with which a patient was noncompliant increased, the total number of drug-related problems faced by the patient increased.)

The number of drug-related problems was not significantly correlated with:

1. patient age,
2. the time that the patient had been registered in the home care program,
3. the number of OTC drugs being taken by a patient,
4. the percentage of prescription drugs for which a patient knew the name, and
5. the percentage of prescription drugs for which the patient knew the use.

### 5.3 RELATIONSHIP BETWEEN KNOWLEDGE of PRESCRIPTION DRUGS & SELECTED VARIABLES

The percentage of prescription drugs for which patients knew the name and the percentage for which they knew the use were taken to be indicators of the knowledge possessed by patients regarding their prescribed medications.

#### 5.3.1 PERCENTAGE of PRESCRIPTION DRUGS FOR WHICH the PATIENT KNEW THE NAME & SELECTED VARIABLES

The correlation between the percentage of prescription drugs for which the patient knew the name and the following variables were significant:

1. the percentage of prescription medication for which the patient knew the strength [ $r=0.421$ ,  $p<0.001$ ]. (As the percentage of drugs for which the patient knew the name increased, the percentage of drugs for which the patient knew the strength increased as well.)

2. the percentage of prescription drugs for which the patient knew the use [ $r=0.293$ ,  $p=0.017$ ]. (As the percentage for which the patient knew the name increased, the percentage for which the use was known increased.)

3. the percentage of prescription drugs which the patient had taken for more than 1 year [ $r=0.439$ ,  $p<0.001$ ]. (As the percentage of prescription drugs taken for more than 1 year increased, the percentage for which the name was known increased.)

4. the time since the patient had first been admitted to the home care program [ $r=0.26$ ,  $p=0.037$ ]. (The longer patients had been in the program, the greater the percentage of their prescription drug names the patients knew.)

No significant correlation was shown between this variable and :

1. the number of prescription drugs being taken by the patient ,



2. the number of diagnoses listed for the patient, and

3. the percentage of prescription drugs which the patient took according to label directions (with respect to frequency and number of tablets/capsules taken per time) which was really an indicator of patient noncompliance.

#### 5.3.2 PERCENTAGE of PRESCRIPTION DRUGS FOR WHICH the PATIENT KNEW the USE & SELECTED VARIABLES

Those variables correlated with the percentage of prescription drugs for which the patient knew the use and which have not been mentioned previously were:

1. the number of prescription drugs taken by a patient [ $r = -0.335$ ,  $p = 0.005$ ]. (As the number of drugs a patient was taking increased, the percentage of these for which the patient knew the use decreased.)

2. the percentage of prescription drugs for which the patient knew the strength [ $r = 0.35$ ,  $p = 0.004$ ]. (As the percentage of drugs for which the strength was known increased, the percentage for which the patient knew the use increased.)

No significant correlation was found between this variable and:

1. the time since the patient was first admitted into the home care program and
2. the percentage of prescription drugs which the patient had taken for more than 1 year.

#### 5.4 RELATIONSHIP BETWEEN the NUMBER OF NONPRESCRIPTION DRUGS BEING TAKEN BY THE PATIENT & SELECTED VARIABLES

The number of nonprescription medications taken by a patient was not significantly correlated with any of the following:

1. the number of prescription medications taken by the patient,
2. the number of diagnoses listed for a patient, and
3. the age of the patient.

#### 5.5 RELATIONSHIP OF SELECTED VARIABLES TO AGE

One of the objectives of this study was to examine the relationship of age to certain variables and in the process, to determine if differences existed between those patients <65 years and those 65 years & older.

There was a positive correlation between age and the number of diagnoses [ $r=0.344$ ,  $p=0.003$ ] but there was no relationship between age and:

1. the number of prescription medications which a patient was taking;
2. the number of OTC drugs a patient was taking (see Section 5.4),
3. the time since the patient was first admitted into the home care program,
4. age (divided into patients <65 yr and 65 yr and older) and the percentage of prescription drugs for which patients knew the use (grouped as 0-40%, 40.1-79.9%, 80-100%) [ $p=0.591$ ], and
5. age (divided into patients <65 yr and 65 yr and older) and the percentage of prescription drugs for which the patient knew the name (grouped as 0-40%, 40.1-79.9%, 80-100%) [ $p=0.435$ ].

In order to determine if there was any difference between those patients less than 65 years of age and those 65 years and older with respect to the number of drugs being taken (both prescribed and nonprescribed) and knowledge of their prescription drugs, a two-tailed "t" test was performed. No significant difference was found between the two age groups in the following

areas:

1. the number of prescription drugs being taken by the patient ( $p=0.174$ ),
2. the number of OTC drugs being taken ( $p=0.358$ ),
3. the percentage of prescription drugs for which the patient knew the name ( $p=0.847$ ), and
4. the percentage of prescription drugs for which the patient knew the use ( $p= 0.202$ )

#### 5.6 MISCELLANEOUS RELATIONSHIPS

There was a significant correlation between the number of prescription drugs being taken by the patient and the number of diagnoses listed for that patient [ $r=0.486$ ,  $p<0.001$ ]. (As the number of diagnoses increased, the number of prescription drugs increased.)

## CHAPTER VII

## DISCUSSION

1.0 Introduction

The data gathered using the questionnaire included a wide range of information which related to problems or potential problems with medication facing patients in the Saskatoon Rehabilitation Home Care Program.

In any discussion of drug-related problems faced by patients, the issue of compliance must be considered. In this study, compliance of patients with their drug regimen was to be determined initially using the "pill count" method. There were many problems encountered in trying to use this method. The number of tablets or capsules dispensed was often not recorded on the prescription label and would have necessitated going to each pharmacy involved to obtain this information. Other complicating factors included those instances in which both husband and wife were taking the same drug and would use each other's prescription until both prescriptions were due to be refilled. Thus it was decided to measure compliance indirectly by using other data from the questionnaire rather than using the "pill count".

As outlined in Section 5.1 of Chapter VII, two different approaches to compliance determination were used. Method I was a measure of the percentage of prescription drugs for which a patient indirectly admitted noncompliance on a "regular" basis such as frequently missing doses, taking the medication differently from that stated on the prescription label (often due to physician's verbal instructions to do so) and taking more medication than prescribed because the patient felt it was needed. Method II was a measure derived from the set of five questions which asked if a patient "ever" took more or less than the prescribed dose, at any one time of administration or over a 24 hour period.

Using Method I, 25 patients out of the 70 taking prescribed medication (35.7%) were classified as noncompliant whereas using Method II, 35 patients (50%) were noncompliant. By definition, Method I gave a measure of compliance based on patients' admitting that on a "regular" basis, they did not take the drug as directed on the prescription label. Method II, however, was a more "precise" measurement of noncompliance since patients were asked if they "ever" missed a dose or "ever" took more than the prescribed dose. The majority of patients probably miss a dose of medication on occasion; it is unrealistic to expect otherwise. Whether this should be considered as noncompliance is debatable. Because of the different ways in which a measure of compliance can be generated, it becomes of the utmost importance for each researcher to clearly define how the measure used was determined. Only in this way can results from different studies dealing with compliance be compared.

Because Method I was felt to represent a more realistic measure of a patient's compliance, it was chosen over Method II as the compliance measure to be used in this study.

## 2.0 Prescription Drugs & Drug-Related Problems

Most of the drug-related problems associated with prescription drugs centre around the issue of patient compliance.

### 2.1 MULTIPLE DRUG THERAPY

The more drugs that a patient takes, the more likely that patient is to be noncompliant (Malahy, 1966; Latiolais & Barry, 1969; Francis et al., 1969; Canada, 1974). A study conducted by Latiolais and Barry (1969) included 180 patients, 77 of whom misused their medications and the remaining 103 of whom took their drugs correctly. The group who misused their medications took an average of 2.3 drugs/patient whereas those who used their drugs

correctly took an average of 1.8 drugs/patient. In the present study of 74 patients, there were 70 who took prescription medication with the average number of drugs per patient being 4.2. This result parallels the findings of a study of home care patients conducted by Solomon *et al.* in 1978 showing an average of 5 drugs per patient. Also, the present study found noncompliance (Method I) to be positively correlated with the number of prescription drugs being taken by the patient [  $p < 0.001$  ]. Thus the greater the number of drugs prescribed for a patient, the higher the risk of a patient being noncompliant.

## 2.2 FAILURE TO COMPREHEND the IMPORTANCE of THERAPY

Failure to comprehend the importance of therapy is another risk factor for noncompliance. Knowledge of the disease process and the medication regimen used in the treatment is necessary for a patient to realize the importance of following the treatment plan (Latiolais & Barry, 1969; Smith, 1976; Lundin, 1978; de Wet & Hollingshead, 1980).

Knowing the names of the prescription drug(s) being taken, their strength(s) and their use(s) should be considered basic information for understanding the disease and the drug treatment involved. However, it is surprising to note in different studies, how many people do not have such knowledge. In one study of 180 patients, the group using their drugs correctly knew the names of 30.6% of their medications whereas the group misusing their drugs (77 patients) knew only 17.4% (Latiolais & Barry, 1969). Of two studies dealing with home care patients, one found that only 9% of the 46 patients in the study knew the drug name (Solomon *et al.*, 1978) and the other reported that only 8% of the prescription medications were correctly identified by the patient as to the proper name (Cooper *et al.*, 1985). The results of the present study differed from these in that 20 patients (30.3%) knew the names of all their prescribed medication and 16 patients (24.2%) did not know the names of any. This increased number of

patients knowing the names of all of their drugs may reflect a more interested group of home care patients than those in the study by Solomon *et al.* (1978). Another possibility is that more attention is being given to patient education by pharmacists and physicians because of the emphasis on spiralling health care costs and the addition being made to such costs by the noncompliant patient.

As to the patients' knowing the use of their prescribed drugs, varying results have been reported. Of 46 home care patients in one study, 53% did not know the purpose or use of any of their drugs (Solomon *et al.*, 1978). One study of patients 60 years and older showed that 59 out of 300 persons (8.4%) identified incorrectly or could not identify the correct use of their prescription drugs (Smith & Sharpe, 1984). In the present study, only 4 patients (5.7%) could not give a correct use for any of their drugs and 3 patients (4.3%) gave an incorrect use for at least one of their drugs. There were actually 40 patients (57.1%) who knew the correct use of all of their prescription medication.

The present study also showed that as the percentage of drugs for which the patient knew the name increased, the percentage for which the patient knew the use increased [ $r = 0.293$ ;  $p = 0.017$ ]. This probably reflects an overall increase in the drug knowledge possessed by the patient. Patients who make an effort to learn more about their medications would be expected to remember more drug names and uses.

Of interest is the lack of a statistically significant relationship between the percentage of prescription drugs for which the patient knew the use and compliance (Method I). Although the more knowledge patients have about their medications, the more likely they are to be compliant, there is no guarantee that knowledge will lead to improved compliance (Sackett *et al.*, 1975; Bartlett *et al.*, 1984)

Also as the number of prescription drugs taken by a patient increased, the percentage of

drugs for which the patient knew the use decreased [ $r = -.335, p = 0.005$ ]. It would seem that the more drugs with which patients are forced to cope, the less likely they will be to know the use.

### 2.3 NONCOMPLIANCE WITH or MISUSE of MEDICATION

One important area for discussion is patient misuse of medication. How many patients are noncompliant and what are their reasons for noncompliant behaviour?

The number of patients reported not to be taking their medications as directed on the prescription label (i.e., misusers) varies. One study found that 25% of a group of 50 patients > 65 yr were not taking their drugs as labelled (Lundin, 1978); another study reported 42.8% of 180 patients in this category (Latiolais & Barry, 1969); and Solomon *et al.* (1978) reported 58.7% of 46 home care patients misusing at least one of their drugs. It is interesting to note that a 1984 survey of the American public reported 41% of all Americans admitted to not always taking their medications exactly as prescribed (Anon., April 1985). Twenty-five patients (35.7%) in the present study admitted noncompliance with at least one of their drugs.

The wide range reported for the number of patients who misuse their medications may be due to the definition of noncompliance used by each researcher. If a noncompliant patient is defined as one who occasionally misses a dose of drug, the rate of noncompliance reported will be higher than in a study which defines noncompliance as frequently missing doses and does not count the occasional missed dose. Another pitfall in defining noncompliance is the patient who takes the drug differently than the prescription label directs but who says the doctor directed him to do so. That patient may very well be compliant with these new directions but, depending on how compliance is defined in a study, may be counted as noncompliant. Thus the problem of defining compliance is a difficult one. At present, there is a lack of a standardized method of



measuring this variable. To be able to compare study results and to grapple with the problem of noncompliance in terms of its impact on health care costs, a standard measure is needed. A patient occasionally missing a dose of a drug may be defined as noncompliant in the strictest sense of the word yet the question of whether that patient is putting himself at increased risk of treatment failure is debatable.

What reasons do patients give for their noncompliant behaviour? Lundin (1978) reported that one of the most frequent reasons given by patients for not taking their drugs as labelled was the doctor telling them to change. Cooper *et al.* (1985) conducted a study of home care patients which revealed that of the 28% of prescription medications reported to have been taken on a schedule that deviated from the instructions on the prescription label, 22% were changed because of verbal instructions from the physician to do so. The present study showed that 25 patients did not take their medications as directed on the label and 10 of these patients (40%) stated the reason as having been given different instructions by their physician. Five patients out of the 25 admitting noncompliance (20%) gave their reason as frequently forgetting doses. This was the second most frequent type of misuse and agreed in this respect with other studies (Latiolais & Barry, 1969 ; Anon., April 1985). Some of the other reasons given included stopping a medication because the patient felt it was no longer needed and taking extra doses of a drug when deemed necessary by the patient.

In looking at the results of nonparametric correlations performed between compliance and selected variables, there are two points worthy of note. As was discussed in Section 1.0 at the beginning of this chapter, Method I was chosen as the compliance measure to be used in this study. A significant correlation was found between noncompliance and the number of prescription medications being taken by the patient [ $r = .402, p = 0.001$ ] as well as the time since the patient was first admitted into the home care program [ $r = .297, p = 0.013$ ]. Thus

these two variables could be used as predictors of compliance in home care patients. No relationship was found between compliance and patient age or number of diagnoses listed for a patient. The second point to be noted is the relationship shown between compliance and the percentage of prescription drugs taken according to label directions (with respect to frequency of administration [ $r = .656, p < 0.001$ ] and with respect to the number of tablets or capsules taken each time [ $r = .415, p < 0.001$ ]). The number of prescription drugs taken according to label directions was used as part of the determination of compliance and so would be expected to show a significant correlation with compliance.

### 3.0 Nonprescription Drugs & Drug-Related Problems

The study of home care patients conducted by Cooper *et al.* (1985) revealed that 30% of all medications taken by these patients were nonprescribed (OTC) and most were taken correctly with few problems associated with their use. The results of the present study were in agreement with these findings. Of a total of 446 drugs being taken by the 74 patients in the SRHCP, 154 or 34.5% were OTC medications; 112 of the 154 nonprescribed drugs (72.7%) were used by patients for an officially approved purpose; 149 of the 154 total (96.7%) were taken in an officially approved dose. There were three patients, out of the 54 who were taking one or more OTC drugs, who had no idea what any of these drugs were for and one patient who did not use any of his OTC drugs for an officially approved indication. However, these cases were a minority.

The number of OTC drugs taken by a patient was not related to the patient's age, number of diagnoses listed for a patient or the number of prescription medications taken by the patient. Except for the three patients who did not know the use of any of the OTC drugs they were taking and the one patient who was not using his OTC drugs for a recommended purpose, nonprescribed medications were not a problem among the 74 patients interviewed in this study.

This low incidence of problems associated with nonprescription drug use may be due in part to the extensive information made available by the manufacturer on the label of the container.

Even though an OTC drug is taken for an officially recommended purpose in an officially recommended dose, patients may still be facing problems with their nonprescribed drugs. For example, a patient may be consuming two or more vitamin preparations. The dose of each drug product taken by the patient may be the recommended one, yet all together, the patient may be consuming far more than the recommended daily adult dose of one or more vitamins and in fact, may be consuming a toxic amount. There is also the possibility of there being a drug interaction between a patient's prescribed drugs and the nonprescribed medication that the patient has chosen to use. In the present study, 9 patients were taking five or more OTC drugs at the time of the survey and 3 of these 9 patients were taking eight OTC's. As the number of drugs taken becomes greater, the chances of a problem developing are increased. A pharmacist could be of help to patients in counselling them on their choice of nonprescribed drugs and helping them avoid irrational combinations.

#### 4.0 Selected Demographic Variables & Drug-Related Problems

##### 4.1 LIVING ARRANGEMENTS

In this study, 25 patients out of 74 (33.8%) lived alone while 49 patients (66.2%) lived with another person. Living alone has been shown by previous studies to be a risk factor for noncompliance (Blackwell, 1973 ; Canada, 1974). Cooper *et al.* ( 1985) in a study of home care patients found that 29% lived alone and those doing so were more likely to be noncompliant. The frequency of noncompliance in the present study was found to be no greater in patients living alone than in patients living with another person [ $p = .970$ ]. The difference in results of this and previous studies may be due to differences in the groups of home care patients and/or

differences in the measures of compliance used.

#### 4.2 AGE

The findings of this study supported the expectation of an older person having a greater number of medical problems compared to someone younger. Increasing age was related to an increasing number of diagnoses listed for the patient [ $r = .344$ ,  $p = 0.003$ ]. The number of diagnoses and the number of prescription medications taken by the patient also showed a significant positive correlation [ $p < 0.001$ ]. However, age was not related to the number of prescribed drugs taken or the number of OTC drugs taken. Cooper *et al.* (1985) in his study of home care patients also found no statistically significant relationship between age and the number of prescribed drugs. Patients in a home care program are suffering from conditions that would require their hospitalization if such a program were not available. Thus, all such patients regardless of age, would be expected to be taking medication whereas a sample drawn from the population at large might show a relationship between advancing age and increasing number of drugs being taken.

Based on analysis of the relationship between age and other variables in this study, age cannot be used as a predictor of the total number of drug-related problems faced by the patient or a patient's compliance. Although some studies have reported elderly patients to be at increased risk for noncompliance (Blackwell, 1973), a survey of the American public indicated that 81% of persons 65 to 74 years said they always took medication exactly as prescribed compared to 48% of those 18 to 24 years of age. The present study could not detect any relationship at all between age and compliance. One reason for this discrepancy could be that compliance in home care patients is affected by many other factors which would not be encountered by persons chosen randomly from the general public. One example is the presence of a chronic debilitating

disease; duration of a disease and its treatment have been shown to be risk factors for noncompliance.

One objective of this study was to determine if those patients 65 years of age and over differed from those <65 years with respect to the number of medications being taken and their knowledge of prescription drugs (measured by knowledge of drug names and uses). No significant relationship between age and these variables was detected using Spearman's rank correlation coefficient. When the patients were divided on the basis of age (those <65 yr and those 65 years and over), no significant difference was found between the two age groups for the number of prescription drugs taken by a patient, the number of OTC drugs taken by a patient, the percentage of prescription drugs for which the patient knew the name and the percentage of prescription drugs for which the patient knew the use. Thus, compared to younger patients, elderly patients in a home care program do not take more prescription or OTC drugs and know the name and use of as many of their drugs.

#### 4.3 HOME CARE HISTORY - TIME SINCE the PATIENT was FIRST ADMITTED INTO the PROGRAM

For each of the study patients, the time since their first admission into the Saskatoon Rehabilitation Home Care program was recorded. Patients were not registered on a continuous basis but were discharged from and readmitted to the program as their condition required. However, the time since admission to the program was assumed to be an indicator of the duration of the patient's condition and therefore, of the duration of therapy for that condition.

There is strong support for the view that adherence to treatment decreases with time (Luntz and Austin, 1960 ; Francis *et al.*, 1969 ; Caldwell *et al.*, 1970 ; Haynes, 1979). The present study supported this view. Time since first admittance into the SRHCP and noncompliance (Method I) were positively correlated [ $r=.297$  ,  $p =0.013$ ]. Thus, as the

duration of a patient's therapy increased, his or her compliance with prescription medication decreased.

This "time" variable was also correlated with the percentage of prescription drugs for which the patient knew the name (i.e., As the time since the patient was first admitted into the SRHCP increased, the percentage of prescription drugs for which the patient knew the name increased.). The longer patients took a particular drug, the more likely they would remember the name just from repeatedly looking at the label. This conclusion was confirmed by also finding a relationship between the percentage of prescription drugs for which the patient knew the name and the percentage of prescription drugs that the patient had taken for > 1 year [p < 0.001]. However, there was no correlation between the percentage of prescription drugs for which the patient knew the use and the time since admission into the home care program or the percentage of drugs which the patient had taken for > 1 year. Thus duration of therapy did not seem to affect a patient's knowledge of the use(s) of medications.

#### 5.0 Lack of Provision of Drug Information & Drug-Related Problems

As mentioned previously under Section 2.1 of this chapter, patients need to be given information about their medications in the hope of increasing their compliance. A combination of verbal and written information is the best method of educating the patient about his or her drugs (Balderson, 1979; Smith, 1981).

Only 32 of 71 patients (45.1%) in the present study said they had been given information on their prescription drugs. Solomon et al. (1978) reported a similar percentage of home care patients had received information on their drugs. Thus, in both these instances, over 50% of the patients stated they had not been given drug information. The pharmacist is the last health professional to come into contact with the patient before the sole responsibility for

responsibility for taking the prescribed medication falls to that patient. Because the pharmacist has the drug knowledge to pass on to the patient and should be doing so, it is surprising to find such a high percentage of home care patients that deny being given such information.

To investigate this area further, a chi-square analysis was performed to determine if a relationship existed between the way in which a patient got his prescription medications from the pharmacy (divided into those who picked up their drugs in person and those who had them delivered or picked up by someone else) and compliance measured by Method I (divided into those who were compliant with all their medications and those who were noncompliant with one or more drugs). Theoretically, a patient who went to the pharmacy in person to pick up his medications would give the pharmacist an opportunity to educate the patient concerning his prescriptions. These patients should be more knowledgeable than those who did not get this one-to-one teaching and this should be reflected in increased compliance for this group. However, such a relationship did not exist in the sample of patients chosen for this study. As stated before, knowledge of drug treatment regimens does not ensure compliance and maybe the results reflected this. Also, only 10 patients in this study said that they personally picked up their medications all the time; there may have been too few patients in this category for any statistically significant differences to be detected. Another possibility is that pharmacists on the whole are not being the drug information providers they should be or that their efforts are ineffectual. It is not a matter to be overlooked and requires further investigation.

To those patients who acknowledged receiving information on their medications, the question of who had provided that information was posed. Seventeen patients (54.8%) in the present study named the pharmacist and six (19.4%) named their physician. This was in direct contrast to the results of two other studies in which the patients named the physician more often than the pharmacist as the provider of drug information (Solomon *et al.*, 1978 ; Smith &

Sharpe, 1984).

Another question posed to the study patients was whom they would ask if they had a problem with their medications. Sixty-four patients (87.7%) named the physician as the first person they would contact; only 7 patients (9.6%) said they would call the pharmacist first. These results agree with those found by other researchers. A survey conducted for Pfizer Pharmaceuticals revealed that patients would first go to their physicians and then to pharmacists for drug information (Anon. April 1985). In one study, pharmacists were mentioned by only 1 in 6 of the respondents (16.7%) as the person to ask for drug information whereas physicians were mentioned by 79.3% (Smith & Sharpe, 1984). Why are pharmacists not viewed as the drug experts? More research is needed to answer this question and to provide direction to pharmacists as to methods for improving their status in the eyes of the patient.

#### 6.0 Total Number of Drug-Related Problems Faced by Patients & Factors Related to These

This study was designed to collect data of a general nature which would point out drug-related problems faced by home care patients. After each patient interview, the questionnaire was reviewed and medication-related problems assessed. These problems were divided into those related directly to the patient (e.g., misuse of medications) and those related directly to the physician (i.e., those problems requiring consultation with the physician before they could be solved). The decision that a patient had a drug-related problem was based on the author's perception of the situation. If intervention could improve patient care in a significant way as judged by the author, then that patient was assessed as having a problem.

The following cases are to help illustrate situations which were classed as drug-related problems. The first example was a 57 year old female who suffered with muscle aches and pains as well as severe headaches. During the course of the interview, she mentioned that she had been



admitted to hospital in 1984 for using too much Anacin<sup>®</sup> (100 tablets a week). She said that she had not realized this dose was excessive. Among the medications taken by this patient were the following analgesics:

1. Entrophen<sup>®</sup>-10 (containing 600 mg acetylsalicylic acid) - taken only occasionally,
2. Dristan<sup>®</sup> AF Tablets (containing 162.5 mg acetaminophen plus other drugs) - 2 tablets daily,
3. Tylenol<sup>®</sup> Extra Strength (containing 500 mg acetaminophen) - usually 2 tablets a day unless the pain was severe in which case the tablets were taken more frequently,
4. Acetaminophen 325 mg (generic brand) - taken for pain when needed, and
5. Panadol<sup>®</sup> (containing 500 mg acetaminophen) - taken for pain when needed.

This patient had no idea that four of these products contained the same drug. All she was concerned with was relieving her aches and pains. As well, she was abusing laxatives. Assessment of the situation after the interview resulted in the author listing this patient as having a total of two drug-related problems, one of which was physician-related and one of which was patient-related. She needed to be counselled on analgesic and laxative use and the physician needed to be consulted about an approach to her pain control.

Another example was a 72 year old male suffering from chronic obstructive lung disease, congestive heart failure and gout. He reported during the interview that he was taking allopurinol for his gout but he had run out of medication several days before. Knowing that there were no refills left on the prescription and that the physician would want to see him before renewing it, the patient decided to substitute another of his drugs that he knew was for gout. This was indomethacin. He had no idea of the different indications for the two drugs in the treatment of gout. Also he was using Dristan<sup>®</sup> Nasal Spray every night for his stuffy nose so that he could sleep and he was dumping all his new prescriptions into old containers (even if the directions for use

were different) because the tops were easier to remove. The number of drug-related problems listed for this patient was three. He needed to be counselled on the use of gout medications, on the problems that could possibly develop with his daily use of a decongestant nasal spray and on the availability of easy-to-open prescription vials from the pharmacy on request.

A final example was a 69 year old female with severe chronic obstructive lung disease. Recently she said that she had been very depressed and was to the point of considering suicide. She telephoned her physician for help and was given a prescription for trimipramine. She took one tablet that evening and slept so soundly that she did not wake until noon the next day. All the rest of that day she was so "groggy" that she could hardly function. She then decided to try and cope with the depression without pills but kept them if she ever needed a good sleep. This situation was assessed by the author to be a patient-related drug problem which could be dealt with by counselling the patient on the way in which antidepressant drugs act and their expected side effects.

In an attempt to discover what patient factors were related to problems that a patient was perceived to have, the total number of drug-related problems listed for each patient was statistically analyzed using Spearman's rank correlation coefficient with regard to certain selected variables. As noted in Chapter VI Section 5.2, a significant correlation was found between the total number of drug-related problems and the number of diagnoses listed for a patient, the number of prescription drugs taken by a patient, the percentage of prescription drugs which the patient took according to label directions and patient compliance (Method I). The more diagnoses that a patient had, the greater the number of problems faced by that patient. One possible explanation for this finding is that there would be a wider range of medications prescribed for a patient having several diseases. With an increased number of drugs, problems

of compliance, additive effects of medications or side effects would be more likely to occur. This same reasoning could be applied to the finding that the greater the number of prescription drugs taken by a patient, the greater the number of drug-related problems a patient was assessed as having. Also, patient compliance was related to the number of medication-related problems experienced by a patient. The greater the degree of patient compliance, the fewer the number of problems listed. Thus the above variables could be used to predict which patients would be at greatest risk of facing a problem with their medications.

Factors having no bearing on whether a patient was listed as experiencing a drug-related problem were patient age, the time since the patient was first registered in the SRHCP, the number of OTC drugs taken by a patient, the percentage of prescription drugs for which the patient knew the name and the percentage for which the patient knew the use.

#### 7.0 The Pharmacist as a Member of the Rehabilitation Home Care Team

A secondary objective of the study was to provide a recommendation, based on the data gathered, as to whether a pharmacist should be a part of the rehabilitation home health care team and what a pharmacist could offer in this capacity.

On looking at some of the findings of the present study, it is evident that a pharmacist would be a valuable asset to the home care team. With respect to prescription drugs, 16 patients could not give a name for any of the ones they were taking; 4 patients could not give a use; 25 patients admitted noncompliance on a "regular" basis with at least one or more; and 42 patients had no idea what the correct procedure was if they missed a dose for any reason. In all these cases, a pharmacist could be of use in teaching patients about their medications (e.g., name, strength, purpose, side effects, what to do if a dose is missed) and the consequences of noncompliant behaviour. In fact, one study noted that the attention given to patients by health

workers may be just as important in improving compliance as is the actual information provided (McKenney, 1981). A pharmacist on the home care team who could teach patients on a one-to-one basis in their homes may have a significant impact on a patient's compliance with their drug treatment regimen.

Nine patients were taking five or more nonprescription medications and one of these nine was actually taking 10 OTC drugs. Although most patients took OTC drugs in the correct dose for an officially recommended purpose, a pharmacist's advice could be valuable in many cases. Patients may be correctly taking several different OTC products when viewed on an individual basis but in actual fact, may be consuming far more than the recommended daily adult dose of one or more specific ingredients when an overall assessment is made. Also, patients may be taking several similar drugs (e.g., several laxatives, prescribed &/or nonprescribed) at once. A pharmacist could offer advice on what OTC drugs (e.g., vitamins or laxatives) would be the best choices for a particular patient and may even help the patient save money by doing so.

Thirty-nine patients out of 74 (54.0%) said they had never been given information on their prescription drugs and twelve patients expressed a desire to have more drug information made available to them. There were 32 patients who said they never picked up their drugs from the pharmacy in person thus missing the opportunity of having a pharmacist talk to them about their prescriptions. In all these situations, a pharmacist as a member of the home care team could make a valuable contribution by providing drug information to patients in their home on a one-to-one basis.

With 52 patients or 70.3% being designated in this study as having at least one drug-related problem, it is obvious that a pharmacist should be a part of the home care team. It is unrealistic to expect the pharmacist to be able to completely solve all problems but it is not an unrealistic expectation that the pharmacist significantly reduce the number of these

problems. As well as contributing to patient care, the pharmacist would also be available to conduct educational sessions for home care staff.

The need for a pharmacist as a full-time member of the Saskatoon Rehabilitation Home Care team is evident. Based in part on the findings of this study, it is recommended that the pharmacist perform the following functions as a team member:

1. ensuring that an adequate patient medication history is recorded in the patient's chart and that the patient's medication profile is kept up to date,
2. educating the patients and/or their families about medications (e.g., drug name, use, possible side effects). Verbal counselling should be reinforced with suitable written patient information,
3. assisting patients in proper selection and use of OTC medications,
4. monitoring the drug therapy of patients in order to detect therapeutic failures, adverse reactions or interactions, the need for therapy change or discontinuation, dosage errors, situations of abuse, and other factors which may contribute to drug-related problems,
5. acting as a liason between the patient and/or other members of the home care team and the family physician or specialist,
6. providing inservice programs and educational sessions on drug therapy to home care team members including the patient's physician(s),
7. participating in home health conferences during which drug therapy will be discussed and recommending changes, and
8. making home visits to negotiate drug-related problems upon the request of home care personnel or when the pharmacist deems it necessary.

## 8.0 Limitations of the Study

There are inherent limitations in this study which must be recognized when evaluating the results and applying the findings to other settings:

1. Although home care programs in other Canadian provinces may be similar to the Saskatoon Rehabilitation Home Care Program, results of this study should not be extrapolated unconditionally to these other programs.

2. The patients who took part in this study were ones who readily agreed to do so; no pressure was placed on them to participate. It is possible that the results obtained from the study would have been different if all patients contacted had been required to be interviewed.

3. All responses recorded on the questionnaire were those of the patients. No effort was made to corroborate patients' statements. For example, the patient's answer to whether or not he or she was compliant with his or her medications was taken as being true.

Patients' responses may have been distorted by the patient not wanting to admit "missed doses" or erroneously believing that the survey was a disguised method of "policing" drug use. The patient may have tailored his or her responses to give an answer that was thought to be the "correct" one.

4. The problems, if any, that the patient faced with respect to his medications were those that the author personally felt existed. These judgments, although based on good pharmacy practice, may have been perceived differently by another individual. However, whatever bias may be in these evaluations is lessened to some extent by the fact that all interviews were conducted by the same person.

5. The compliance measure, designated Method I and described in Chapter VI Section 5.1, was derived from data obtained on the questionnaire. The study was not originally designed to measure compliance in this way. The original intent was to use the "pill count" method but

this was abandoned due to complicating factors. Thus, caution should be exercised in interpreting any of the results involving "compliance" as a variable.

6. The study population of 432 patients from among whom the sample population was chosen may not have been representative of patients registered in the SRHCP at any time. Since annual data on only the age and sex of the patients were available, it was not possible to state whether the sample population was a representative one.

## CHAPTER VIII

### CONCLUSIONS

The following conclusions may be drawn from the results of the study:

1. The data gathered during the interviews provided a wide range of information. In patients registered with the SRHCP, females outnumbered males in a ratio of approximately 1.4 to 1. Patients 65 years and older comprised 60.3% of this population ; 33.8% of all patients lived alone.

Twenty-five patients (35.7%) were found to be noncompliant with one or more of their medications . Fifty-seven percent of the patients knew the use of all their prescribed drugs and only 4 patients (5.7%) did not know the use of any. More than 50% of patients stated they had not been given information on their prescription drugs and 87.7% named the physician as the first person they would contact if they had a problem with any of their medication. Eighty-one percent of patients said they bought their prescription drugs at one pharmacy only.

Fifty-four patients were taking OTC drug products with the average number per patient being 1.7 for those patients < 65 yr and 2.4 for those 65 years and older. Of the total of 154 nonprescription drugs being taken, 72.7% were used for an officially recommended purpose and 96.7% were taken in an officially approved dose. Sixty-three percent of patients purchased their OTC's at a pharmacy.

Fifty-two patients (70.3%) interviewed were assessed as having one or more drug-related problems.

2. Over 50% of the patients registered in the Saskatoon Rehabilitation Home Care program faced at least one drug-related problem. More of the drug-related problems were



patient-related than physician-related and for resolution would require patient counselling rather than physician consultation.

Predictors of the number of drug-related problems faced by a patient were:

a. the number of diagnoses listed for a patient (i.e., the greater the number, the greater the number of problems),

b. the number of prescription drugs taken by the patient (i.e., the greater the number, the greater the number of problems), and

c. patient compliance (i.e., the greater the percentage of drugs for which a patient is noncompliant, the greater the number of problems).

3. A measure of a patient's compliance using an indirect method is difficult to obtain.

Whatever method is chosen must be clearly defined in order that comparisons may be made between different studies.

Among patients on a home care program, two predictors of patient compliance were the number of prescription drugs taken by a patient and the length of time that patient had been in the home care program. An increase in the number of prescription drugs taken or an increase in the time since the patient was first admitted into home care were associated with a decrease in patient compliance with a medication regimen.

4. There was no difference between patients <65 years and those 65 years and older with respect to the number of drugs (both prescribed and nonprescribed) being taken by the patient, the percentage of prescription drugs for which the patient knew the name and the percentage of prescription drugs for which the patient knew the use. Neither patient compliance nor the total number of drug-related problems faced by a patient were related to age.

5. The home care team should include a pharmacist as a member. The pharmacist could assist in identifying and in solving drug-related problems faced by patients and could provide educational inservices to the rest of the home care staff as well as to other interested persons.

CHAPTER IX  
RECOMMENDATIONS for FUTURE RESEARCH

1. In attempting to assess compliance for the purposes of this study, the many ways possible of classifying a patient as being noncompliant were realized. The criteria used by a researcher for stating whether a patient is compliant or not with a medication regimen will greatly influence the results. There does not seem to be a standard indirect measure of compliance and thus it is very difficult to compare results of different studies dealing with compliance. It would be extremely useful for a research project to be designed which would determine the best "indirect" method of measuring compliance and then having this become the "standard".

2. The results of this study showed that over 50% of patients in the Saskatoon Rehabilitation Home Care program faced one or more drug-related problems. This led to the recommendation that a pharmacist be hired as a member of the home care team. Ideally, a further study needs to be carried out measuring the impact of the pharmacist on solving and/or reducing the number of problems. As well, a cost/benefit analysis of a pharmacist's contribution could be attempted.

3. This study found that 87.7% of the patients interviewed named the physician as the first person that patient would contact if a drug-related problem occurred. Only 9.6% of patients said they would call the pharmacist first. These results were in agreement with those of other studies. A research project needs to be designed to answer the question of why patients do not regard the pharmacist more highly in this area and what pharmacists should be doing to improve their status in the eyes of patients.

ORIGINAL QUESTIONNAIRE

**PATIENT BACKGROUND INFORMATION**

Patient's Name:

Address:

Saskatchewan Hospital Number:

Date of Birth:

Age in years:

Sex:     M         F

Race:

Primary medical diagnosis:

Secondary medical diagnosis:

Allergies:

Patient's Living Arrangements:

- 1. Lives alone
- 2. Lives with spouse only
- 3. Lives with one family member (other than spouse)
- 4. Lives with two or more family members
- 5. Lives with non-related person or persons
- 6. Other (specify)

Total number of persons living with patient:        \_\_\_\_\_

Date of current admission to Home Care:

Physician referring patient to Home Care:

Date form completed:

QUESTIONNAIRE for REHAB. HOME CARE PATIENTSPatient Name:Address:Date of Interview:Time at beginning of interview:Name of Interviewee:

\_\_\_1. Patient \_\_\_2. Spouse \_\_\_3. Other relative \_\_\_4. Other person

IF interviewee is other than the patient:

\_\_\_1. Lives with patient \_\_\_2. Does not live with patient

Patient Allergies:

I. A. First of all, I am interested in what medicines you take during a day. Sometimes if a person takes alot of medicines it is hard to remember them all. To make it easier for you to answer this question, think back to this morning when you woke up.

- 1) Did you take any medicine at this time?
- 2) Did you take any medicine before breakfast? with breakfast? after breakfast?
- 3) Did you take any medicine between breakfast & lunch?
- 4) ----Before lunch? with lunch? after lunch?
- 5) ----Between lunch & supper?
- 6) ----Before supper? with supper? after supper?
- 7) ----Between supper & bedtime?
- 8) ----At bedtime?

IF YES to any of the above:

9) Do you know what the medicine that you take \_\_\_ (before for lunch for eg.) \_\_\_ is called?  
*(Patient may already have supplied this info. during previous questions.)*

\_\_\_1. Yes \_\_\_2. No Record name if patient states it here

FOR EACH DRUG:

10) Do you know the strength of \_\_\_ (drug) \_\_\_?

\_\_\_1. Yes \_\_\_2. No

11) How often do you take \_\_\_ (drug) \_\_\_?

\_\_\_1. according to directions on bottle \_\_\_2. Other

*(The correctness of this answer will be ascertained later on when the patient's prescription vials are checked.)*

12) How many \_\_\_ (tabs., caps., etc.) \_\_\_ of \_\_\_ (drug) \_\_\_ do you take each time? \_\_\_\_\_

\_\_\_1. according to directions on bottle \_\_\_2. Other

*(The correctness of this answer will be ascertained later on when the patient's prescription vials are checked.)*

13) Do you take any food or liquid with your pills?

\_\_\_1. Yes \_\_\_2. No

IF YES , what kind of liquid?

1. B. 14) In the last 30 days, have you taken any medicines that you can buy at the store without a prescription, such as - (use list to stimulate recall):

- |                             |                                |
|-----------------------------|--------------------------------|
| a. Antidiarrheals           | b. Cold medicines              |
| c. Cough syrups             | d. Nose drops/sprays           |
| e. Drugs for nerves         | f. Drugs to stay awake         |
| g. Drugs for water          | h. Drugs to sleep              |
| i. Drugs for weight control | j. Laxatives                   |
| k. Pain medicine (headache) | l. Topical preps. (skin, hair) |
| m. Stomach preps. (antacid) | n. Vitamins                    |
| o. Rectal (hemorrhoids)     | p. Other                       |

Total number of OTC drugs used: \_\_\_\_\_

If patient has used any OTC drugs, ask the following questions:

15) Do you know the name of the medicine that you take for           (condition patient mentioned above)          ?      \_\_\_1. Yes      \_\_\_2. No  
*(Patient may already have supplied this information during previous question.)*

16) Do you know the strength of           (drug)          ?  
\_\_\_1. Yes      \_\_\_2. No      \_\_\_3. NA

17) When do you take           (drug)          ?  
\_\_\_1. According to directions on container      \_\_\_2. Other

18) How many           (tabs, caps, etc.)           of           (drug)           do you take each time?  
\_\_\_1. According to directions on container      \_\_\_2. Other

19) Do you take any food or liquid with your pills?  
\_\_\_1. Yes      \_\_\_2. No  
If YES, what kind of liquid etc.?

II. 20) Will you show me where you keep your medicines?

- (a) List ALL prescription drugs
- (b) List ALL OTC drugs
- (c) For all prescription drugs, note:

(i) date of prescription ie. when it was dispensed  
\_\_\_1. within 30 days      \_\_\_2. 31 days - 1 year      \_\_\_3. > 6 mo.  
\_\_\_4. Continuation (more than 1 prescription)

- (ii) where it was filled (name of pharmacy)
- (iii) prescription number
- (iv) physician's name
- (v) no. of tabs. left in vial

(d) For both prescription & OTC drugs:

(i) where is the drug stored?

The drug is being stored properly:

- \_\_\_1. Yes                      No because    \_\_\_2. Not refrigerated                      \_\_\_3. Too hot  
    \_\_\_4. Uncapped safety vial                      \_\_\_5. Uncapped non-safety vial  
    \_\_\_6. In reach of children                      \_\_\_7. Other (specify)

(ii) if med. is outdated

(iii) Are you taking this drug now?

- \_\_\_1. Yes  
 \_\_\_2. No, took it all, not told to refill  
 \_\_\_3. No, made me sick  
 \_\_\_4. No, I didn't like the drug  
 \_\_\_5. No, ran out, not yet refilled  
 \_\_\_6. No, other (specify)

III. I would like to ask you some more questions about the medicines that you are now taking. You may or may not know the answer to all these questions and I don't expect you to. Just answer as many as you can.

For EACH PRESCRIPTION DRUG that the patient is taking:

21) (a) Going back to \_\_\_(drug)\_\_\_, do you know what this drug is used for?

- \_\_\_1. No, patient professes ignorance                      Record specific answer  
 \_\_\_2. No, patient believes he knows, but doesn't                      \_\_\_\_\_  
 \_\_\_3. Yes, patient partially correct                      \_\_\_\_\_  
 \_\_\_4. Yes, patient fully correct                      \_\_\_\_\_

(b) What is your understanding of how it works in the treatment of control of \_\_\_  
 (condition)\_\_\_ ?

- \_\_\_1. No, patient professes ignorance                      Record specific answer  
 \_\_\_2. No, patient believes he knows but doesn't                      \_\_\_\_\_  
 \_\_\_3. Yes, patient partially correct                      \_\_\_\_\_  
 \_\_\_4. Yes, patient fully correct                      \_\_\_\_\_

(c) The directions on the prescription vial of \_\_\_(drug)\_\_\_ say to take this  
 medicine \_\_\_(three times a day for eg.)\_\_\_.

At what times of the day do you actually take this drug? \_\_\_\_\_

- \_\_\_1. appropriate                      \_\_\_2. inappropriate

(d)i. Do you take more than the prescribed dose at any one time of administration?

- \_\_\_1. Yes                      \_\_\_2. No



ii. Do you take more than the prescribed number of doses per day?

1. Yes       2. No

iii. Do you take less than the prescribed dose at any one administration?

1. Yes       2. No

iv. Do you ever omit one or more doses?

1. Yes       2. No

v. Do you take this drug at times other than those specified on the directions?

1. Yes       2. No

If YES to any of the above 5 questions, ask the patient if there was a reason that this happened.

i) Did not understand the instructions

1. Yes       2. No       3. NA

ii) Sometimes forgot to take a dose

1. Yes       2. No       3. NA

iii) Patient feels he/she doesn't need the drug anymore

1. Yes       2. No       3. NA

iv) Doesn't like taking the drug

1. Yes       2. No       3. NA

v) Thought an extra dose was needed

1. Yes       2. No       3. NA

vi) Medications got mixed up

1. Yes       2. No       3. NA

vii) Patient noncommunicative as to reasons

1. Yes       2. No       3. NA

viii) Other - specify \_\_\_\_\_

1. Yes       2. No       3. NA

(e) How long have you been taking this drug?

1. < 30 days       2. 30 days - 1 year       3. >1 year  
 4. Not continuously but had been taking it prior to today

(f) i. Have you had any reactions to this drug?

1. Yes       2. No

ii. If YES: What type of reaction? (Do not stimulate recall)

- |   |   |
|---|---|
| <input type="checkbox"/> a. Constipation    | <input type="checkbox"/> g. Rash        |
| <input type="checkbox"/> b. Diarrhea        | <input type="checkbox"/> h. Nervousness |
| <input type="checkbox"/> c. Dizziness       | <input type="checkbox"/> i. Vomiting    |
| <input type="checkbox"/> d. Drowsiness      | <input type="checkbox"/> j. Dry mouth   |
| <input type="checkbox"/> e. GI distress     | <input type="checkbox"/> k. Insomnia    |
| <input type="checkbox"/> f. Nausea          | <input type="checkbox"/> l. Itching     |
| <input type="checkbox"/> m. Other (specify) |   |
| <input type="checkbox"/> n. None            |   |

iii. If YES: Did you notify someone about this reaction?

1. Yes                       2. No

If YES: Who?

- |  |                                      |  |
|--|--------------------------------------|--|
| <input type="checkbox"/> 1. Referring MD | <input type="checkbox"/> 2. Other MD | <input type="checkbox"/> 3. Pharmacist |
| <input type="checkbox"/> 4. Nurse        | <input type="checkbox"/> 5. Other    |  |

If YES: Was anything done about it?

1. Yes                       2. No

(g) Sometimes when a person is taking a certain drug, they may have to avoid other drugs or particular foods. On the other hand, they may be asked to add specific foods to their diet.

Are you aware of any special instructions, such as I have just mentioned, that you should follow when taking \_\_\_\_\_ (drug) \_\_\_\_\_?

1. Yes                       2. No

If YES, what instructions? \_\_\_\_\_

1. Info. correct               2. Info. incorrect

(h) If you should miss a dose of \_\_\_\_\_ (drug) \_\_\_\_\_ for some reason, what should you do?

1. Patient professes ignorance  
 2. Patient believes he knows but doesn't  
 3. Patient is partially correct  
 4. Patient is fully correct

(22) (a) Have you ever been given any information (verbal or written) about when to take this drug, what it is for, where you should store it, drug side effects?

1. Yes                       2. No

(b) IF YES:

- |   |  |
|---|--|
| <input type="checkbox"/> 1. from pharmacist | <input type="checkbox"/> 2. from physician   |
| <input type="checkbox"/> 3. from nurse      | <input type="checkbox"/> 4. from other _____ |

(c) Type of information

- |   |   |
|---|---|
| <input type="checkbox"/> 1. Drug name       | <input type="checkbox"/> 2. Drug use                                      |
| <input type="checkbox"/> 3. Refill info.    | <input type="checkbox"/> 4. Administration (when or how to take the drug) |
| <input type="checkbox"/> 5. Side effects -  | <input type="checkbox"/> 6. Storage                                       |
| <input type="checkbox"/> 7. Other (specify) |   |

23) Did the patient ask the pharmacist (myself) for information regarding  
 (drug) \_\_\_\_\_ ?

\_\_\_1. Yes                      \_\_\_2.No

If YES:

(i) Instructions on administration (dosage, when or how)

\_\_\_1. Yes                      \_\_\_2. No

(ii) Instructions on storage

\_\_\_1. Yes                      \_\_\_2. No

(iii) Information on drug's identity or use

\_\_\_1. Yes                      \_\_\_2. No

(iv) Information on side effects

\_\_\_1. Yes                      \_\_\_2. No

(v) Information on potential drug interactions

\_\_\_1. Yes                      \_\_\_2. No

(vi) Information on diet while taking the drug

\_\_\_1. Yes                      \_\_\_2. No

IV. 24) Earlier, I asked you if you had taken in the last month, any medicines that you can buy at the store without a prescription. You told me that you had taken \_\_\_\_\_ (OTC drug) \_\_\_\_\_ .

(a) Can you tell me what you take this drug for?

(This is a recommended use: \_\_\_1. Yes                      \_\_\_2. No )

(b) How often do you take this drug?

(This is a recommended dosage \_\_\_1. Yes                      \_\_\_2. No )

(c) How did you decide to take this drug?

\_\_\_1. Advertising                      \_\_\_2. Physician  
 \_\_\_3. Pharmacist                      \_\_\_4. Friend  
    \_\_\_5. Other (specify)

(d) Where did you get this drug?

\_\_\_1. Pharmacy                      \_\_\_2. Multiple pharmacies  
 \_\_\_3. Other outlets (grocery etc.)    \_\_\_4. Physician (specify)  
    \_\_\_5. Other (specify)

(e) Have you had any side effects or reactions from this drug?

\_\_\_1. Yes                      \_\_\_2. No

25) Did the patient ask the pharmacist (myself) for information regarding  
      (drug)       ?

If YES:

(i) Instructions on administration (dosage, when or how)

1. Yes                       2. No

(ii) Instructions on storage

1. Yes                       2. No

(iii) Information on drug's identity or use

1. Yes                       2. No

(iv) Information on side effects

1. Yes                       2. No

(v) Information on potential drug interactions

1. Yes                       2. No

(vi) Information on diet while taking the drug

1. Yes                       2. No

Y. Now I would like to ask you some general questions.

26) (i) Who is your doctor at present?

(ii) Do you see any other doctors as well?  1. Yes                       2. No

If YES, get names.

(iii) Did you go to another doctor before you went to       (name of present doctor)       ?

(iv) Has Dr.       (name from question ii)       given you prescriptions for your medicines too?

(v) Did Dr.       (name from question ii)       know that you were also seeing Dr.       (name from question i)       and that you had been given prescription medications by Dr.       (name from question i)       ?

If YES: Did you tell him what medicines you were taking from Dr.   i   ?

27) At which drugstore(s) do you buy your medicines? Note names

1. only one                       2. more than one

28) Whom do you ask if you have any problem with your medicines?

1. Physician                       2. Pharmacist  
 3. Nurse                               4. Other (specify)

29) Does anyone help you in any way to remember to take your pills?

1. Yes                               2. No

If YES, Who is this person?

30) Do you use anything or do anything special to help you to remember to take your pills?

1. Yes                       2. No

If YES, what?

31) How do you get your medicines (either from the pharmacy or from some other outlet for OTC's) ?

1. in person       2. have them delivered       3. someone picks them up for you

1. all the time       2. combination of above

Record specific answer: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

VI. Time at end of visit:

Time in minutes for interview:

APPENDIX II

REVISED QUESTIONNAIRE

PATIENT BACKGROUND INFORMATIONPatient's Name:Address:Saskatchewan Hospital Number:Date of birth:Age in years:Sex:     \_\_\_ M     \_\_\_ FRace:Medical Diagnosis:Allergies:Patient's Living Arrangements:

- \_\_\_ 1. Lives alone
- \_\_\_ 2. Lives with spouse only
- \_\_\_ 3. Lives with one family member (other than spouse)
- \_\_\_ 4. Lives with two or more family members
- \_\_\_ 5. Live with non-related person or persons
- \_\_\_ 6. Other - specify

Total number of persons living with patient:     \_\_\_\_\_Date of current admission to Home Care:Previous dates of admission to Home Care:Physician referring patient to Home Care:Date form completed:

QUESTIONNAIRE for REHAB. HOME CARE PATIENTSPatient Name:Date of Interview:Time at beginning of interview:Respondent:

\_\_\_ 1. Patient \_\_\_ 2. Spouse \_\_\_ 3. Other relative \_\_\_ 4. Other person

If respondent is other than the patient:

\_\_\_ 1. Lives with patient \_\_\_ 2. Does not live with patient

Patient Allergies:DRUG INFORMATION:

I. Ask the patient if he/she knows the names of the medications that he/she is taking - FROM MEMORY (the patient is not to get the vials or containers and read off the names).

Use the following as a probe:

Sometimes if a person takes several medications it is hard to remember the names of them all. To make it easier for you to answer this question, think back to this morning when you woke up.

- Did you take any medicine at this time?
- Did you take any medicine before breakfast? -with breakfast? -after breakfast?
- Did you take any medicine between breakfast and lunch?
- Before lunch? - with lunch? -after lunch?
- Between lunch and supper?
- Before supper? - with supper? -after supper?
- Between supper and bedtime?
- At bedtime?

To make sure the patient has given all the drugs that he is taking, use the following as a probe for OTC drugs:

In the last month, have you taken any medicines that you can buy at the store without a prescription, such as (use list to stimulate recall):

- |                             |                                |
|-----------------------------|--------------------------------|
| a. Antidiarrheals           | b. Cold medicines              |
| c. Cough syrups             | d. Nose drops/sprays           |
| e. Drugs for nerves         | f. Drugs to stay awake         |
| g. Drugs for water          | h. Drugs to sleep              |
| i. Drugs for weight control | j. Laxatives                   |
| k. Pain medicine (headache) | l. Topical preps. (hair, skin) |
| m. Stomach preps. (antacid) | n. Vitamins                    |
| o. Rectal (hemorrhoids)     | p. Other                       |



RECORD RESPONSES BELOW: (record drug name first, then for each ask:

- strength
- number of tabs/caps taken each time
- how often patient takes the drug (eg. tid)
- at what times patient takes the drug ( eg. 10, 14 & 18 ) )

<u>Drug</u>	<u>Strength</u>	<u>No. of tabs/caps taken each time</u>	<u>Frequency of administration</u>	<u>Times at which meds. are taken</u>
-------------	-----------------	---	--	---

(9) Do you take any food or liquid with your pills?

1. Yes If YES, what? \_\_\_\_\_
2. No

II. Ask the patient to bring out all the medications that he is taking.

A. List all prescription drugs and for each record:

- (i) Drug name & strength
- (ii) Expiry date of drug if stated
- (iii) Pharmacy from which it was dispensed
- (iv) Prescription number
- (v) Physician's name
- (vi) Date prescription filled i.e. date dispensed
- (vii) No. of tabs. etc. left in vial (for NEW prescriptions ONLY - not refills)

B. List all OTC drugs

- (i) Drug name & strength
- (ii) Expiry date of stated on container

A. For each prescription drug:

(10R) (ii) Is this prescription a refill?

1. Yes                       2. No

(iii) How long have you been taking this drug?

1.  $\leq$  30 days               2. 31 days - 1 year               3.  $\geq$  1 year

4. Not continuously but had been taking it prior to interview date

(11R) Are you taking this drug now?

1. Yes  
 2. No, took it all, not told to refill  
 3. No, made me sick  
 4. No, I didn't like the drug  
 5. No, ran out, not yet refilled  
 6. No, other - specify \_\_\_\_\_

(13R) Where do you keep your medication?

\_\_\_\_\_

(14R) Going back to \_\_\_\_\_ (drug) \_\_\_\_\_, do you know what this drug is used for?

\_\_\_\_\_

(15R) What is your understanding of how it works in the treatment or control of \_\_\_\_\_ (condition) \_\_\_\_\_ ?

\_\_\_\_\_

(16R) (a) The directions on the prescription vial of \_\_\_\_\_ (drug) \_\_\_\_\_ say to take this medicine  
 \_\_\_\_\_ (eg. three times a day) \_\_\_\_\_ .

At what times do you actually take this drug? \_\_\_\_\_

- (i) Do you take more than the prescribed dose at any one time? YES or NO
- (ii) Do you take more than the prescribed number of doses per day? YES or NO
- (iii) Do you take less than the prescribed dose at any one time? YES or NO
- (iv) Do you take less than the prescribed number of doses per day? i.e. Do you ever omit one or more doses? YES or NO
- (v) Do you take this drug at times other than those specified on the directions? YES or NO

(b) If YES to any of the above five questions under part (a) , ask the patient if there was a reason that this happened.

- (i) Did not understand the instructions
- (ii) Sometimes forgot to take a dose
- (iii) Patient feels he/she doesn't need the drug anymore
- (iv) Doesn't like taking the drug
- (v) Thought an extra dose was needed
- (vi) Meds. got mixed up
- (vii) Patient noncommunicative as to reasons
- (viii) Other - specify \_\_\_\_\_

(17R) Sometimes when a person is taking a certain drug, they may have to avoid other drugs or particular foods. On the other hand, they may be asked to add specific foods to their diet.

Are you aware of any special instructions, such as I have just mentioned, that you should follow when taking \_\_\_\_\_ (drug) \_\_\_\_\_ ?

\_\_\_ 1. Yes If YES, what instructions? \_\_\_\_\_

\_\_\_ 2. No \_\_\_\_\_

(18R) If you should miss a dose of \_\_\_\_\_ (drug) \_\_\_\_\_ for some reason, what should you do?

\_\_\_\_\_

For prescription drugs in general

(19R) (a) Have you had any bad effects from your drugs? (e.g. reactions, side effects etc.)

1. Yes If YES, do you know which drug? \_\_\_\_\_  
 2. No

(b) If YES, what type of reaction? (Do not stimulate recall)

\_\_\_\_\_

(c) (i) If YES, did you notify someone about this reaction? Yes or No

(ii) If YES, whom? \_\_\_\_\_

(iii) If YES, was anything done about it? Yes or No

(20R) (a) (i) Have you ever been given any information (verbal or written) about when to take your drugs, what they are for, where you should store them, drug side effects etc. ?

1. Yes  2. No

(ii) If YES, can you tell me the names of the medications about which you received information? \_\_\_\_\_

(b) (i) If YES to part (a), from whom did you receive your information?

1. Pharmacist  2. Physician  
 3. Nurse  4. Other - specify \_\_\_\_\_

(ii) Type of information

1. Drug name  2. Drug use  
 3. Refill information  4. Administration (how or when to take the drug)  
 5. Side effects  6. Storage  
 7. Other - specify \_\_\_\_\_

(21R) (a) Did the patient ask me for information regarding any of his medications?

1. Yes  2. No

(b) If YES, which ones? \_\_\_\_\_

(c) If YES,

(i) Instructions on administration (dosage, when or how)  1. Yes  2. No

(ii) Instructions on storage  1. Yes  2. No

(iii) Information on drug's identity or use  1. Yes  2. No

(iv) Information on side effects  1. Yes  2. No

(v) Information on potential drug interactions  1. Yes  2. No

(vi) Information on diet while taking the drug  1. Yes  2. No

**B. For each OTC drug listed** (drug name & strength plus expiry date on container has been listed)

Now I would like to ask you a few questions regarding your OTC medications. These are drugs that you can buy over-the-counter without a prescription.

(24 OT) Are you taking this drug now?

1. Yes  
 2. No, took it all and decided not to buy any more  
 3. No, made me sick  
 4. No, I didn't like the drug  
 5. No, took it all and haven't been to buy any more as yet  
 6. No, other - specify \_\_\_\_\_

(25 OT) Where do you store your medications?

\_\_\_\_\_

(26 OT) Can you tell me what you are taking this drug for?

\_\_\_\_\_

(27 OT) How often do you take this drug?

\_\_\_\_\_

(28 OT) How did you decide to take this drug?

1. Advertising                       2. Physician  
 3. Pharmacist                          4. Friend  
 5. Other - specify \_\_\_\_\_

(29 OT) Where did you get this drug?

1. Pharmacy                             2. Physician  
 3. Other outlets (grocery etc.)     4. Other - specify \_\_\_\_\_

**For OTC drugs in general**

(30 OT) Have you had any bad effects from your drugs? (e.g. reactions, side effects etc.)  
Yes or No

If YES, do you know which drug? \_\_\_\_\_

(31 OT) (a) Did the patient ask me for information regarding any of his(her) OTC medications?

1. Yes                       2. No

(b) If YES, which drugs? \_\_\_\_\_

(c) If YES,

- (i) Instructions on administration (dosage, when or how)  1. Yes  2. No  
 (ii) Instructions on storage  1. Yes  2. No  
 (iii) Information on drug's identity or use  1. Yes  2. No  
 (iv) Information on side effects  1. Yes  2. No  
 (v) Information on potential drug interactions  1. Yes  2. No  
 (vi) Information on diet while taking the drug  1. Yes  2. No



V. General Comments:

VI. Patient problems with regard to medications as perceived from interview

VII. Suggestions as to what patient requires to help alleviate these problems