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An Evaluation of a Community Pharmacy Reimbursement Model for Cognitive Services

By

Harold Lopatka 

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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Abstract

The purpose of the research was to examine whether pharmacist cognitive services, drug utilization, and drug costs were affected by a new reimbursement model. Explanatory research examined pharmacists' perceptions about the model, and how the reimbursement model worked within the context of a communication model.

Volunteer pharmacies were randomly assigned to control or test pay groups. The experimental intervention was a fee-for-service payment to pharmacies only or a split between the pharmacy and the pharmacist. Pharmacists documented value-added cognitive services over an 18-month period. Participating pharmacists' perceptions of the reimbursement model were examined through a semi-structured telephone interview. The impact of the reimbursement model was examined retrospectively through a case study. A communications model provided the framework for analyzing the meaning of, interpretation of, and responses to the financial incentive.

A total of 385 pharmacists from 112 community pharmacies were eligible. Eighteen percent of pharmacists from 44% of the pharmacies submitted claims. Only 136 cognitive service claims were made on 193,253 prescriptions, producing a 0.07% intervention rate. In the comparison between test and controls there was no statistically significant difference in the frequency and mix of cognitive services, no difference in drug utilization, and no statistically significant difference in net costs (savings minus payments). The characteristics of the drug benefit plan population (small size and low incidence of drug-related problems) had a major effect on the experiment.

Fifty-seven percent of eligible pharmacists were interviewed. The major perceived obstacles identified were lack of time to complete documentation and difficulty identifying eligible clients. Pharmacists indicated the perceived impact of the payment model was very low. The obstacles were too strong to be overcome by the financial incentive.

The case study showed that the financial incentive did not work because it was based on an oversimplified assumption, did not create financial dependencies, and pharmacy organizations could not respond because of internal obstacles. The financial incentive was too weak as a communication signal to evoke the intended response.

The results of the research suggest that financial incentives alone may not be suitable to change pharmacist behaviour. Nine recommendations were made for researchers and policy makers.

Acknowledgement

A number of individuals and groups provided valuable assistance in allowing this research to occur. Major support came from my wife Joyce and children, Brent and Jaclyn, through their continued patience, understanding and love. My supervisor, Dr. John Bachynsky, was always accessible, approachable, kept the issues in perspective and provided his guidance throughout the duration of the research. My supervisory committee; Dr. Linda MacKeigan, Dr. Jan Storch and Dr. Richard Plain provided encouragement and valuable feedback over the research. Two pharmacists, Mr. Scott McDonald and Ms. Lisa DeVos, while completing their pharmacy studies assisted in numerous research activities including training manual preparation, pharmacist orientations, survey data collection and data analysis. My secretaries, Kathy Smart and Lynne Moser, helped in the preparation of the many drafts of the dissertation. Dr. Wei-Ching Chang was my statistical advisor. The interest and support of the Alberta Pharmacy Economics Committee were critical to this research. The financial assistance from the Alberta Pharmaceutical Association and the support from all the staff allowed me to work part-time and complete the research. Finally, thanks to Ms. Barbara Barber, Mr. Perry Dorgan and the staff of the Alberta School Employee Benefit plan, for the financial support and help in the research.

GLOSSARY OF TERMS

This glossary of terms is intended to define terms as they are used in the dissertation.

Adjudication – The processing of a prescription claim through a series of edits to determine the proper payment (adapted from Ito and Blackburn, 1995)

Bundled fee – A single fee for a bundle of services aggregated together for payment.

Cognitive service – A service provided by a pharmacist that is either judgmental or educational in nature (American Pharmaceutical Association, 1989).

Dispense – To provide a drug pursuant to a prescription but does not include the administration of a drug (Pharmaceutical Profession Act, 1995).

Dispensing fee – The amount paid to a pharmacy for each prescription order dispensed.

Drug-related problem – An undesirable event, a patient experience that involves, or is suspected to involve drug therapy, and that actually, or potentially, interferes with a desired patient outcome (Strand, Ciprolle, Morley, Ramsey, Lamsam, 1990).

Mark-up – A percentage payment of the drug cost per prescription order dispensed, used to recognize the cost of maintaining the drug in inventory.

Pharmacist – An individual, other than a restricted practitioner, who is issued a certificate of registration under the Pharmaceutical Profession Act and who holds an annual certificate entitling him to engage in the practice of pharmacy pursuant to the Act and regulation (Pharmaceutical Profession Act, 1995).

Pharmacist intervention – An action by a pharmacist that is intended to alter the course of a drug treatment process.

Pharmacy – Physical facility used for the practice of pharmacy (Pharmaceutical Profession Act, 1995).

Professional fee – Fee charged by a pharmacy for dispensing (distribution) and cognitive services.

Third Party Payer – A public or private organization that pays for or underwrites coverage for health care expenses or another entity e.g. Assure and Blue Cross were third party payers for the Alberta School Employee Benefit Plan (adapted from Ito and Blackburn, 1995).

Trial prescription – A prescription that is dispensed in two parts – an initial quantity and, if appropriate, the balance is dispensed. The initial trial quantity of the medication is intended to see if the patient tolerates a specific drug without experiencing side effects that would make them stop the therapy (NPCMC, 1998).

Unbundled fee – A specific fee (separate from other fees) charged for specific services.

Usual and customary fee – A term referring to the commonly charged or prevailing fees for pharmacy professional services within a pharmacy or a geographic area (adapted from Ito and Blackburn, 1995).

Value-added service – A professional service that is not normally reimbursed as part of a dispensing fee.

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CHAPTER I

INTRODUCTION

An important relationship exists between pharmacists' practice activities and the proper use of drugs in our health care system. Drugs are the most common treatment intervention in the health care system. When their use is optimized in the treatment of medical conditions and diseases, they produce many beneficial economic, clinical and humanistic outcomes; however, there can be undesirable outcomes associated with sub-optimal use of drugs. Common examples are adverse reactions and high drug costs. The undesirable outcomes of noncompliance are significant to our health care system. Coambs et al. (1995) estimated that the cost of noncompliance is responsible for up to 10% of total health care spending and ranks the same as the sixth most expensive disease category in Canada (cardiovascular disease). The importance of drugs in our health care system is diminished when the outcomes associated with undesirable events offset the benefits of the positive outcomes. Pharmacists are in a unique position to optimize drug use and reduce undesirable health care outcomes. They are the primary distributors of drugs in our health care system and they are highly qualified to perform an expanded role in the education and monitoring aspects of the drug use process. Pharmacy clients are very satisfied with the current levels of professional services and the public places a high level of trust in pharmacists. Also, pharmacists are considered very accessible health care professionals and frequently offer the public their first contact with the health system.

The community pharmacist's ability to perform an expanded role has been limited by the lack of a patient focussed practice model for community pharmacy and a number

of other barriers[1]. As a result pharmacists' skills and abilities have been underutilized. Within the profession of pharmacy, this has been addressed through strategies such as the development of new practice models, increased practice research, continuing education programs, changes to the work environment, and new payment models. Outside of pharmacy there is a poor understanding of pharmacists' capabilities and limited interest in increasing their effectiveness. Unlike the field of medicine, there has been minimal interest by policy makers in influencing pharmacists' professional practice behaviour through reimbursement policies.

For most community pharmacists, major practice activities range from traditional dispensing to direct patient care services. Recently, pharmacy practice activities were categorized into four domains of activities: ensuring appropriate therapy and outcomes, dispensing medications and devices, health promotion and disease prevention, and health systems management (American Pharmaceutical Association, 1998). Dispensing activities can be delegated by pharmacists to technicians or can be performed by automated systems. Direct patient care activities are performed directly by pharmacists.

While dispensing services are the most frequent activity and are essential in the health care system increased attention is being paid to cognitive services (non-dispensing activities) by pharmacists and pharmacy organizations. These activities can have a positive effect on patient health outcomes through improved physician prescribing and better patient compliance.

It is reported by pharmacists that current reimbursement models do not adequately

[1] Raish (1993) has categorized the barriers as situational (working conditions and economic factors), cognitive (lack of knowledge or ability to perform service), legal (regulations for practice), and attitudinal (pharmacist beliefs about themselves and others).

or appropriately compensate them for non-dispensing activities (Pharmacy Practice, 1996). Furthermore, reimbursement is required for these activities to be performed to a greater extent. Pharmacists commonly refer to the new reimbursement models as "alternative reimbursement" for "cognitive" services. Policy makers and drug plan administrators may be interested in changing the current fee-for-service reimbursement model for cost containment reasons or they may be indifferent about changes. A recent Canadian survey of employers and private sector drug plan managers (Altimed, 1998) revealed no clear preferences for different reimbursement structures. The top two preferences of payers were payment structures that tie drug plan savings to reimbursement efforts and the current payment structures.

Conceptual Framework for Understanding the Effects of New Reimbursement Systems

The effect of reimbursement on health providers' behaviour has been conceptualized from different perspectives (Giacomini, Hurley, Lomas, Bhatia, and Goldsmith, 1996). The traditional behaviourist perspective is based on a reward-punishment theory that induces the right behaviour because of the health care providers' concern about the financial consequences of their actions. Usually rewards are provided for efficiency and quality, and punishments are given for waste and ineffectiveness. In the evaluation of new reimbursement models, the new financial incentive is the predictor variable and behavioural responses (processes and outcomes) the dependent variables. Unexpected responses or unmeasured behaviours are studied selectively as "side effects" in the behaviourist model. The model is weak in explaining the way the new

reimbursement model works in a contemporary health care environment.

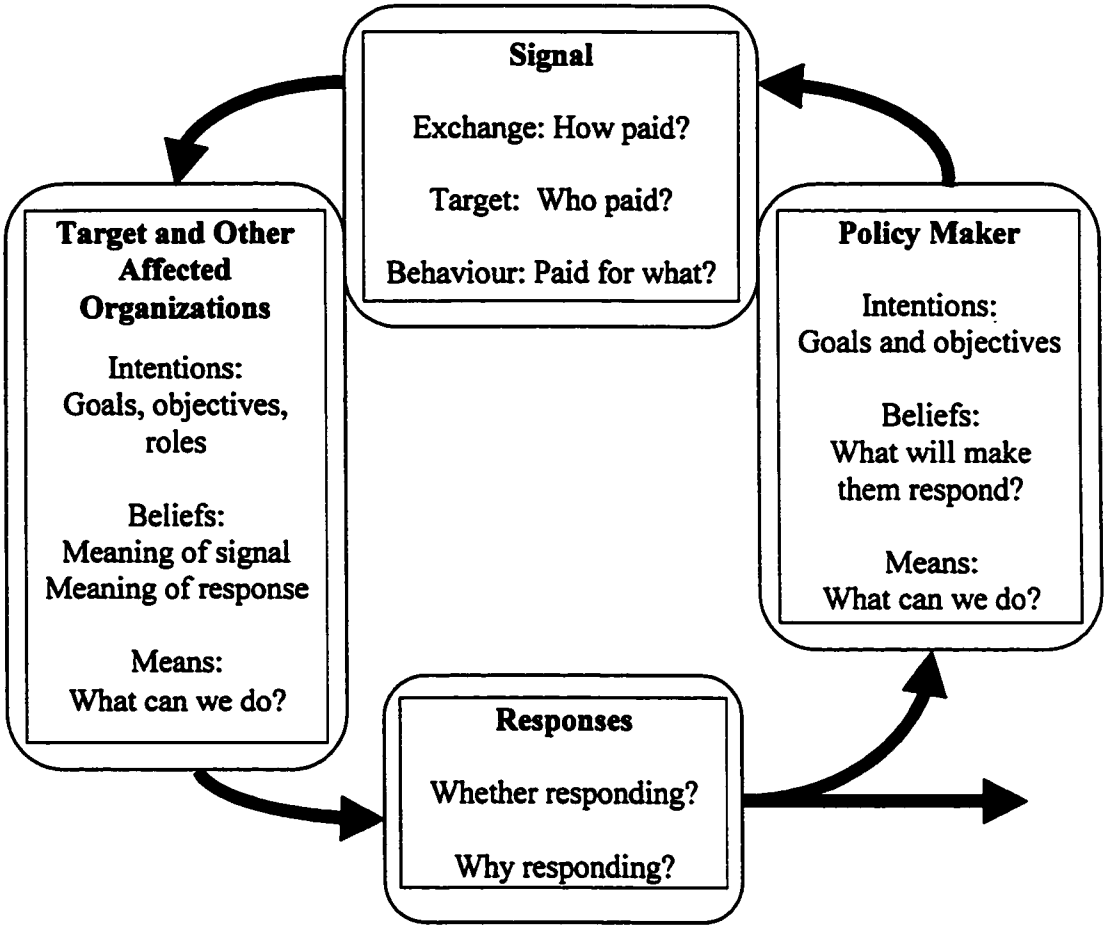
Communications Model

Giacomini et al.(1996) provide a communication model as a conceptual framework for understanding the effects of new reimbursement models in health care. The model supplements the behaviourist model by examining the meaning, interpretation and responses to new financial incentives.

The model draws on the disciplines of health economics and policy analysis. Theories from organizational behaviour, psychology, policy analysis, management and economics were incorporated. It was developed to understand how intended financial incentives work within the social and institutional context of the Canadian health system. The model has been used successfully to examine seven financing innovations in the Canadian health care system. The work was done for the Financial Incentives Project and conducted through the Center for Health Economics and Policy Analysis at McMaster University.

The model assists in understanding the meaning of, interpretation of, and responses to financial incentives. The key premise of the model is that context must be carefully considered when designing a funding scheme. Funding changes alone will not carry reforms in the absence of legal and institutional structures. The "communications model" of financial incentives is shown in Figure 1.1. The following is an explanation of the model in simple terms. First, the policy maker sends a signal by making a funding change. Second, the target and other affected organizations interpret the signal. Third, a response by the organization is observed through its behaviour. Finally, the loop is closed when key stakeholders view the signal and respond.

Figure 1.1 "Communication Model" of Financial Incentives



Adapted from The Many Meanings of Money: A Healthy Policy Analysis Framework for Understanding Financial Incentives (p. 8) by M. Giacomini, J. Hurley, J. Lomas, V. Bhatia and L. Goldsmith, 1996.

The authors summarize their rationale for the model as follows:

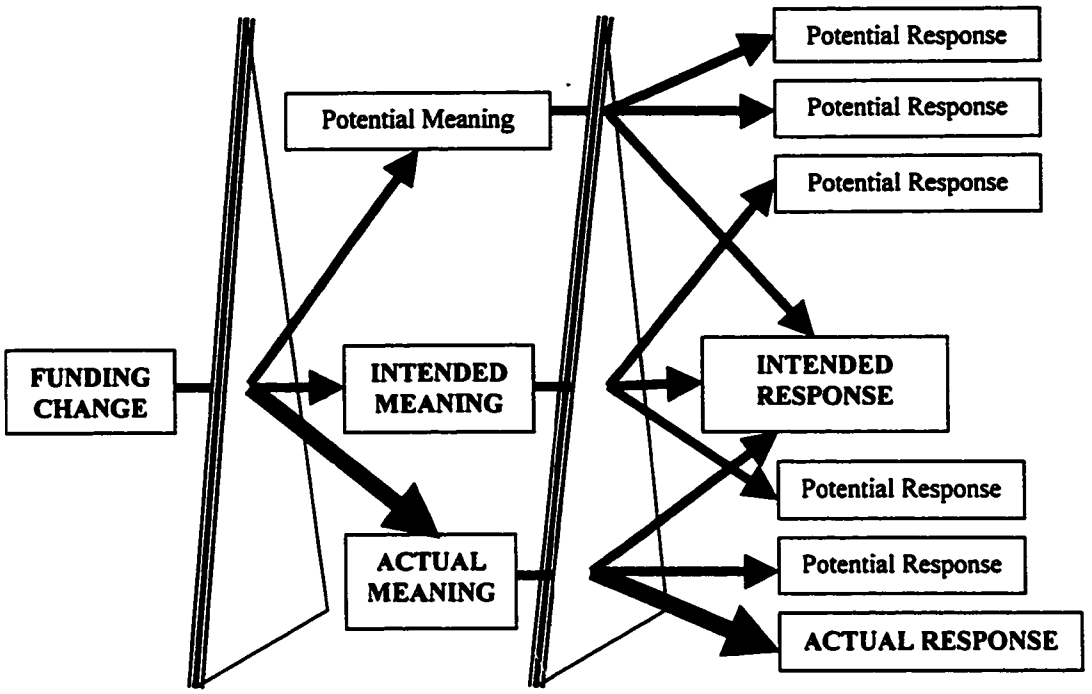
"... we expect organization responses to funding changes to be interpretive, strategic, and perhaps in some cases to defy 'rational,' instrumental explanations... . Further, we can expect the interpretation and response process to vary across different types of organizations. Different stakeholders will bring different interests, beliefs, ideologies, power, institutional roles, ways of knowing, information, intrinsic motivations, and

decision making processes to bear on these interpretation and response processes."

A funding change signal has a message and the message has at least three features: what is being paid for (the behaviour), who is paid (the target) and how payments are made (the exchange). More than one of the three features can be intended in a single policy. What is being paid for or the basis of payment is usually linked to the target organization identity, outputs and responsibility. The target, or who is paid, can be an organization, an extra-organizational collective or intra-organization members. Within pharmacy, the term "organizations" could include chain pharmacy corporations and independent pharmacies. Important elements of the exchange or how payments are made, include the quantity (size of gain or loss), direction (positive or negative), timing (prospective or retrospective), and the formula and calculation (i.e., unit of payment, precision and accuracy, transparency). Within the affected organizations, responses to funding changes are not usually reflexive but strategic. Two strategic processes potentially occur in the organization i.e., interpreting the policy signal and formulating a response. The processes are not necessarily sequential and may overlap. The interpretation process turns the funding change into an incentive that is turned into a behavioural change. When interpreting and responding, the organization considers its beliefs (the meaning given to signal and response); its intentions (the organization's mission, goals and objectives); and its means (what can be done).

A prismatic effect is used to describe how a funding change is translated into a response. Figure 1.2 shows this effect.

Figure 1.2 Prismatic Effect of Funding Changes, Meanings and Responses



Adapted from The Many Meanings of Money: A Healthy Policy Analysis Framework for Understanding Financial Incentives (p. 37) by M. Giacomini, J. Hurley, J. Lomas, V. Bhatia and L. Goldsmith, 1996.

The figure is intended to show the following. First, a funding change can be redirected into a wide array of meanings and responses. When the funding change objectives are unclear or there is a major variation in how stakeholders view the objective the potential for redirection is high. Second, the relationship between different policy interpretations and responses may crossover or overlap. Stakeholders may see an intended response but for the "wrong reason". Conversely, an unintended response may be seen for the "right reason". Third, even the most precise financial signal can be interpreted widely. Because of the prismatic effect, the major challenge is to create a "lens-like" focus to support the financial change.

Purpose and Objectives

The purpose of the research was to examine whether pharmacist cognitive activities, drug utilization and costs were affected by a new reimbursement model. The research examined pharmacists' perceptions about the reimbursement model, and how the reimbursement model worked within the context of the communication model. The initial phase of the research was an experiment which tested the assumption that the new reimbursement model would provide sufficient incentive to increase cognitive service activities, and this in turn would result in decreased drug utilization and drug costs. Pharmacists' opinions and preferences would be examined to determine the most desirable components of an effective reimbursement model.

The research focus changed as the interim results from the experiment became known. Few documented interventions and a negligible effect from the financial incentive required a greater explanatory component be added to explain the unexpected results from the experiment.

The specific objectives of the research were as follows:

(1) To determine (a) if a new payment model changed how often (and the mix of) cognitive services are provided, (b) whether the cognitive services reduced drug utilization, and (c) whether the additional pharmacy payments were offset by reductions in drug costs;

(2) To identify individual pharmacist's perceptions with respect to payment model design obstacles, the impact of the payment model on practice, and their understanding of the value-added concept; and

(3) To describe using the communications model (a) the pharmacy payments as a

"signal", (b) the perspective and process which generated the "signal", (c) the affected organizations with respect to their interpretations and responses to the "signal".

Two of the objectives shown were modified from the initial research plan. The original intent for objective #2 was changed to specifically identify important extraneous project design and operational variables. Objective #3 was added to increase the explanatory power by providing a framework developed for examining assumptions implicit to implementing new reimbursement models.

Hypotheses and Major Research Questions

Two hypotheses were developed based on initial reports from an American research project, which suggested that provision of pharmacist cognitive services were affected by financial payments (Christensen, 1996); and from research which suggested that clinical pharmacy services reduce drug utilization (e.g., Hatoum and Akhras, 1993).

Hypothesis 1 – There will be no difference between control and test groups (receiving payment for cognitive services); (a) in the frequency of cognitive services provided, and (b) in the mix of cognitive services provided.

Hypothesis 2 – For the cognitive services provided, there will be no difference between control and test groups; (a) in the number of drugs ordered compared to the number dispensed, and (b) in the mix of drugs ordered compared to the mix dispensed.

A third hypothesis was based on the supposition that payers and policy makers will be interested in cost neutrality for pharmacy payment programs.

Hypothesis 3 – For the cognitive services provided, there will be no difference between control and test groups in the net cost (drug cost savings minus cognitive service

payments).

For the descriptive research, general research questions took the place of hypotheses. The following three general research questions were developed for pharmacist interviews.

(1) Does the project design (e.g., training and reference materials) or the new reimbursement system (e.g., the documentation form) create perceived obstacles to the pharmacist in providing cognitive services?

(2) Does the new reimbursement model affect specific practice activities (e.g., performing more interventions, documenting more interventions, spending longer time on interventions, looking for certain drug-related problems, and changing behaviour from dispensing to non-dispensing)?

(3) To what extent do pharmacists share a common understanding of the concept of value-added services as the basis for cognitive services reimbursement?

Two major research questions were addressed in the case study.

(1) What policy making process produced the new financial incentive and what were the features of the incentive?

(2) How do affected organizations interpret this financial incentive and respond in ways that might give insight into its "incentive" properties?

Significance

This research adds some pharmacy information to the growing body of knowledge on the effect of financial incentives on practice behaviour. The research provides new quantitative and qualitative information about community pharmacy and pharmacists'

responses to alternative reimbursement. Policy makers, pharmacy leaders and pharmacy practice researchers will be able to use the evidence in the design, implementation and evaluation of new reimbursement models. Policy makers, payers, pharmacy leaders and the public will have a better understanding about the effect of financial incentive signals in pharmacy. In addition, the approach places a new pharmacy reimbursement model into a framework that can be generalized for policy makers.

The research replicates similar American research in a Canadian setting and a different patient population. Also, the research helps to determine the relative importance of reimbursement compared to other factors for influencing pharmacist practice behaviour.

Organization of Dissertation

The balance of the dissertation is structured into six chapters as follows. Chapter II consists of a literature review. In Chapter III the methodologies are presented. Chapter IV presents the results of the research. In Chapter V, the findings and limitations are discussed. Finally, Chapter VI presents the conclusions and recommendations.

CHAPTER II

REVIEW OF THE LITERATURE

The literature review is divided into three sections. The first section reviews drug related problems and the pharmacist, examines changes in pharmacist roles and practices, discusses reimbursement as a barrier to particular practice activities, and evaluates pharmacy practice. The second section reviews pharmacy financial incentives in different pharmacy and pharmacist payment systems. In the third section, pharmacy, pharmacist, and other healthcare provider responses to financial incentives offered by the various payment systems are discussed.

Drug Related Problems and the Pharmacist

Drug problems such as toxic overdoses (either intentional or unintentional), and adverse effects and inappropriate use (i.e., not enough or the wrong drug) result in hospital admissions, extended hospitalizations and other use of health care services. Manasse (1989) coined the term "drug misadventuring" for iatrogenic hazard or incidents associated with drug use. Between 5.9 - 22.3% of all hospital admissions are claimed to be due to drug-related problems (see Manasse). From a meta-analysis of 36 international studies, Einarson (1993) found that 5.1% of all hospital admissions resulted from adverse drug reactions. In community and ambulatory settings, the range of adverse reaction rates to drugs have been reported as 1.7% to 50.6% (see Manasse). In the two largest two community studies, the rates were 1.7% and 2.2%. It would appear that half of all drug-related problems are preventable (Hepler and Strand, 1990).

The economic consequences of unresolved or unrecognized drug-related problems can be significant. Johnson and Bootman (1995) developed a cost-of-illness model to estimate the costs associated with drug-related morbidity and mortality in ambulatory settings in the US. Health care utilization and costs for drug-related problems were predicted for consequences including physician visits, additional prescriptions, emergency department visits, hospital admissions, long-term care admissions, and deaths. A figure of $76.6 billion US was estimated as the annual cost of drug-related morbidity and mortality.

Patient noncompliance with drug therapy affects health status and increases health system costs. Coambs et al. (1995) reviewed relevant scientific literature and estimated the costs of noncompliance in Canada. Their definition of noncompliance was broad and included situations of inappropriate use. They estimated that 33% of patients either do not obtain their prescription medications or do not take them. Nearly 17% do not take their medication as prescribed. Overall, approximately 50% are noncompliant with medical instructions. The authors calculated the economic costs of noncompliance in Canada as $7 to $9 billion dollars annually in 1993.

Increases in drug expenditure are a cause of concern for health care payers and policy-makers. In Canada, increases in most categories of health care expenditures (hospitals, physicians) stabilized or decreased while drug expenditures increased by 26% over the period 1990-1994 (Canadian Institute for Health Information, 1997). Pharmaceutical expenditures have been higher in the private sector than in the public sector. Expenditures for drugs account for over 30% of the total per capita health expenditures in the private sector. Total expenditures for prescription and

nonprescription drugs in Canada were $9.3 billion in 1995 (excluding those used in hospitals) and they accounted for 12.5% of national health expenditures. These increases are causing governments, employers and insurers to consider managed care strategies as a solution to rising drug plan expenditures. It is interesting to observe that the upper end of the range for estimated costs of noncompliance is nearly equal to the total annual expenditures for drugs in Canada.

Systematic reviews have been performed of strategies or interventions to improve compliance and reduce inappropriate utilization. The strategies identified by Coambs et al. (1995) to improve compliance are health education, use of compliance devices, and the use of compliance education material and other information sources. Coambs et al. suggested compliance management programs for asthma and hypertension provided by pharmacists, as potential strategies. Tamblyn and Perreault (1997) reviewed research evidence on interventions to control prescription utilization, costs and health care provider's behaviour. The types of interventions were health care system interventions, physician-based interventions, pharmacist-based interventions and patient-based interventions. Specific pharmacy interventions identified included institution based pharmacist drug reviews and consultations, and pharmacy initiatives to improve patient compliance. Morgan (1997) assessed a number of strategies for drug benefit managers to control costs and improve drug utilization. The five targets for strategies were: consumers, pharmacists, physicians, manufacturers and the overall health care system. Two approaches aimed at the pharmacist were; incentives for efficient retailing and drug cost reimbursement. The pharmacy interventions and strategies identified in the two reports (Tamblyn and Perreault; Morgan) are either institution-specific or focussed on the

drug distribution process. They are not intended to promote the use of the community pharmacist's cognitive skills by improving drug use.

Changes in Pharmacist Roles and Practice

Pharmacists have traditionally played a key role in primary health care; a role focussed on medication-related services. However, the role of the pharmacist is evolving. Along with services directly related to medications, pharmacists are increasingly providing a number of non-traditional professional services. Pharmacists participate in the medication management of chronic diseases such as diabetes, hypertension, asthma, and high blood cholesterol; provide self-care counselling; select drugs under protocol; and provide general health education and promotion. Pharmacists are providing counselling on smoking cessation, the treatment of common diseases and injuries, family planning and nutrition (American Pharmaceutical Association, 1994a).

Two recent surveys of pharmacists and consumers illustrate the supply and demand for this changing role in Canada. The Pharmacy Post (1997) surveyed 593 pharmacy owners and managers in Canada to estimate the prevalence of pharmacies providing various types of services. The results showed that pharmacies are becoming health care centres. For example, nearly two-thirds of pharmacies surveyed provided in-store blood pressure monitoring. Other services pharmacies provided were: in-store educational seminars and programs (50%), disease state management programs (40%), patient callbacks (38%), out-of-store educational seminars and programs (31%) and home visits (24%). The survey did not request details about the quality of services provided, the frequency of service provision, or whether a pharmacist or nurse provided the service.

More than one-third of pharmacies reported having pharmacists specialized in diabetes care, alternative therapies, asthma care, specialty compounding, hypertension, or home infusion services (Pharmacy Post, 1997). A consumer survey (Altimed 1997) measured demand for various pharmacy services. A random sample was taken of 1,241 adult consumers from across Canada. Over one-third of the respondents stated they would find the following pharmacy services useful: specialty home services for terminally ill patients, blood glucose level monitoring, cholesterol monitoring, and counselling on disease conditions.

Pharmaceutical Care

The profession of pharmacy has embraced a new practice paradigm—pharmaceutical care. While the pharmaceutical care concept is supported by many national and provincial pharmacy organizations and pharmacy opinion leaders, pharmacists struggle to define and implement the model in daily practice.

Hepler and Strand (1990) defined the concept of pharmaceutical care as "... the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life. These outcomes are (1) the cure of a disease, (2) the elimination or reduction of a patient's symptomatology, (3) the arresting or slowing of a disease process, and (4) the prevention of a disease or symptomatology." An additional key component of pharmaceutical care is pharmacist documentation of services provided, both for purposes of continuity of care and reimbursement.

Pharmaceutical care is the process in which pharmacists take a leadership role in a partnership with the patient and other health care providers, in designing, implementing

and monitoring a therapeutic plan that produces specific health outcomes for the patient. Drug-related problems are identified, resolved and prevented through the development of a care plan or a standardized work-up of drug therapy, similar to the nursing care plan. Implementation of pharmaceutical care requires that pharmacists re-orient their practice focus from the product (and process) to the patient (and patient outcomes).

Pharmacy organizations are in the process of reorienting pharmacy practice and pharmacy information systems to facilitate pharmaceutical care. Many pharmacy organizations have adopted the pharmaceutical care concept in their vision, mission, and philosophy statements. Pharmaceutical care provides a base for standards of practice, pharmacist role statements and scope of practice documents. The process for providing pharmaceutical care is being taught in pharmacy undergraduate curricula and in pharmacy continuing education programs.

The combination of new opportunities for an expanded pharmacist role and the diffusion and acceptance of the pharmaceutical care model have exposed a major deficiency in existing pharmacy reimbursement systems. Current reimbursement systems are product focussed while new practice models are patient focussed.

Barriers to Implementing Pharmaceutical Care

Pharmacists' implementation of the pharmaceutical care model has been slowed by a number of barriers. Researchers, seeking to understand why it is a struggle for pharmacists to implement pharmaceutical care, have surveyed practicing pharmacists for clues. These surveys have consistently identified the lack of reimbursement for cognitive services as a barrier to the implementation of pharmaceutical care.

In an early review, Knapp (1979) identified four categories of barriers to the provision of cognitive services: cognitive, situational, legal and attitudinal. Cognitive barriers identified included both a lack of knowledge and difficulty identifying when and how to use knowledge. The situational barriers were the community pharmacy reimbursement system, the time required to provide professional services, poor physical pharmacy design, and lack of complete patient information. Extensive and overly specific regulations comprised the legal impediments. Pharmacist attitudes about patients, physicians and themselves made up the final category.

Raisch (1993) surveyed 73 US pharmacists in the state of New Mexico about their perceptions of barriers to providing cognitive services in the community. Perceived barriers to counselling included excessive workload, lack of privacy, patient attitudes and store layout. Perceived barriers to physician interactions included difficulty contacting them, negative physician attitudes toward pharmacists' recommendations, excessive workload, and inadequate patient information. Significantly, a lack of financial incentives ranked sixth position as a barrier to both counselling and physician interaction.

Rural West Virginia pharmacies were surveyed to assess the influence of facilitators and barriers on the provision of pharmaceutical care (Venkataraman, Madhavan and Bone, 1997) with 162 pharmacy managers responding to a written questionnaire. A seven-point Likert scale was used to measure the extent to which pharmaceutical care services were provided, and the influence of barriers and facilitators on the provision of pharmaceutical care. The perceived extent of provision of pharmaceutical care was captured by four dependent variables: drug-related problem identification and solving, patient communication, drug therapy monitoring, and

obtaining and maintaining patient information. The four independent variables addressing barriers were reimbursement, availability of time, employer support, and physician attitude. The four independent variables addressing facilitators were legal liability, pharmacist attitude, pharmacist confidence, and patient attitude. Respondents reported a lack of reimbursement as a minor barrier. The results of structural equation modeling showed that lack of reimbursement (barrier) and pharmacist's confidence (facilitator) had the greatest impact in the provision of pharmaceutical care. The researchers' explanation for the apparent contradictory findings was that pharmaceutical care was provided regardless of reimbursement.

Berger and Grimley (1997) surveyed pharmacists (n = 148) attending the 1996 American Pharmaceutical Association annual meeting to assess readiness to render, and barriers to providing, pharmaceutical care. The questionnaire was based on the transtheoretical model of change, which describes behavioural change in five progressive stages: precontemplation, contemplation, preparation, action and maintenance. Four key pharmaceutical activities were assessed within the model of behaviour change: patient assessment, patient follow-up, documentation of care provided, and submitting documentation for compensation. Overall, the majority of pharmacists fell into the precontemplation and contemplation stages of change. The results revealed differences in pharmacists' readiness to provide the key pharmaceutical activities measured. Eighteen percent of pharmacists were prepared to conduct a comprehensive patient assessment and 13% were prepared to follow-up with patients; however, 8% were prepared to document care provided and only 3% were prepared to submit documentation for compensation from third party payers. The survey revealed that while pharmacists are becoming more

comfortable with the provision of patient-focussed services, there was a lag in the other key components of pharmaceutical care, documentation and claiming for services provided.

Surveys of pharmacists have identified reimbursement as an important, but not the pivotal barrier to the provision of pharmaceutical care. The important barriers are excessive workloads, difficulty contacting physicians and poor employer support. Indeed, the proliferation of non-traditional patient services such as disease management programs illustrates that pharmacists are willing to provide these patient-focussed services without reimbursement. There is a need to confirm the importance of reimbursement as a barrier to patient-focussed services.

Evaluating Pharmacist Practice

Pharmacist interventions with physicians and patients are primarily directed at improving prescribing practices and boosting patient compliance. The potential impact of pharmacist interventions can be explained by adult learning and communication theory and behavioural theory models (Lipton, Byrns, Soumerai and Chrischilles, 1995). Specifically, pharmacists (a) have credibility as an expert consultant; (b) can provide an inoculum against counter-arguments by presenting both sides of a controversial issue; (c) can provide two-way, active-learner involvement through interaction; (d) can suggest alternative behaviours; and (e) use message repetition and reinforcement to sustain learning and reduce the probability of errors due to oversights. A number of evidence-based reviews of the effectiveness of pharmacy interventions have been conducted in ambulatory settings. The term "ambulatory" refers to an outpatient or community setting.

Hatoum and Akhras (1993) reviewed published studies on the value and acceptance of pharmaceutical services provided by pharmacists in ambulatory settings. A MEDLINE search was conducted for the period 1960 to 1992. Articles were included if actual research data was presented on the impact of pharmaceutical services on outcomes such as cost of patient care, quality of patient care, or acceptance of patient-oriented pharmacy services. Studies assessing institutional pharmacy services were excluded. A total of 104 articles were examined: 47 (45.2%) reported positive outcomes, 20 (19.2%) negative outcomes and 37 (35.6%) no effect. Twelve of 47 studies with positive outcomes reported reductions in the costs of care, and of these studies; five reported drug cost savings or cost avoidance.

Two recent reviews of the outcomes of pharmacy practice included both institutional and ambulatory settings. Rupp and Kreling (1994) reviewed 21 studies assessing the outcomes of pharmaceutical care or pharmacist interventions. Less than half the studies were in a community or ambulatory setting. Poor research design was a limitation of the literature. Three of 21 studies showed a reduction in the total number of prescriptions in ambulatory settings because of the pharmaceutical care provided. Schumock, Meek, Ploetz and Vermueulen (1996) summarized and critiqued 104 economic assessments of clinical pharmacy programs in two major databases (MEDLINE and International Pharmaceutical Abstracts) for the time period 1988 to 1995. The types of clinical programs reviewed were target drug programs, general pharmaco-therapeutic monitoring, pharmaco-kinetic monitoring and disease state management programs. Articles were included if the clinical service included a patient-level interaction, with or without a policy-level intervention. Only 23% of the studies were carried out in

ambulatory or community pharmacy settings (most were ambulatory clinics). A total of 93 of 104 studies showed cost savings or cost avoidance. Drug cost avoidance was the most common outcome in 80 of 104 studies. Two studies evaluating clinical pharmacy services in clinic settings showed benefit to cost ratios of 3.2:1 and 4.3:1. The results from the two reviews showed that pharmacy programs in ambulatory settings can reduce drug utilization and result in drug cost avoidance.

Bero, Mays, Barjesteh and Bond (1997) critically reviewed literature from 1966 to 1995 to evaluate the impact of expanded outpatient pharmacists' roles on health services utilization, the costs of health services, and patient outcomes. EPOC, MEDLINE, EMBASE, PHARMLINE, and International Pharmaceutical Abstracts were searched. Studies were included if they met specific design, comparison, intervention, and outcome criteria. Only 14 studies met the inclusion criteria, with 12 of 14 studies having a randomized controlled trial design. The major findings were as follows. Processes and outcomes of pharmacist care showed slight improvement or no difference from outcomes of physician care. Pharmacist services directed at patients decreased the use of non-scheduled health services and improved patient outcomes compared to no intervention. Interventions delivered by pharmacists were not as effective as those delivered by physicians. Pharmacist interventions directed at physicians improved prescribing and decreased associated drug costs, but their effect on other outcomes is unknown.

In summary, while quantitative evaluations suggest that pharmacist activities in ambulatory settings reduce costs, improve quality of care and are well accepted, there are few such studies for community pharmacy and most are distinguished by weak research design and methodology. The reviews suggest that community pharmacists can decrease

inappropriate prescribing and improve patient compliance.

Intervention Studies

Intervention studies are used to measure the process of pharmacist practice. The three elements used to characterize process are the quantity and kinds of activities, their quality and appropriateness, and their meaning (McKay, Hepler and Knapp, 1987). A critical requirement for conducting intervention research is that each pharmacist service be documented. As a minimum, documentation of the reason for the service, the nature of the service and the result of the service are required. An analysis of this documentation can reveal frequencies, mix and quality of services, and consequences. Criteria may be applied a priori or post hoc to evaluate the services. Depending on the type of study, it is common to collect information about the patient, pharmacist, date of service, prescriber, and drug(s) for each intervention. Intervention studies are a common technique to evaluate community pharmacy practice. Drug utilization studies and economic analyses are often performed in conjunction with intervention studies.

An early intervention study documented the prescribing-related interventions performed by community pharmacists during the prescription screening and dispensing process (Rupp, Deyoung and Schondelmeyer, 1992). Prescribing problems and subsequent pharmacist actions were described and evaluated. Pharmacy students documented pharmacist activities in 89 community pharmacies from five states over a five-day period. The results showed that pharmacists intervened in 1.9% of new prescription orders (median rates were used). Pharmacists dispensing lower volumes of prescriptions intervened at statistically significant higher rates compared to those

dispensing higher volumes. Incomplete prescription orders comprised 45.6% of problems; incorrect or inappropriate prescription orders comprised 36.4% of the interventions. The remaining 17.8% of the problems were drug interactions and other problems (e.g., patient questions or concerns). In 42.4% of cases, the pharmacist clarified the perceived problem and dispensed the prescription and, in 41.4%, the prescription order was changed. In 16.2%, the prescription was dispensed unchanged or not dispensed at all. A team of evaluators consisting of an internist and two clinical pharmacists ruled that in 28.3% of the cases the prescription could have caused harm to the patient if there had not been an intervention.

In a follow-up report, Rupp (1992) estimated the economic value created by pharmacists in the study. A three-person physician and pharmacist evaluation panel identified the consequences, estimated the probability of harm, and estimated the intensity of medical care from the 28.3% of potentially harmful interventions. The costs were calculated for potential emergency room visits, hospitalization and physician visits, based on average charges. The key finding from this work was that pharmacists' interventions produced an estimated cost avoidance of $76,615 total or $123 per patient case.

In Canada, a major national study of community pharmacist interventions has been performed, the Community Pharmacist Intervention Study (Poston, Kennedy and Waruszynski, 1995; Loh, Waruszynski and Poston 1996). The major objective of the study was to determine the incidence and scope of interventions and advice provided by community pharmacists on the supply and use of prescription and non-prescription medications. In addition, the study estimated the benefits of pharmacist interventions in economic and health care terms. The study methodology involved a national random

sample of pharmacist interventions from 681 community pharmacies over two individual two-week periods. A combination of self-reporting and observation techniques was used. An economic model was developed to determine prescription cost savings and physician fee avoidance from pharmacist interventions. The major findings of the study were that pharmacists intervened in two percent of new prescriptions (mean rate). For prescription drugs, the drug-related problems detected by pharmacists were categorized into drug distribution and supply (38.8%), therapeutic (36.9%), patient information (10.4%), and others categories e.g., drug interactions (13.9%). The results of pharmacist interventions were; changed and dispensed the prescription (56.3%), dispensed the prescription as written (36.6%), and did not dispense the prescription (7.1%). Prescription interventions resulted in estimated savings of $5.90 per prescription. When prescription costs and physician fees were projected, the estimated savings per intervention increased to $16.74.

A number of other investigators in Canada, United States and United Kingdom have determined pharmacist intervention rates (Dobie and Rascati, 1994; Fielding, Hill, Stratton and McKelvey, 1994; Lopatka and Bachynsky, 1995; Fincham and Hunter, 1996; Knapp, Katzman, Hamright & Albrant, 1998). Reported pharmacist intervention rates from North American studies were between 0.7 and 4.5 interventions per 100 prescriptions (mean rates were used). Two of the studies (Dobbie and Rascati, 1994; Fielding et al., 1994) were conducted in four or five pharmacies and were limited to new prescriptions. Their respective intervention rates were the lowest and highest, 0.7% and 4.5%. Lopatka and Bachynsky found a mean rate for new and refill prescriptions of 2.7% from 493 community pharmacies. In two United Kingdom studies (Greene, 1995a and b) both new and refill prescriptions were included and the intervention rates were 0.062 -

0.066% (mean rates were used). Knapp et al. (1998) determined actual and benchmark intervention rates for 31 California pharmacies dispensing MediCal prescriptions. An actual mean intervention rate of 0.7% of prescriptions was determined and a benchmark intervention rate of 4% suggested.

Two pharmacy reimbursement system research projects (McCormack, Reinhardt, Hastings and McGuirt, 1996; Christensen and Holmes, 1996) measured interventions as an indicator of pharmacy practice change.

Pharmacy Reimbursement Systems

A hand search was conducted of the Alberta Pharmaceutical Association (Alberta Pharmacy Economic Committee) library and internal files for references about pharmacy reimbursement systems. The library contains copies of pharmacy agreements and claim procedure manuals for use with third party payers, published and unpublished reports about pharmacy payment systems, and copies of articles from pharmacy trade journals about payment systems. Similar collections of materials exist in each provincial pharmaceutical association. The library contained information back to 1990.

Reimbursement systems for pharmacy services are distinct from those of other health care professionals because, traditionally, reimbursement for professional pharmacist services has been linked to product reimbursement. Historically, compounding labour costs and ingredient costs were not individually determined except where unusual or expensive items were used (CPhA, 1971). Rather, an average prescription price was set and adjusted only for quantity. With the introduction of mass-produced pharmaceuticals, prescription pricing was based on ingredient cost plus a

percentage mark-up. As manufactured products proliferated, inventory carrying costs and other issues stimulated a rethinking of the prescription pricing system.

In the early 1950s a "nominal" dispensing or breakage fee of $0.25 - $0.75 was added to the mark-up to handle increased handling expenses from unused portions of drug packages and extra tasks to be performed by the pharmacist. The cost of the product remained the major determinant of pricing, with the service costs being a minor consideration. During the 1960s interest grew in abandoning the mark-up reimbursement system and moving to a fixed professional fee for prescriptions.

Two principles underlay support for the introduction of a professional fee. First, a prescription is not a "trade good"; rather, it is intended for a specific person and cannot be re-sold as an article of trade. Second, the services rendered in dispensing are professional in nature and require specialized knowledge and judgement; moreover, neither the service cost nor the extent or quality of skill and judgement involved are related to the cost of ingredients used. The concept gained support with pharmacy audiences and external stakeholders in both Canada and the United States. In the Commission on Pharmacy Services Report the following recommendation was made: "that the cost plus professional fee method for determining prescription charges be officially recognized and advocated by the Canadian Pharmaceutical Association and its constituent and affiliated bodies" (CPhA, 1971). The professional fee was accepted by the provinces in their drug benefit programs and continues as the predominant payment system.

As with other health care providers, the basic reimbursement systems for professional services are fee-for-service, capitation, salary and mixed models (Lopatka, 1997). The following is an overview of the basic models in pharmacy reimbursement.

Fee-for-Service Reimbursement Models

The fee-for-service model, where payment occurs for each pharmacy service provided, dominates community pharmacy reimbursement. An estimated 99% of the reimbursement received from private and public drug benefit plans is made on a fee-for-service basis (Lopatka, 1997).

The present fee-for-service model has three components: drug product cost, distribution cost (mark-up), and the professional fee. The following general payment formula illustrates the three components and is standard in most provinces and states.

TOTAL pharmacy payment = drug product cost +

distribution cost (mark-up) + professional fee.

Drug product costs are defined a number of different ways. Actual acquisition cost (AAC) is based on invoice costs from the suppliers less discounts, rebates, or credits. Third party payer agreements with pharmacies place wholesaler mark-up limits for acquisition costs, ranging from seven to 15%. Maximum allowable price (MAP) or cost (MAC) is an established price level, independent of acquisition costs, which a pharmacy will be reimbursed at. Best available price (BAP) is defined as the lowest amount for which a specific drug preparation can be purchased. Provincial drug plans commonly use combinations of drug product cost definitions (see Table 2.1).

In the US, drug product costs are commonly defined as average wholesale price (AWP). The AWP is a list price based on wholesales' price lists. It is often 15% above the pharmacy AAC; it is common, therefore, for US pharmacies to be reimbursed by drug plans at AWP minus 10 or 15%.

The distribution cost (costs of medication acquisition, storage, handling, and

overhead costs) is commonly covered by a mark-up. In Canada, half the provincial drug plans allow a mark-up on ingredient costs. Mark-ups may be either fixed or variable percentages. Fixed percentage mark-ups are commonly 10 to 30% of the manufacturer's listed drug cost. Variable mark-ups tie the percentage mark-up to the drug ingredient cost. For example, drug costs between $40 and $80 would be allowed a 20% mark-up; while drug costs above $80 would be allowed only a 10% mark-up. Table 2.1 summarizes the definitions of drug costs and mark-ups currently used in provincial drug benefit plans in Canada (adapted from CPhA, 1997).

Table 2.1 Provincial Drug Plan Definitions of Drug Costs and Mark-up

Provincial Drug Benefit Programs	Cost Reimbursement			
	Actual acquisition cost (AAC)	Best Available price (BAP)	Maximum allowable cost (MAC)	Mark-up on product
British Columbia	Yes	NA	Yes	No
Alberta	Yes	Yes	Yes	No
Saskatchewan	Yes	NA	NA	10-30%
Manitoba	Yes	NA	Yes	Yes
Ontario	NA	Yes	NA	10%
Quebec	Yes	Yes	NA	No
New Brunswick	Yes	NA	Yes	No
Nova Scotia	Yes	NA	Yes	NA
Prince Edward Island	NA	NA	Yes	NA
Newfoundland	NA	NA	Yes	10%
Yukon	Yes	NA	Yes	30%
North West Territories	Yes	No	No	30%

The final component in the formula is the professional fee. Professional fees include reimbursement for both dispensing and non-dispensing (cognitive) activities. The dispensing component of the fee is for processing the prescription, preparing the product (repackaging, labeling) and dispensing the medication. In some provinces, where there is no mark-up, some allowance for distribution costs may be built into the professional fee through a multilevel fee. The cognitive service portion is intended to provide reimbursement for pharmacists' professional activities: patient assessment, counselling, education, teaching, and monitoring activities. The professional fee may be bundled or unbundled. With bundled fees, dispensing and non-dispensing activities are undifferentiated; rather, all service costs are packaged together for convenient billing. Most provinces use bundled fee systems, where typically a flat fee is added on to ingredient costs.

What a pharmacy is paid and what it charges may differ. The professional fee a pharmacy charges is usually determined from the average of fixed and variable dispensing costs. Most pharmacies have a "usual and customary" (U and C) fee. The U and C fee is set by a pharmacy to recover costs and make a profit. With bundled fees there is no fee differentiation for differing quantity or quality of services. Service costs are effectively averaged over all prescriptions. The primary pharmacy objective with this payment model is to improve efficiency by increasing the number of prescriptions dispensed. When a drug plan establishes a limit or cap on what it will pay for the professional fee, the pharmacy often charges the patient for the difference between its U and C fee and the amount paid by the drug plan.

Community pharmacy services have been classified into dispensing services,

dispensing-related valued-added pharmaceutical services, and other value-added pharmaceutical services (Christensen, Fassett and Andrews, 1993). The classification was based on whether the performance of the service was obligatory under existing reimbursement mechanisms. If the service was normally provided and reimbursed as part of the current professional fee, then the service was considered a routine dispensing service. Examples of routine services include accurately dispensing a prescription order, clarifying incomplete or illegible prescriptions, not dispensing orders that a reasonable and prudent pharmacist would recognize as containing obvious errors, and communicating drug use instructions to patients. If the service extended beyond routine dispensing tasks and cognitive activities normally provided and reimbursed as part of the dispensing fee, the service was a value-added pharmaceutical service. Examples of value-added pharmaceutical services include conducting drug regimen reviews to detect clinical problems, selecting appropriate drug products (i.e., generic or therapeutic substitution), training patients to use monitoring devices, conducting brown bag reviews, and providing academic detailing. The authors proposed a payment model which defines value-added as non-routine services and outside the standard bundled professional fee; eligible, therefore, for additional reimbursement.

Provincial drug benefit programs have added an unbundled fee-for-service component for value-added pharmacist (non-routine) services to their standard bundled professional fee system. The Quebec provincial drug program has unbundled fee-for-service programs in place: the pharmaceutical opinion and refusal-to-fill programs. These programs are the longest running cognitive services payment model in North America, having been in operation for more than 20 years (Poirier, 1996). The

pharmaceutical opinion is described as "an opinion by a pharmacist concerning the pharmacotherapeutic history of an eligible patient or concerning the therapeutic value of one or a combination of treatments prescribed". The opinion program was developed to provide a financial incentive for pharmacists to intervene in a patient's pharmacotherapy and promote optimal drug use. The program has undergone various modifications. In 1983, the program introduced the requirement that the pharmacist must identify a solution to a drug-related problem and eliminated the need to provide the patient a copy of the opinion. In 1992, four new opinion categories were added, an automated billing procedure was introduced, and a risk-sharing agreement was implemented. The pharmacy owners association (AQPP) and the government agreed to set aside 1% of the total pharmacy fees paid by the drug program to provide reimbursement for the opinions.

Compensation is provided for the following four categories of pharmaceutical opinions:

- drug-related problems such as allergies, side effects, patient intolerance, drug interactions, ineffectiveness, or contraindications in pregnancy or breast-feeding;
- non-compliance with antihypertensive medication;
- a review of a patient's medication profile with at least eight medications or an interaction between a non-prescription product and a prescribed medication; and
- a schedule for benzodiazepine withdrawal from a patient who has taken them for at least six months.

The refusal-to-fill program is another unbundled fee-for-service program. To be

eligible for reimbursement for refusing to fill a prescription, the following conditions must be met:

- the refusal must be based on scientific or therapeutic reasons;
- the reason must be written on the refused prescription;
- the refusal must be dated, signed by the pharmacist, and filed with other prescription orders;
- the refusal must involve a medication covered by the government drug program (RAMQ);
- once the prescription order has been refused, a pharmacist cannot file a subsequent claim for dispensing the medication
- if the medication to be dispensed is out of stock, the pharmacist cannot file a claim for a refusal to dispense; and
- if the patient attempts to refill a prescription order too soon, the pharmacist cannot claim a refusal to dispense unless the patient is over-using the medication.

The Quebec provincial drug plan added a trial prescription program in 1995 (Gariepy, 1997). The Quebec trial program encompasses the following therapeutic categories: antilipemics, angiotensin converting enzyme inhibitors, calcium channel blockers, non-steriodal anti-inflammatories, alpha-blockers, antidepressants, and seven other individual drugs. Trial prescription programs have been introduced in British Columbia, Saskatchewan, Nova Scotia, and the Yukon.

Unbundled fee-for-service programs are not as common in Canadian private sector drug benefit plans. One private sector adjudicator, Assure, pays unbundled fees

through its Platinum provider plan. The pharmacy benefit manager, ESI Canada, has developed cognitive services reimbursement models (Semelman, 1999). Pharmacists are paid a cognitive services fee of $10 for performing therapeutic drug interchanges, trial prescriptions, step therapy and medication management activities.

Table 2.2 shows the distribution of bundled and unbundled professional fees in the provincial drug benefit plans (adapted from CPhA, 1997).

Table 2.2 Provincial Drug Plan Professional Fees (Types and Amounts)

Provincial Drug Benefit Programs	Professional Fees				
	Maximum bundled dispensing fees	Trial Prescription a) trial portion b) balance portion	For refusal to fill a prescription	Cognitive Services and Intervention	On call service
British Columbia	$7.55	a) $7.55 (max) b) $7.55 (max)	2 times U+C fee paid for forgeries	2 times U+C fee	No
Alberta	$9.70 to $19.70	No	No	No	No
Saskatchewan	$6.93	a) $6.93 b) $7.50	Being considered	Being considered	NA
Manitoba	$6.01	NA	No	No	No
Ontario	$6.11	Being considered	NA	Being considered	NA
Quebec	$7.00	a) $7.00 b) $7.00	$7.00	$15.45	$22.48
New Brunswick	$7.40 to $160.00	NA	No	No	No
Nova Scotia	$8.39	a) $8.39 b) $4.20	No	No	No
Prince Edward Island	$7.85	NA	No	No	No
Newfoundland	$3.92	NA	$3.92	No	No
Yukon	$8.75	$8.75	No	No	No
North West Territories	$9.33	No	No	No	No

The following equation summarizes the unbundled payment formula for pharmacy.

TOTAL pharmacy payment = drug product cost +

distribution cost (mark-up)+ dispensing fee + cognitive fee.

In the United States, as in Canada, the bundled fee-for-service model is the most common pharmacy payment system (Braden, 1995; Rupp, 1996). Unbundled payments for cognitive services have been introduced by a number of private sector managed care companies and by public sector state plans in Washington, Wisconsin, Minnesota, New York, and Mississippi. For example, the Wisconsin Medicaid payment system is an unbundled five-level fee-for-service payment model (Whitmore, 1997). Reimbursement levels are based on the time spent by the pharmacist on specified pharmaceutical activities.

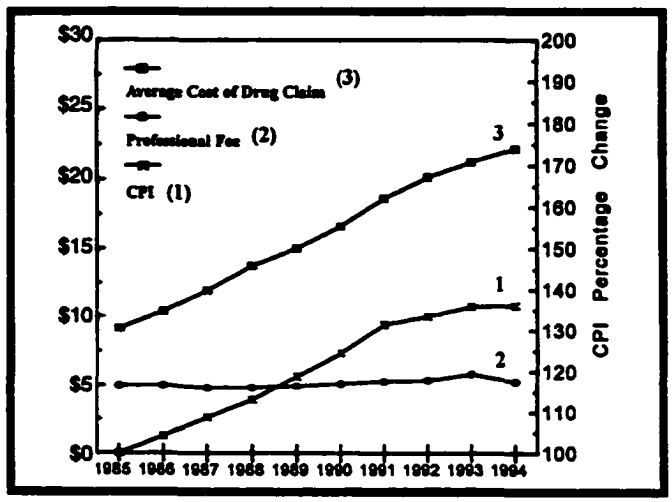
In each province, maximum fee levels are negotiated between the provincial government and the pharmacy association. The maximum bundled professional fees range from a low of $3.92 in Newfoundland to a high of $160.00 in New Brunswick ($160 applies only when drug actual acquisition is $6000 or more). The average maximum bundled fee is about $8.00. The maximum unbundled fee ranged from a low of $3.92 in Newfoundland to a high of $22.48 in Quebec. The most frequent amount for an unbundled fee approaches $15.00 (CPhA, 1997). Payments for professional services associated with non-prescription items and services (e.g., syringes, insulin, ostomy and diabetic supplies, and over the counter drugs) are recovered in the retail mark-up. Within public drug plans, maximum mark-ups for these items range from 10% to 76% (CPhA, 1997).

Some trend data on pharmacy professional fees in Canada is in Figure 2.1. The

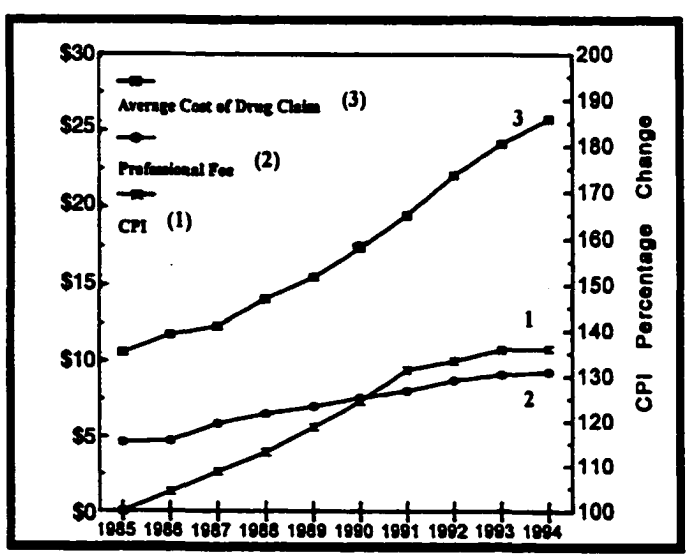
average cost of a prescription and pharmacy professional fees and the consumer price index were compared from 1985 to 1994. The data showed that, in public sector plans, professional fees have not changed since 1985 and have not kept pace with the consumer price index over the last five years. In private plans, although fees increased by 50% over the 10-year period, they did not keep pace with the CPI after 1991.

Figure 2.1 Trends for Pharmacy Professional Fees in Canada (1985-1994)

Public Sector Plans



Private Sector Plans



Source: Pharmacist as Key Partners in Drug Plan Management (p. 7) by National Pharmacy Coalition on Managed Care, 1995. Reprinted with permission.

A critical element of an unbundled fee-for-service model is a standardized

documentation and classification system for pharmacist professional activities. Significant work by the National Association of Retail Druggists (NARD) now known as the National Community Pharmacists' Association, and the National Council on Prescription Drug Programs (NCPDP) culminated in the development of a nationally accepted documentation and classification system in the United States (Portner, 1994; Rupp, 1995). Similarly, in 1997 the Canadian Pharmacists' Association established the Working Group on Pharmacy Reimbursement Methods to develop standards for the reimbursement of pharmacist services. The committee listed 14 essential services, defined by pharmacy regulations and standards of practice, that were considered part of the dispensing fee. Seven enhanced distribution services were identified that fall outside of the bundled fee. The committee identified five categories of patient care services and assigned billing and claim codes for them. Finally, a relative-value concept based on time and complexity factors was incorporated into the framework. The committee is reviewing the model with pharmacy practitioners and payers. A reimbursement methods working paper has been developed (CPhA, 1998).

Specific fee-for-service payment models have been developed using relative-value scales. Relative-value scales categorize services based on an integrated "value", composed of time factors, skills requirements, perceived value, and other factors. Preliminary work on a relative-value scale for pharmacy services examined three dimensions of pharmacist effort: time, cognition, and communication, and a number of prescription characteristics: drug class, method of payment, patient age, new versus refill status, and types of drug-related problems. Processing a prescription with a drug-related problem (e.g., drug interaction or excessive dosage) increased effort two-fold and

increased by 50% when a prescription was processed for a non-compliant patient (Poirier et al., 1997). The Wisconsin pharmaceutical care payment model is based on relative-value principles (Whitmore, 1997). Payments may be made for 46 specific reason codes in the categories: administrative, dosing/limits, drug conflict, disease management, and precautionary. The pharmacist selects one of 12 action codes and one of 22 result codes. The payment system is based on five levels of professional time claimed: 0-5 minutes, 6-15 minutes, 16-30 minutes, 31-60 minutes and over 60 minutes. The payment amount is determined through a formula which considers professional time (intervention, dispensing and documentation components) and an over-head allowance (professional and non-professional components). Payments range from $9.08 to $38.55. The Wisconsin program has not been evaluated up to this time.

In summary, existing fee-for-service payment models are quite refined for product costing but lack refinement in the area of pharmacist/or professional services fees. The emphasis continues to be on distributive services with only a limited focus on the cognitive services. There is a need to evaluate new or modified fee-for-service payment systems that place greater emphasis on pharmacists' cognitive services.

Capitation Reimbursement Models

Currently, capitation payment models for physician services are receiving attention because there is a belief that they align reimbursement incentives with the overall goals of the health care system: the promotion, protection, and restoration of population health (Birch, 1994). Greater interest in pharmacy capitation models is anticipated as more experience is accumulated with physician capitation systems.

Capitation is a payment model in which payment is made prospectively on a per patient basis irrespective of the products and/or services delivered. Patients are rostered (assigned) for a specified time period to a pharmacy provider. Service rationalization or minimization is a primary incentive of capitation (McDonald and Lopatka, 1997).

Capitation models for pharmacy services differ by the products and services included in the capitation fee. A comprehensive capitation system would include all drug and pharmacy service costs in the capitation fee. A variation of the comprehensive model is to earmark or dedicate a portion of the payment to drug ingredient costs and another portion to pharmacist services. Alternatively, only the pharmacy services may be capitated and the drug component would continue to be reimbursed in the usual manner.

Capitation reimbursement is based on the pharmacy assuming some financial risk for providing services to the defined client base. Clients may utilize more services than anticipated, compromising pharmacy profitability. Techniques exist to reduce financial risk, generally by making medication less available and establishing limitations for "catastrophic" use. Specific techniques to decrease provider risk include maintaining large roster sizes, grouping individuals into similar risk categories and adjusting the capitation rate based on risk, accurately assessing provider expenses and revenues, restricting the scope of products and services covered by the capitation fee, and introducing patient cost sharing.

In Canada, capitation reimbursement systems are most commonly used for the reimbursement of pharmacy services provided to long-term care facilities. Five provinces, British Columbia, Alberta, Manitoba, Ontario, and Nova Scotia, make use of capitation payments for long-term care facilities. Commonly pharmacies receive a

capitation fee for pharmacy services and a separate payment for drug ingredient costs. Monthly capitation fee rates vary across Canada from a low of $20 to a high of $55.67 per bed. There have not been any changes in these rates for over five years. Although no formal evaluation of these models has occurred, capitation reimbursement has been credited with controlling drug costs in long-term care facilities (McDonald and Lopatka, 1997).

Pharmacy capitation models are rare in ambulatory settings. Two provinces, British Columbia and Alberta, have introduced capitation reimbursement systems for methadone maintenance and withdrawal programs. In the British Columbia program, a capitation fee is used; methadone ingredient costs are billed separately. In Alberta, a comprehensive model is being evaluated. The payment rates are $105.00 monthly in British Columbia and $177 for 4 weeks in Alberta.

In the US, pharmacy capitation was tested extensively in the 1980's in the Iowa Medicaid program (detailed study results are discussed below). Capitation is common for pharmacy services in managed care organizations and for health maintenance organizations. Merck Medco Paid Prescriptions (a pharmacy benefit management company) uses capitation funding. In state drug plans, Tennessee introduced capitation for Medicaid recipients.

Salary Reimbursement Models

Up to this point, the discussion about pharmacy reimbursement systems has focussed on two approaches for paying pharmacies. Salary payment systems are important in the payment of pharmacists. Estimates are that at least 75 to 85% of

pharmacists practicing in the community are paid on a salary-only basis by the pharmacy employer (Lopatka, 1997). Pharmacists receive a fixed hourly wage scaled to their job rank. Recent Canadian pharmacist salary surveys indicate that full-time pharmacists' wages ranged from $22.60 to $29.80 per hour ($45,700 to $60,300 salary per annum; Pharmacy Post, 1997).

Hybrid salary arrangements are possible, where additional financial incentives are provided to achieve particular practice activities. There is limited information that these hybrid salary models are used for staff pharmacists. For example, in a performance-based salary system a pharmacist would be paid a salary and receive further payments based on performance (e.g., the quality and quantity of cognitive services provided). Additional financial rewards could be distributed on a team-based or personal-based incentive system (Flannery, Hofrichter and Platten, 1996).

Combination/Mixed Reimbursement Models

Combination reimbursement models for pharmacy services use mixtures of fee-for-service, capitation, and pharmacist salary systems. Adjusting the mix of these reimbursement systems can manipulate the pharmacy practice incentives. Currently most payment systems are combination systems; pharmacists are reimbursed by salary while pharmacies are predominantly reimbursed on a fee-for-service basis and, on occasion, by capitation. However, there is little direct linkage between the pharmacy reimbursement system and the employee salary.

Payers may select one or more payment mechanisms, depending on the type of service required. A single pharmacy could be reimbursed in the three different payment

methods. For example, reimbursement could be on a capitated basis for a diabetic client needing in-depth counselling services and assistance with blood glucose monitoring as disease management services. The pharmacy could receive funding towards the salary of a pharmacist position for conducting an academic detailing program to physicians. Also, the pharmacy would continue to be reimbursed on a fee-for-service basis for prescription products and services.

Responses to Financial Incentives

Physicians and Others

Computerized searches were conducted of MEDLINE and Healthstar databases for the years 1985 - 1997. The combined key words used were health personnel, physician, dentist, reimbursement mechanisms and incentives. Fifty-nine articles were identified in MEDLINE and 93 articles through Healthstar. Working papers published by Canadian health care policy research organizations (e.g. Center for Health Economics and Policy Analysis) were hand searched.

Published health sector literature primarily enumerates the hypothesized strengths and weaknesses of various payment models; however, the actual experimental evidence is limited. Moreover, the majority of the health sector research has been conducted with physician payment.

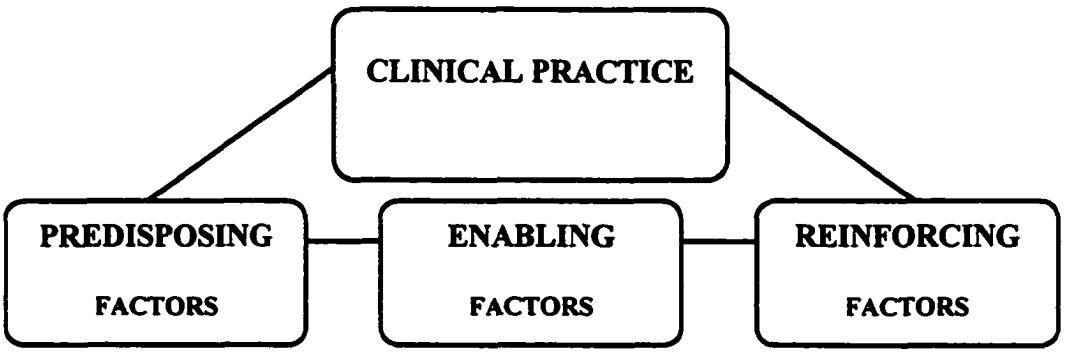
Glaser (1970) described the impact of various reimbursement systems on physician practice in an early work "Paying the Doctor". The conceptual framework for the work was based in political economics and sociology. Glaser described and analyzed methods of physician services reimbursement in various countries. Evidence was

summarized about the effects of each payment system on medical care and the medical profession. Fee-for-service systems encouraged services of marginal value while low-profit, high time-commitment procedures are discouraged. Medical specialties may become under-developed in this system as referrals are discouraged. Moreover, fee-for-service systems require regular consultations and review by medical associations and payers. Capitation reimbursement, with its inherent incentive to "do less", results in excessive patient referrals, provides no financial signals for more effort or for better quality work, reimburses a conservative patient care approach, and reinforces the distinction between general practitioners and specialists. Capitation is complex to administer.

Salary systems do not encourage marginal or multiple procedures, encourage close colleague relationships, stimulate interest in professional growth and economical care, but may encourage hasty care and excessive referrals and discourage home visits. There is no incentive for efficiency in the system. Relative to the other systems, salary systems are administratively simple.

Tamblyn and Battista (1993) used a behavioural theory model to review the research on the effectiveness of strategies to change physicians' clinical practice. Determinants of practice patterns and interventions to change practice were grouped into predisposing, enabling and reinforcing factors. Their model is summarized in Figure 2.2.

Figure 2.2 Determinants of Medical Practice Patterns and Related Interventions to Change Practice



Determinants

Clinical Competence	Sociodemographic Characteristics	Practice Setting	Patient Population	Reimbursement Policy

Interventions

knowledge skill	restrict/monitor practice	practice aids standards and feedback administrative policy	knowledge expectations	remuneration criteria/amount method

Adapted from Changing clinical practice: which interventions work? (p. 275) Journal of Continuing Education in Health Professions by Tamblyn and Battista, 1993.

The authors reviewed 150 articles. Reimbursement policy was classified as a reinforcing factor. Two characteristics of reimbursement policy, the criteria for payment and method of payment were effective in changing day-to-day physician performance and resource use. Evidence for the effect of amount of payment on practice patterns was weak. Physician acceptance and use of the reimbursement strategy, and change in patient outcomes from reimbursement policy interventions, remains untested.

A review of general practitioner remuneration in five countries was conducted by contacting key informants in each country and reviewing fee guides and manuals

(Kristiansen and Mooney, 1993). The results indicated that payment models could influence clinical practice. In addition, the authors concluded that information about the impact of payment models on practice is limited, that a period of experimentation should precede wholesale changes, and that policy makers must be clearer about their wants from physicians.

The Medical Outcomes Study (MOS) was a comprehensive study designed to determine how specific components of the health care system affect outcomes of care (Tarlov et al., 1989). Relationships among major structural, process and outcome variables were examined. Financial incentives were included as structural variable in the model. The MOS study spanned two years, 1986-1988, and was conducted in three US cities. Patient and clinician data was obtained through written and verbal surveys. Health status measurements were obtained from MOS patient assessment questionnaires. Two payment variables were considered in structure of care: system financial incentives and provider economic incentives. Five systems of care were identified to examine the impact of financial incentives: (1) prepaid group practice health maintenance organization; (2) large multispecialty group practice – prepaid; (3) large multispecialty group practice – fee-for-service; (4) solo or small single – specialty group practice – prepaid; and (5) solo or small single – specialty group practice – fee-for-service. In one report (Greenfield et al., 1992), the physician specialty and system of care were examined independently to determine if they affected resource utilization. The results indicated that resource use, including prescription drugs, was independently related to specialty training, practice organization, and payment systems. Prescription drug use was highest in solo fee-for-service and lowest in prepaid specialty groups. Safran, Tarlov and Rogers (1994)

examined differences in the quality of care delivered in prepaid and fee-for-service systems. Quality of primary care varied in the three payment systems: fee-for-service, independent practice associations (IPA), and health maintenance organizations (HMOs). Quality factors such as continuity and accountability were highest in fee-for-service, while access and coordination were highest in HMOs. Ware, Bayliss, Rogers, Kosinski and Tarlov (1996) found that both elderly and poor patients had worse physical outcomes in HMOs compared to fee-for-service systems. Overall, the MOS study confirmed that patient outcomes were affected by physician payment systems and financial incentives. The results showed important differences in utilization of resources and the quality of care within each of the payment systems.

A recent Canadian study by Birch, Goldsmith, and Makela (1994) included a review of evidence of physicians' responses to financial incentives. The main objective of the work was to analyze the applicability of alternative payment and delivery systems to the current Canadian health-care environment. The authors proposed a blend of capitation fees to financially reward the level of physician responsibility; one that rewards patient need and the other for the use of resources. The authors recommended that change in the reimbursement structure should be evolutionary rather than revolutionary.

Research on alternative reimbursement for other health care providers is not as common as for physicians. In dentistry, a major study of capitation reimbursement compared the cost effectiveness, feasibility, suitability and acceptability of dentistry fee-for-service and capitation reimbursement systems (Holloway, Lennon, Mellor; 1990a, b, c). The study spanned three years and involved 354 practices in the United Kingdom. Data were collected using independent dentist examinations of patients, and dentist

questionnaires and interviews. The main findings showed no difference between the two payment models in the dental health of children, or in dentists' or parents' satisfaction levels. Capitation was considered administratively feasible. Dentists reimbursed with capitation reported more clinical freedom and initiated more preventative dental activities. Dentists receiving capitation reimbursement saw their patients less frequently and performed fewer fillings, extractions and x-rays while maintaining an acceptable level of quality.

Yates, Yokley and Thomas (1994) compared the benefits and costs of six different payment systems for child and adolescent therapists in a mid-western US community mental health centre. Over a five-year period, 23 full-time therapists voluntarily participated in incentive plans. Different amounts and types of bonuses were paid for increased productivity. Net benefits were determined and comparisons made between payment approaches. The results indicated that dual focussed financial incentive systems, with individual and group incentives for both the individual therapist and supporting staff, proved to be the most cost-beneficial.

In summary, physician research shows that payment systems affect medical care. Physician reimbursement policies are a reinforcing factor in clinical practice. Criteria for payment and method of payment appear to have a greater impact compared to amount of payment. Financial incentives affect resource use, quality of care and outcomes. Studies indicate there is a need for more research on the impact of financial incentives on physician behaviour. Similarly, other health care providers such as dentists and therapists have been shown to respond to financial incentives provided by reimbursement systems. It is not clear, however, that these reimbursement incentives can be transferred to

pharmacy practice.

There are distinct characteristics of payment models used in community pharmacy compared to other health care providers. First, pharmacy payments are made for a product and service. The structure of the payment model for one component can have a major impact on the other. Second, most pharmacists are salaried employees. The service providers are not reimbursed directly for services provided, insulating providers from the financial impact of their decisions and practice patterns. Finally, most health profession reimbursement studies were conducted on physicians and dentists, both professions with a great deal of control over resource utilization. Pharmacists, being downstream from prescribers in the drug distribution system, have less control over resource utilization.

Pharmacy

Computerized searches were conducted of MEDLINE, Healthstar, EMBASE, International Pharmacy Abstracts and Econolit databases for the years 1970-1997. Key words used in the 1970-1997 search were pharmacist, pharmacy, reimbursement mechanisms and incentives, pharmaceutical economics, financial management, fees and charges, fee-for-service, capitation fee, pharmaceutical fees, prescription fees, dispensing fees, professional service fee, cognitive service fee, economic model and system, payment model and system, reimbursement model and system, community pharmacy services, pharmaceutical service, and pharmaco economics. Key journals were hand-searched, bibliographies in articles checked, and key experts contacted in the field of pharmacy reimbursement. There has been significant discussion of payment models for pharmacy

services; indeed, over 3,000 citations were identified in the 1970-1997 search. Most articles discuss potential advantages and disadvantages of reimbursement systems or offer anecdotal experiences (Ishii, 1994; Meade, 1994; Poston, Cooper, Bruce and Parn, 1994; Braden, 1995). The search was updated for 1998-1999. The combination of key words used in the updated search were pharmacy, pharmacists, reimbursement mechanisms and incentives, fee-for-service, capitation, and salaries. Key journals from 1999 were hand searched. Only 19 articles were found that report empirical research assessing the impact of pharmacy remuneration systems on pharmacist practice and drug utilization outcomes. Major research projects and program analyses are discussed below.

Iowa State Capitation

Two studies of capitation reimbursement for community pharmacy services were conducted in the Iowa state Medicaid program. The first, a pilot study, was conducted in two rural counties from 1975 to 1978. The second was done in 32 counties, both urban and rural, covering a nine-month period (April to December 1981).

The Iowa capitation pilot used a before/after, experimental-control design to evaluate the effects of a pharmacy capitation model on drug utilization, drug costs, quality of pharmacist care, and on Medicaid administrative costs. Pharmacies received a prepaid monthly fee for all pharmaceutical products and services supplied to rostered Medicaid recipients, adjusted for patient type, inflation, and season of year. The capitation rate was set at 90% of the projected fee-for-service drug and pharmacy service cost. The remaining 10% was withheld to cover cost over-runs; unused funds were distributed equally between pharmacies and the Medicaid program. Data were collected

for one year prior and two years post-implementation of capitation reimbursement. The effects of capitation reimbursement and dispensing behaviour were assessed by measuring the quantities of drugs dispensed, the dosage regimen, the types of drugs dispensed within a therapeutic category, the use of non-prescription drugs, and the rate of drug interactions (Helling et al., 1981; Norwood et al., 1981). In addition, the "spillover" effects of capitation on generic substitution rates for non-Medicaid prescriptions was assessed using an interrupted time-series design on prescriptions (n=61,585) from two experimental and control counties (Lipson, Yesalis, Kohout and Norwood, 1981). Pharmacists' perceptions of the project were collected through structured interviews (Cirn, 1980).

The key findings were:

(a) capitation produced a 16% savings in drug-ingredient costs;

(b) capitation produced a six-fold increase in the incidence of generic substitution in the capitation reimbursement group;

(c) the savings per prescription when generic substitution occurred were twice as large in the capitation group as the fee-for-service group;

(d) patients in intermediate care facilities consumed one less prescription per month in the capitation group, and the quantity per prescription for maintenance drugs increased 20%;

(e) capitation produced a six-fold increase in the rate of substituting non-prescription drugs for more expensive prescription products in the capitation group that, on average, incurred a savings of $5 per substitution;

(f) the appropriateness of pharmacist dispensing behaviour and its resultant effect on multiple indicators of drug therapy quality either remained the same or improved under

capitation compared with the fee-for-service system; and

(g) as a result of introducing capitation reimbursement for Medicaid beneficiaries, pharmacists increased generic drug product selection four-fold for non-Medicaid prescriptions.

An expanded capitation study was launched in 1981, encompassing 32 test and control counties and metropolitan areas (Yesalis et al., 1984 a, b). Again, a comprehensive capitation model was tested. Of the extrapolated fee-for-service cost to Medicaid, 80% was paid out as capitation fees and the remaining 20% was held in an escrow account to cover cost over-runs, emergency dispensing, and bonus payments. Drug utilization data was collected for nine-month periods before and after the introduction of capitation reimbursement. Counties were stratified into three groups on the basis of population and matched according to Medicaid drug expenditures. Prescription audits were done using an interrupted time-series design to assess changes in the quality of drug therapy and in pharmacist dispensing behaviour. Approximately 300,000 Medicaid and non-Medicaid prescriptions were audited.

In marked contrast to the pilot study, the results of the expanded study were: (a) no significant increase in generic substitution; (b) no significant changes in the rates of quantity, therapeutic or non-prescription switches; (c) no change in average days supply of maintenance drugs; (d) no differences in the appropriateness of dosages used; (e) differences in costs in only three therapeutic categories; (f) no significant differences in the incidence of drug interactions; and (g) no significant difference in the number of prescriptions used (Yesalis et al.; 1984a, b). Moreover, despite a 3% reduction in drug costs in the capitation group, overall program costs were 9% higher. Indeed, the

expanded study was terminated after nine months because of significant lobbying against the capitation program by both pharmacy organizations and the pharmaceutical industry.

A more detailed analysis of the expanded study results revealed different responses to capitation incentives in rural and urban centres. Urban counties incurred a 10% savings in drug ingredient costs under capitation. These positive results were most pronounced in those pharmacies with a large number of clients eligible for the study. The authors concluded that the capitation system functioned adequately in some urban areas (Stuart and Yesalis, 1990).

Several factors were identified to explain the differences in the findings between the pilot and the expanded study. Only two were related to the design of the research and the reimbursement model: a lack of pharmacist education and a questionable rationale for the rate setting (payment amount). The remaining factors were environmental and external to the design: pharmacist attitudes and expectations, and a relationship of mistrust and antagonism between pharmacists and Medicaid. Yesalis and Levitz (1985) suggested the difference in results between the pilot and expanded capitation studies were likely due to a major change in environmental factors. Several groups, including some pharmacy organizations, pharmacy owner association, and some pharmaceutical companies, lobbied against the capitation system and encouraged pharmacists to resist responding to the financial incentives of capitation reimbursement. The outcome of this project demonstrates very clearly the need for closer alignment of payer and provider communications when new reimbursement systems are being considered.

Washington State CARE Project

The Washington CARE project used a prospective, randomized control study design to evaluate the impact of fee-for-service payments on pharmacists' documentation of cognitive service interventions in the Washington State Medicaid program (Christensen and Holmes, 1996; Christensen et al., 1999; Christensen and Hansen, 1999; Smith, Fassett and Christensen, 1999). The primary goal of the study was to determine whether direct reimbursement for cognitive services produces an increase in the number of cognitive services by pharmacists. Pharmacist documentation/claim forms were used as a proxy measurement for services provided.

Pharmacies were randomly assigned to test (receive financial incentive) or control (do not receive financial incentive) groups. A total of 200 pharmacies were enrolled in the study. A cluster allocation technique was used to minimize "prescriber influence" by pharmacists. It was assumed that physician prescribing would be influenced over time and the need for subsequent pharmacist interventions would be reduced. Clusters of pharmacies linked to prescribers were used as the sampling unit. Pharmacies in the control group documented cognitive services, received a small participation fee, but were not eligible for a cognitive service fee. Pharmacies in the test group documented cognitive services, received a small participation fee and were eligible to bill for cognitive services. There was no attempt made to observe pharmacists performing cognitive services. Reimbursement rates were $4 or $6 depending on the time taken for the cognitive service. An external silent control group was also used. A total of 20,240 cognitive services were documented over 18 months (February 1994 to September 1995). Extensive data analysis evaluated differences in the frequency and characteristics of the

cognitive service documentation between control and test groups. The major findings were as follows. The mean cognitive service documentation rate was 1.59 per 100 prescriptions in the test pharmacies and 0.67 per 100 in the control pharmacies. The difference was statistically significant. There were significant differences in the characteristics of documented cognitive services between payment groups. The major differences were seen in the test group preferences for selected cognitive services: patient case managed and drug complex administration (as problems), patient training (intervention), and dispense as written and counsel patient (as results).

Two mail surveys were administered to collect pharmacy and pharmacist information. The pharmacy questionnaire was completed by the pharmacy manager. Data were tabulated by pharmacy location, size, volume, drug utilization review (DUR) computer applications, and internal policies on drug therapy interventions. The pharmacist questionnaire collected information about training, workload, DUR and cognitive service intervention experience, and attitudes and beliefs about professional practice issues. The total number of useable questionnaires was 203/298 pharmacy manager and 384/651 pharmacist questionnaires. The data from the two surveys were linked to cognitive service documentation to explore multivariate relationships.

The major findings were as follows. The documentation of cognitive services correlated with higher numbers of pharmacists employed and owner-manager awareness of documentation procedures. The number of documented cognitive services was also associated with payment group, lower overall prescription volume and a higher percentage of Medicaid prescriptions. The pharmacist characteristics associated with documentation were: being an owner-manager, perceiving documentation to be less

burdensome and working in a pharmacy with lower total prescription sales. Levels of pharmacist documentation were: associated with a higher percentage of Medicaid prescriptions, lower monthly prescription volumes and pharmacists working in medical centres. Pharmacy related factors (work environment) were found to be stronger predictors of cognitive services than pharmacist factors.

An economic evaluation was conducted to determine the impact of cognitive service payments on drug therapy costs. Drug cost changes in each group were determined by comparing the actual cost of drugs used to the cost of drugs which would have been incurred in the absence of the pharmacy cognitive service. Actual costs were estimated from the Medicaid database. Estimated costs, in the absence of the cognitive services, were based on the original prescription written. Changes in costs were determined for a one-year period including both the immediate prescription dispensed and subsequent refills (refusals to dispense and drug discontinuations were not counted). Only prescriptions with drug therapy changes were examined in the evaluation. In the sample ($n = 2002$) mean cost savings per claim for test group was $11.45 and $15.33 for the control group. The payment program did not appear to be cost-effective as the control group saved more than the test group.

In summary, the Washington study demonstrates that financial incentives increase the frequency of documentation of cognitive services. The study was a well designed experiment. Payment for cognitive services did not yield greater drug plan savings when the fee payment was taken into account. Pharmacy environmental factors such as the higher numbers of professional staff, lower prescription workloads and a high proportion of Medicaid prescriptions were predictive of increased cognitive service activity.

Arkansas

In the state of Arkansas, a prospective randomized control study was used to determine if payment would affect pharmacists' documentation of cognitive interventions over and above those required by legislation (McCormack et al., 1996). Thirty Arkansas community pharmacies were randomly selected and assigned to one of three payment groups: an experimental group, paid $4 or $6 to document interventions; a second group, paid a $100 participation allowance; and a control group receiving no payment. Interventions were self-reported by pharmacists. A panel of three clinical pharmacists classified interventions according to the morbidity potential. For moderate risk interventions, cost savings from anticipated avoided physician visits were estimated; for high-risk interventions, cost savings from anticipated avoided emergency room visits were estimated. Three hundred and fifty useable intervention reports were collected over one month. Pharmacies receiving the fee-for-service reimbursement documented 137 interventions (39.1% of the total interventions) interventions, while pharmacies receiving the participation fee documented 140 (40%) and the control group documented 73 (20.9%). Claim rates were not calculated as prescription volumes were not reported. There was a significant difference in the numbers of interventions between the control group and the groups paid either the fee-for-service fee or the participation allowance. It would appear that a cognitive service fee and the participation allowance both increased documentation of cognitive services. No information was presented on the effects of the program on drug utilization. The total cost avoidance was estimated at $12,880 or $6.13 for every dollar paid to the pharmacist. Only a brief summary article about the Arkansas study was available for review.

Quebec Pharmaceutical Opinion Program

The Quebec pharmaceutical opinion program, previously described, has been subject to a number of evaluations. In response to low opinion submission rates, Quebec pharmacists were surveyed to identify obstacles for pharmacists completing and claiming pharmaceutical opinions (Dumas, 1994). An anonymous mail-in questionnaire was sent in 1985 to a random sample of community pharmacists from the Quebec Order of Pharmacists. Nearly 75% of the questionnaires (477/558) were returned. Over 75% of the respondents identified "too much paperwork" and "lack of time" as important obstacles for their use of the opinion program. The obstacle "too much paperwork" was further explained by pharmacists to be related to the criteria required for opinions, the lack of clarity of terms and definitions in the pharmacy agreement, and the requirement that complete text of the opinion be submitted. "Lack of time" was identified as important because pharmacists considered the opinion to be of lower priority than dispensing, took too long to write, and got in the way of tasks considered more important. The rating for lack of time as an obstacle was related to the number of prescriptions dispensed per day. Other obstacles which were rated "important" by 50% or more of the respondents were lack of example opinions, inadequate compensation, and lack of a professional relationship with the prescribing physician.

A second report (Dumas and Matte, 1992, 1994) outlined the characteristics of pharmaceutical opinions produced and assessed and the extent to which pharmacists' recommendations were accepted by physicians and/or patients. Opinions from one rural community pharmacy (n=566) over five years (1978 to 1983) were coded using a classification system based on type of drug-related problem and recommendations made.

Pharmacy patient profiles were reviewed to determine whether opinions had an impact on patient drug therapy. Results revealed that pharmacists initiated 97.9% of opinions, the mean patient age was 67.4 years, the most frequent patient recommendation was compliance, and the most frequent physician recommendation was to replace one drug with another. Acceptance of opinions were 77.7% for patient recommendations and 58.1% for physician recommendations. The impact of recommendations could not be measured in about one-fifth of cases. The study was limited as it included only a single community pharmacy.

Poirier and Gariepy (1996) reviewed the Quebec program over a 15-year period, 1978 to 1993. Over that period, claims for the two primary codes, pharmaceutical opinions and refusal to dispense, increased from 100-200 to over 23,000 annually. The results of the two major refinements to the pharmaceutical opinion program were examined (1983 and 1992 changes). It would appear that pharmaceutical opinions increased by at least 50 fold while refusals to dispense increased 150 fold over the 15-year period. There were not any significant changes in the level of reimbursement over this period. Considering that more than 35 million prescriptions are dispensed annually in the province, the claim rate remains very low. Gariepy (1997) indicated that in the fiscal year 1994-95, 69% of pharmacies participated by billing at least one cognitive service.

Despite being the longest running cognitive service payment model, very little is known about the effects of the Quebec reimbursement model on pharmacy practice, drug utilization or health outcomes. Only a limited amount of descriptive research has been conducted on the program. The studies on the Quebec program were observational and

not experimental in design.

British Columbia Pharmacare

Grootendorst, Goldsmith, Hurley, O'Brien and Dolovich (1996) examined two pharmacy reimbursement policies intended to encourage the dispensing of lower cost or generic drugs in BC. The BC Pharmacare program first introduced the Product Incentive Plan (PIP), and then replaced it with the Low Cost Alternative (LCA) program. A case study approach was used in this evaluation. Pharmacare expenditure data from 1988 to 1994 formed the basis of estimates for rates of generic substitution. In addition, the Canadian Index and Canadian News Index was searched from 1990 to 1995 for media reports, and unpublished documents were obtained from Pharmacare and the British Columbia Pharmacy Association. Also, semi-structured interviews were conducted with BC Pharmacare senior policy makers, BC College of Pharmacists and BC Pharmacy Association representatives, as well as individual pharmacists and a physician. Stakeholders reviewed the final draft of the case report for correctness, completeness and accuracy. Major findings were reported as follows.

The PIP was introduced as an income transfer to pharmacies, and to control Pharmacare expenditures with no reduction in coverage for beneficiaries. From both the business and professional perspectives, pharmacy stakeholders supported PIP. Pharmacists felt PIP was a first step to addressing revenue concerns facing pharmacy. Pharmacare allocated a startup budget of $5 million for the program. Pharmacists believed that pharmacy was being recognized as an important health care professional partner. Both government and pharmacy saw PIP as a partnership opportunity to achieve

mutual goals (win-win). Under PIP pharmacists could exercise their professional discretion in generic substitution without financial penalty. Pharmacists who dispensed an equivalent generic drug in place of a more expensive brand name product were paid a bonus equal to 20% of the difference between a base price and the actual price. PIP signaled to pharmacists a first step to implementing payment for cognitive services. PIP produced an increased use of generic drugs, lower than anticipated effect on pharmacy incomes, and a financial situation where incentive payments to pharmacists exceeded drug product cost savings. The savings generated from PIP were not sufficient to meet the government's expectations.

Pharmacare managers replaced PIP with the LCA program to boost the rate of generic use. With the LCA program, pharmacies faced financial loss if a generic drug was not dispensed. Pharmacists perceived the LCA program as a non-cooperative arrangement between government and pharmacy. The pharmacy perceptions and responses were explained from both a professional and business perspective. Pharmacies lost considerable income in the change from PIP to LCA. They also lost the ability to use professional discretion. Pharmacists interpreted the government's message to mean than pharmacists' skills were not valued by government. The pharmacy response was to protest the LCA program through public relations campaigns, sabotage of other joint initiatives, and even threats of litigation. In response, the Pharmacare program increased maximum dispensing fees, delayed the implementation of the LCA program, and created a multi-stakeholder committee to review the LCA program. Overall, the LCA program was very successful in reducing expenditures through increased use of generic drugs, but at the cost of disenfranchising pharmacists and pharmacy organizations.

The case study showed that the form of a financial signal has a dramatic effect on the behaviour of pharmacy stakeholders. The penalty-based LCA policy led to greater behavioural change compared to the bonus-based PIP. The LCA policy produced large savings, did not affect quality of care and was easy to administer. The policy came at the cost of disenfranchising pharmacy stakeholders.

Trial Prescription Programs

Trial prescriptions were briefly discussed earlier. The process of two-part dispensing has potential ramifications on both drug wastage and patient care. Medication wastage due to patient intolerance and discontinuation of therapy is reduced; in addition, trial prescriptions encourage pharmacists to monitor newly initiated drug therapies more closely.

Sullivan (1996) evaluated a 6 month pilot study for an Alberta trial prescription program. Pharmacists' manual documentation and prescription claims data were used to obtain descriptive information, estimate trial rates and calculate the cost impact of the program. A combination of pharmacist interviews, surveys and focus groups were used to assess pharmacist opinions and perceptions about the program. Pharmacies received a prescription fee for dispensing a trial medication, equivalent to one dispensing fee, and a further fee each time the balance quantity was dispensed. Four therapeutic drug groups were eligible for the pilot study: angiotensin converting enzyme inhibitors, calcium channel blockers, non-steroidal anti-inflammatory agents, and histamine blockers. Only beneficiaries of the government-sponsored seniors drug program were eligible for the trial prescription pilot. Twenty out of 36 pharmacy sites performed a total of 82 prescription

trials during the six-month pilot. Approximately 13% of the prescription trials were not completed resulting in drug cost savings of $469. Pharmacy fee payments exceeded drug cost savings by $234. The pharmacist survey revealed that a lack of time to conduct prescription trials contributed to a low number of prescription trials.

The General Motors pharmacy intervention study evaluated the cost impact of six pharmacy protocols on a large Ontario employer's drug plan costs (Smith, 1997). Pharmacies were paid to perform trial prescriptions with follow-up calls to patients to determine if more medication was required. Data were collected for six months. Drug costs were held constant compared to costs in similar employer drug plans where costs increased by 10%. Only a small part of the decreases (1-2%) could be attributed to the protocols: trial prescriptions, quantity control for maintenance and non-maintenance medications and ensuring therapeutic appropriateness. Most of the savings (98-99%) were attributed to other "qualitative" interventions. Trial prescriptions accounted for only 1% of the savings. The full report was not available to examine the research design, methodology and results.

Results from the Managed Medication Use Program for Metro Toronto were recently made available (Ontario Pharmacists' Association, 1998). Three pharmacy programs; a trial prescription program, health awareness course, and a maintenance drug system were provided for the municipality of metropolitan Toronto employees. The metropolitan Toronto Pharmacists' Association guaranteed the programs would generate annual savings of $200,000. Cardiovascular, gastrointestinal and non-steroidal anti-inflammatory drugs were included in the trial program. Pharmacists were paid a second dispensing fee only if the remainder of the prescription was dispensed. No fee was paid

when the prescription trial was not completed. A total of 3,095 prescription trials were initiated resulting in savings of $150,095. Savings were projected based on the quantity of drugs saved from trials that were not completed. The savings were determined as a net of the additional dispensing fees paid. The research design did not include a control group for comparison. Compared to other trial programs, a very high number of trials (1.6% of all prescriptions) were initiated.

Bradley (1998) reviewed the Saskatchewan trial prescription program after the first year of operation. In the program, pharmacies were reimbursed an additional reimbursement fee ($7.50) after the follow-up and documentation of the prescription trial was complete whether the balance quantity was collected or not. The Saskatchewan trial prescription plan includes the drug groups: antilipidemics, calcium channel blockers, non-steroidal anti-inflammatory drugs, alpha-blockers, antidepressants and two individual drugs (misoprostol and pentoxifyline). Drug plan statistical reports were reviewed and analyzed to evaluate drug utilization and cost. A survey of community pharmacists was conducted to identify barriers, gather opinions and attitudes related to the trial program. A total of 2,619 prescription trials were performed; 1,140 balance quantities were not collected. Drug cost savings were calculated to be $38,600 while additional pharmacy fees were $15,000. A response rate of over 30% (246/789) was achieved for the pharmacist surveys. Pharmacists identified physician prescribing practices and drug samples as the largest barriers for trial prescriptions. Pharmacists supported the program's potential to save money through minimizing of drug waste. Analysis showed that pharmacy / pharmacists factors (full-time employment and a large pharmacy setting) correlated with a high number of prescription trials performed.

The quality of research design for the trial prescription studies was weak as none of the studies made comparisons between a control and intervention group or measured changes over time. The validity of the findings is questionable.

Related Pharmacy Research

In a cross sectional study, Raisch (1992) assessed whether community pharmacist counselling activities were related to payment methods and practice settings. The study included a random stratified sample of 595 community pharmacists in New Mexico. Reports were collected from pharmacists on counselling activities. Pharmacy students were employed to observe pharmacists performing counselling. The major findings were that patient counselling activities were significantly higher for fee-for-service self-pay and Medicaid patients compared to capitation patients. There was no difference in pharmacist-initiated counselling activities when chain and independent pharmacies were compared. Chain pharmacists outperformed independents in patient-initiated counselling activities.

Raisch (1993) conducted a second cross sectional study to examine community pharmacists' interactions with prescribers and to determine whether the interactions were related to the type of payment. Reports were obtained from a randomly selected stratified sample of 73 out of 205 pharmacists in New Mexico. Data collection occurred over a 40-hour period during shift times when the greatest number of patient interactions were likely to occur. The major findings were that prescriber interaction rates were higher for self-pay prescriptions compared to capitation or third party prescriptions. Pharmacists initiated 63.2% of the 730 interactions. The most common problems discussed (80.6% of

total) were dosage and drug name clarification. Both studies are weak in design as they lack a control group and use self-reported data.

Pharmacy Summary

Overall, there is limited evidence about the effects of pharmacy financial incentives on pharmacy practice and drug utilization. There are only a small number of studies, the areas of evaluation are limited, and the findings are inconsistent or incompletely reported. Results from experimental projects show that financial incentives have some effect on pharmacy practice. Capitation incentives increased generic and nonprescription drug substitution in one study; however, this effect could not be replicated in a second study. Fee-for-service incentives increased the frequency of documenting cognitive services; it is not clear, however, if the actual frequency of providing cognitive services is affected as well. Additional cognitive service payments have not been shown to significantly reduce drug costs and utilization when compared to no additional payment. No research was found on the effectiveness of incentive systems directly targeted to the pharmacist (e.g., salary). In general, the effect of pharmacy financial incentives on health care outcomes has not been established. There is limited evidence supporting the use of pharmacy financial incentive programs on a continuing basis. With the exception of the Quebec program, drug benefit programs paying for pharmacists' cognitive services are a recent development and not widely used. The amount of evaluative research is limited and the quality of the research that exists is poor in both design and methodology. The effectiveness of long standing financial incentives such as pharmaceutical opinions and refusal to dispense programs has not been

established. There is some data suggesting that incentives for trial prescriptions may have an effect on drug utilization and costs.

Overall, there is a need for more methodologically sound evaluative research on pharmacy payment systems. The extent of pharmacy research combining both quantitative and qualitative approaches is limited.

Chapter Summary

The desire to expand the pharmacist's role in the health care system and the implementation of the pharmaceutical care model have intensified the need for new payment models. Research shows that community pharmacists can influence prescribing and patient compliance through an expanded role. Survey research confirms that pharmacists consider reimbursement as an obstacle to providing enhanced services.

Currently, fee-for-service models dominate pharmacy payment systems while pharmacist payment systems are predominantly salary-based. There is limited development of fee-for-service or salary payment systems for cognitive services.

Physician payment systems research suggests that reimbursement is a reinforcing factor in clinical practice behaviour, and that criteria for payment and method of payment are important. Physician payment affects professional practice and in some situations outcomes.

There is limited research on the effects of payment for cognitive services in pharmacy. The research that exists indicates that cognitive service fees have an effect on pharmacy practice. Fee-for-service payment models increase the frequency of the documentation of cognitive services; however, there is no evidence to show an increase in

the actual frequency of services performed. Evidence does not exist about the effect of pharmacy incentives on intermediate outcomes (compliance or prescribing appropriateness) or on indicators (physician visits, hospitalizations). There is a need for pharmacy evaluative research on financial incentives in general and on incentives directed to the pharmacist.

CHAPTER III

METHODOLOGY

The purpose of the research was to examine whether pharmacist cognitive services, drug utilization and costs were affected by new reimbursement models. Pharmacists' perceptions about the reimbursement model were examined, and how the pharmacy reimbursement model worked within the context of a communication model. Three research designs were employed: an experiment measuring pharmacist practice, drug utilization indicators and cost savings; a pharmacist survey assessing perceptions of obstacles, impact and understanding of the payment model; and a case study to interpret the results from the perspective of general health care communication model.

Ethical approval was obtained from the University of Alberta Faculty of Pharmacy and Pharmaceutical Sciences ethics review committee. A copy of the approval is included in Appendix A.

The project was given the acronym PIER for Pharmacy Incentives and Evaluation of Reimbursement.

Experiment

The hypotheses addressed in the experiment were as follows.

Hypothesis 1 – There will be no difference between control and test groups (receiving payment for cognitive services); (a) in the frequency of cognitive services provided, and (b) in the mix of cognitive services provided.

Hypothesis 2 – For the cognitive services provided, there will be no difference between

control and test groups; (a) in the number of drugs ordered compared to the number dispensed, and (b) in the mix of drugs ordered compared to the mix dispensed.

Hypothesis 3 – For the cognitive services provided, there will be no difference between control and test groups in the cost (drug cost savings minus cognitive service payments).

Research Design and Experimental Intervention

A prospective, randomized control study design was used to evaluate the effect of a cognitive service fee system on pharmacist provision of cognitive services. Volunteer pharmacies were randomly assigned to either a control group or one of the two payment groups.

The experimental intervention was a fee-for-service payment for value-added cognitive services. The additional payment levels were $8.50 or $17.00. Appendix J summarizes the process used to determine the payment model and amounts. All pharmacies were requested to document cognitive services and submit documentation to the study coordinator. Control Group A pharmacies received no additional payment. Test Group B pharmacies received the fee paid directly to the pharmacy, while test Group C pharmacies received the same fee as test Group B, but the fee was split equally between the pharmacy and the pharmacist providing the service. Table 3.1 illustrates the reimbursement intervention employed.

Table 3.1 PIER Project Reimbursement Intervention

Group	Reimbursement Intervention
Control Group A	- no additional service fee paid
Test Group B	- payment to pharmacy of a $8.50 or $17.00 cognitive service fee
Test Group C	- 50/50 payment to pharmacy and pharmacist of a $8.50 or $17.00 cognitive service fee

Classifying the cognitive service was a prerequisite for billing. The components of the classification system for cognitive services are described later in this chapter and the detailed cognitive service definitions are shown in Appendix F. Value-added services were defined in the project manual and in the materials provided in the pharmacist orientation sessions. The cognitive services fee schedule is described in greater detail in Chapter IV under the subheading "PIER financial signal" and in Appendix K.

The Setting - Alberta School Employee Benefits Plan

The Alberta School Employee Benefits Plan (ASEBP) is a private benefit plan co-sponsored by the Alberta School Boards' Association and the Alberta Teachers' Association. Most Alberta school boards (141/146) are included in the plan. In 1994/95 approximately 30,000 employees and an additional 50,000 spouses and dependents receive benefit coverage from ASEBP.

On January 1, 1995 some changes to pharmacy benefits in ASEBP were introduced. In Plan 1, payment is provided for prescription drugs except where a lower cost alternative is available. The pharmacy dispensing fee is covered up to a maximum of $8.50. For non-prescription drugs, only retail cost is covered by the plan. In Plan 2, the same drug benefits are provided, but the dispensing fee is reimbursed to a maximum of

$5.50. Most pharmacies collect $3.00 from the patient with plan 2 coverage to offset the lower level of the dispensing fee paid.

In 1993, ASEBP pharmacy benefits amounted to $11.2 million, representing 84% of the $13.4 million total extended health care claims. Expenditures increased 16% over 1992 levels due to increased utilization; average prescription prices were stable over the two-year period.

The number of prescription claims and prescription expenditures were dominated by two therapeutic classes: anti-infectives and central nervous system agents. Utilization increased predominantly in the selective serotonin reuptake inhibitor antidepressant class of drugs. Overall, three drugs showed marked increases in utilization between 1992 and 1993: Prozac® (>45%), Losec® (100%), and Imitrex® (>150%).

Sample Size Calculation[2]

Sample size calculations were performed for the initial data analysis to determine the number of cognitive service interventions required for the experiment. Due to a change in the data analysis plan, it was necessary to compare the proportion of prescriptions with and without interventions. A post hoc sample size calculation has been presented for this change.

In the initial data analysis plan, the unit of analysis was cognitive service interventions. The mean number of interventions was to be compared between payment groups. The following assumptions were made for the sample size determination: t-tests

[2] The sample size determination shown is a post hoc calculation. Initial sample size was determined through an incorrectly applied formula. Because of the low level of documentation, chi-square tests were used instead of t-tests.

would be used for independent samples of equal size, a two-tailed test would be used, based on a conventional value for power of 0.8 and a level of significance of 0.05 were selected. Sample size values were obtained using sample tables from Cohen (1988, p. 55). The sample size value for a small effect size (0.2) was 393 interventions per group or for a medium effect size (0.5) 64 interventions per group. For the small effect size (0.2) it was calculated that a total of 786 interventions were required for the comparison of two payment groups (2 X 393) or 1,179 interventions for three payment groups (3 X 393).

In the revised data analysis plan, the proportion of prescriptions dispensed with and without cognitive service claims were compared among payment groups. The assumptions used for the calculation were: the use of a chi-square test for independent samples, a conventional value for power of 0.8, a level of significance of 0.05 and 2 degrees of freedom. The values were obtained from the tables in Cohen (1988, p. 258). The sample size value for a small effect size (0.1) was 964 cases and for a medium effect size (0.3) 107 cases.

The initial sample determinations were projected to determine the number of prescriptions and pharmacies. First, the number of prescriptions required to produce number of interventions was projected. The numerator was the number of interventions required and the denominator was the CPhIS average mean intervention rate of 1.4 interventions per 100 prescriptions. The required number of interventions could be obtained from an estimated 84,214 prescriptions (1179 / 0.014). Second, the number of pharmacies required for the study was estimated. The numerator was the total number of prescriptions and the denominator was the average annual number of ASEBP prescriptions per pharmacy. It was assumed an average Alberta pharmacy dispensing 33,800

prescriptions annually would dispense 675 ASEBP prescriptions (2% of total annual prescription volume of 33,800). The total number of pharmacies was projected to be 125 (82,214 / 675).

Pharmacy Recruitment and Assignment

Based on ASEBP claims reports, it was calculated that the following distribution would provide a representative sample for the study: 50% from Edmonton and surrounding areas and 50% from the remainder of the province (including metropolitan areas of Red Deer, Lethbridge, Medicine Hat and Grande Prairie).

ASEBP provided pharmacy specific claims data to assist in the process of recruitment. Claims data for all Alberta pharmacies was provided for the last quarter of 1994. Edmonton, Red Deer, Grande Prairie, Lethbridge and Medicine Hat were identified as the regions with the highest number of plan beneficiaries and dispensing activity. Calgary was excluded because school board staff and dependents were not members of ASEBP.

Recruitment in all metropolitan areas outside of Edmonton, reached target levels except in Red Deer. Initial inclusion criteria limited participation to those pharmacies dispensing at least 720 prescriptions annually (60 prescriptions per month) to ASEBP beneficiaries. This inclusion criterion was later waived when more pharmacies were needed in the sample.

Two cycles of active recruitment were done. Pharmacies were recruited in June 1995 for the initial study phase and in May 1996 for the expansion phase. A series of advertisements in "Communications", the monthly APhA newsletter sent to all licensed

pharmacists, plus telephone solicitations to high-volume providers were used in tandem. Pharmacists expressing interest in participating were provided with a study information kit. Follow-up telephone contact was made with the pharmacies within one week. Pharmacy managers were sent a pharmacy participation agreement and pharmacist consent forms for formal enrollment. Example agreement and consent forms are included in Appendix B. For phase one of the study, telephone solicitation resulted in 66 pharmacies (109 contacted) consenting to participate. Common reasons pharmacists gave for not participating included "too busy for the commitment", "too many recent staff changes", "new management", "conversion from independent to chain ownership", "no approval from corporate office" and "not interested in the model". Seven additional pharmacies that participated in phase one of the study were recruited through responses to advertisements in "Communications" and through recruitment efforts at the APhA's 1995 annual meeting. Eligibility criteria restricted study participation to community pharmacies; outpatient hospital pharmacies were excluded. Moreover, the pharmacy had to dispense one or more prescriptions to ASEBP beneficiaries each month. This process resulted in sample of 73 volunteer pharmacies in phase one of the PIER project.

Three months after the study launch, a lower than anticipated cognitive service claim rate forced a second round of pharmacy recruitment. The recruitment strategies used in phase one, advertisements, telephone solicitations, and follow up, were repeated for phase two in an attempt to double the sample size. Thirty-nine pharmacies volunteered to participate in phase two. The total number of pharmacies recruited for participation in the PIER project was 112.

Pharmacies were randomly assigned, independent of geographical region, to one

of the three study groups. Once assignment was completed, pharmacies were formally notified in writing of their assignment. Some assignment problems were encountered with department store pharmacies. Corporate policy did not allow the pharmacists to be paid directly for services; pharmacists were limited to reimbursement only by salary. For two corporate pharmacies, the project director recommended that payments for Group C pharmacists be made to the store with the intent that an educational trust be established in lieu of direct payments to the pharmacist. Pharmacists would receive benefits indirectly by accessing the educational trust.

Pharmacist Orientation and Training

A four-hour project orientation and training session was conducted for pharmacists. Twelve sessions were given in August and September 1995, in five cities (Edmonton, Grande Prairie, Lethbridge, Medicine Hat, and Red Deer). One hundred-sixty pharmacists attended the sessions. This represented a participation rate of 41.6% (160/385). The orientation sessions consisted of an overview of the study, trends in pharmacy alternative reimbursement, and group discussions. Also, pharmacists participated in an interactive training session manually documenting claims for ten sample cases. As an incentive for pharmacists to attend, the orientation and training sessions were accredited for two continuing education units. Each pharmacy was provided with two copies of the official PIER pharmacist training manual, an overview article about pharmacy alternative reimbursement (Braden, 1995), and some practice case studies for use during the sessions (see Appendix C).

In the expansion phase, when the pharmacy sample size was increased by 50%, a

different strategy was used for pharmacist orientation and training. A self-study program was developed for the pharmacists. A pharmacist contact person in each pharmacy was designated and the contact was provided with a package of written materials for all pharmacists working in the pharmacy. The package included the official pharmacist training manual, an overview article about alternative reimbursement (Braden, 1995) and the case studies. Key areas from the training manual were highlighted. Pharmacists were instructed to review the materials and complete the cases for the orientation to the project. No attempts were made to verify whether expansion phase pharmacists completed the orientation as requested. Pharmacists were encouraged to contact phase I pharmacies located in their region for assistance. An Internet web site was created with copies of the slides used in the 1995 regional orientations along with an invitation to contact the study coordinator. Unlike the phase 1 orientation, the self-study program was not accredited for continuing education units.

Pharmacy Communications Strategies

Ongoing communication strategies attempted to inform pharmacists about the project status and to maintain pharmacists' interest in the project. The primary target audience was participating pharmacists and the secondary audience was other Alberta pharmacists.

An official PIER Project Newsletter was sent on a regular basis to all participating pharmacies from the commencement of the claims collection phase of the project, in August 1995, to the completion of this phase in March 1997. Fourteen issues of the newsletter were sent out. Initially, the newsletter provided procedural reminders and

changes to participants. One issue of the newsletter (February 1996) requested suggestions to boost the claims volume. After the first six months, the purpose of the newsletter shifted to advise pharmacists of the status of the project and the frequency changed from quarterly to a monthly basis. It was anticipated that providing pharmacists with aggregate performance information, examples of interventions, and timely progress reports would improve or maintain project interest and participation. The typical content of the newsletter from March 1996 to March 1997 included sections with project statistics, examples of actual PIER claims submitted and information for pharmacists about project changes. An example of one issue of the PIER newsletter is included in Appendix D.

The APhA's "Communications" monthly newsletter was initially used for recruitment; later, it acted as a vehicle to provide information to all Alberta pharmacists about the status of the project. Project status reports were provided in articles on a quarterly basis.

In addition to telephone access to the project coordinator and assistants, two other forms of communications were employed. First, two surveys of pharmacists were conducted within the first six months of study launch. The first was a fax response survey while the second was an open-ended question telephone interview. The major purpose of the surveys was to determine reasons for the low responses and to obtain information about potential strategies to improve the research design. The second communication strategy was implemented in April 1996 when three corporate pharmacy organizations, Shoppers Drug Mart, Safeway, and London Drugs, were contacted. The purpose of the contacts was to obtain feedback about the project and to maintain

corporate interest in the project. The contacts were provided with information about their respective pharmacy's claim submissions, asked for suggestions about ways to increase claims volume, and requested to monitor and promote the project with their pharmacies.

Data Collection

A multi-copy form was used for each documentation/claim. A copy of the form is included in Appendix E. Participating pharmacies had an initial supply of 20 blank forms for use and were instructed to contact the study coordinator to obtain additional copies.

The dual-purpose documentation/claim form collected basic information about the pharmacist intervention and provided a coding system for billing purposes. The form came from the Washington CARE project (Christensen, 1996) and was adapted for use in Alberta. The drug-related problems, and the specific drug implicated, were recorded to permit an assessment of drug utilization outcomes. Table 3.2 summarizes data collection elements.

Table 3.2 Claim/Intervention Form - Data Fields and Definitions

Data field	Definition
Site identification (ID) #	Pharmacy three-digit APhA identification number
Subscriber ID # + date of birth	Plan holder's ASEBP identification number + date of birth (to differentiate plan holders and dependents)
Date	Date service provided
Prescription #	Prescription number claim pertains to
Pharmacist ID #	Pharmacist's four-digit APhA license number
Initial	Initials of pharmacist who performed service
Total Time (Min.)	Total time to the nearest minute to complete service (not including documentation time)
Original Rx Information	Drug identification number (DIN), quantity and days supply for original prescription
Dispensed Rx Information	Drug identification number (DIN), quantity and days supply for dispensed prescription
Problem	Drug-related problem detected as defined in cognitive service elements (only one per form)
Intervention	Pharmacist intervention performed as defined in cognitive service elements
Result	Result of intervention as defined in cognitive service elements
Effect on Long term Disability	Pharmacist's assessment if service performed has effect on individual's long term disability
ASEBP Plan Number	Plan 1 = $8.50 limit on dispensing fee Plan 2 = $5.50 limit on dispensing fee
Comments	Free text section for pharmacist to add supplementary information
Code #	Pharmacist's six-digit billing code for service performed

Initially, pharmacists were requested to submit only claims for value-added interventions and a limit of two claims per patient per month was imposed. For the purpose of the project, a value-added service was considered a service over and above any required professional services included in the dispensing fee and described in the definitions of cognitive services (see Appendix F). After the low claim rate was observed over the first six months of the study, beginning in March 1996, pharmacists were

requested to submit all claims. This change was made to reduce any confusion by pharmacists as to an intervention being value-added or not. The project coordinator reviewed incoming claims to determine if the claim could be considered as value-added.

System for Classifying Cognitive Service Activities

The PIER pharmacist cognitive services definitions identify three elements to the service: a drug-related problem that needed to be addressed, a pharmacist's intervention, and the result of the intervention. The system was based on the Washington project and was adapted for use in Canada. There were a total of 46 service components: 24 types of drug-related problems, 10 pharmacist interventions, and 12 results of the intervention. The drug-related problems were subdivided into four types: non-optimal prescribing, drug-specific problems, patient-specific problems, and patient seeking care. The approach used for classifying pharmacist cognitive services was similar to that used by other health care providers such as physicians and dentists use to select diagnostic and procedural codes when billing for services (St. Anthony Publishing, 1998). Table 3.3 shows the components of the PIER classification system.

Table 3.3 Components of Classification System for Pharmacist Cognitive Services

Drug-related problem	Pharmacist intervention	Results of intervention
Non-optimal prescribing - drug - dose - dosage regimen - dosage form - duration of use - unnecessary drug therapy Drug specific - therapeutic duplication - drug interaction - disease interaction - allergy / intolerance - food interaction - lab test interaction - Adverse drug reaction (ADR): preventable - ADR: observed - complex administration - other specific problem Patient specific - over-utilization - under-utilization - communication difficulty - case managed - other improper drug use Patient seeking care - with symptoms - NO symptoms - other non-drug problems	- consult prescriber (phone/fax) - consult prescriber (in person) - consult pharmacist at other pharmacy - consult patient - patient assessment - patient training - review profile or chart - review laboratory tests - review literature - other	- change to drug of choice - add Rx drug therapy - therapeutic substitution - add over the counter (nonprescription) drug therapy - change dose - change dosage regimen - discontinue drug - do not dispense - trial prescription - counsel patient - referral - dispense as written

A two-digit code was used to identify each problem, intervention, and result category. Pharmacists were responsible for categorizing drug-related problems detected, the type of intervention performed, and the observed result. Classifying the pharmacist's professional service was a prerequisite for billing. The problem/intervention/result

definitions were adopted from the Washington CARE project; they are included in Appendix G. The definitions were provided to pharmacists in the project manual and in the orientation.

Collection Procedure

Pharmacists were requested to forward to the project coordinator, a copy of the completed claim form by fax (within three days of performing the intervention) and to send an original by mail (within one month). Claim forms were returned by the pharmacist to the coordinator's office for editing. Each claim form was reviewed by the coordinator for completeness and the pharmacist was contacted if any data fields were missing, difficult to read, or did not make sense. Claim forms were submitted on a quarterly basis to ASEBP for payment. ASEBP staff verified the subscriber ID and drug numbers from the prescription database. Cheques were issued by ASEBP according to the payment group assignments. ASEBP used a manual system to issue cheques and on average pharmacies were paid within 6 months of the claim.

Data collection spanned 18 months, from October 1995 to March 1997. This included a six-month extension from the initially planned twelve-month collection period. Two delays were encountered at the start up. A change in start date was made from September 1, 1995 to October 1, 1995, as additional time was needed to conduct pharmacist orientations because a large number of pharmacists were unable to attend the August orientations (due to vacations). A second ten-day delay occurred because of a delay in receiving final ethics approval from the University.

There was one potential confounder over the 18-month period that may have had

an impact on the data collection procedure. On July 1, 1996 ASEBP changed its claims processor from Assure (Shared Health Services) to Alberta Blue Cross. The client identification card was changed and pharmacists were able to perform direct on-line adjudication for dispensing prescriptions through the Blue Cross Pride Real-Time system. The change made it difficult for pharmacists to differentiate ASEBP beneficiaries from other Blue Cross clients. Before the change, pharmacists would use the Assure adjudication process as a screen for an ASEBP client. After the change, pharmacists were unable to screen for ASEBP clients based on an adjudication process. The pharmacist had to have a greater individual knowledge of their client's drug benefit plan to screen for ASEBP clients.

Additional Data Sources

Pharmacist Data

For pharmacists submitting claims, additional information was collected from other databases. The APhA's database provided pharmacist age and gender information and pharmacy names, type of pharmacy, and location. Because the project was based at the APhA, the database was readily available for the operational component of the project.

Other Data

Drug cost information was obtained from the Alberta Medis (wholesaler) price catalogue or, if the drug was in the provincial low-cost alternative program, from the Alberta Health Drug Benefit List. The alternative was to use the actual acquisition cost information supplied by the pharmacy which can be quite variable. Standardized book

pricing was selected over actual acquisition costs to reduce the variability in cost determinations.

The initial research design included linkage between the documentation/claim data and the ASEBP long-term disability files. Because of the small number of documentation/claim forms submitted, only one client on long-term disability received a pharmacy professional service claim. As a result, the research linkage was not pursued.

Data Entry and Analysis

The analysis of the claims data was quantitative. Claims data were entered into an SPSS database (SPSS, 1993). A summary of the experimental hypotheses, variables tested and statistical tests used is shown in Table 3.4. The independent variable for each test was payment group membership.

Table 3.4 Hypotheses, Dependent Variable and Statistical Testing Summary – For Experimental Hypotheses

Hypotheses	Dependent Variable	Measure	Statistical Test
#1 (a)	Cognitive services	Prescription frequency with /without cognitive service claims	Chi-square
(b)		Claim frequency by PIER problem, intervention and result category	Chi-square
#2 (a)	Drug Utilization	Claim frequency with/without drug	Chi-square
(b)		Claim frequency by selected AHFS drug class category	Chi-square
#3	Cost	Net cost (drug cost saving minus cognitive service payment)	ANOVA / Kruskal-Wallis

Two analyses were performed for hypothesis #1. In the first analysis (frequency), data were cross-tabulated in a 2 X 3 table comparing according to payment group (A, B and C), the number of prescriptions dispensed with cognitive service claims to the number of prescriptions dispensed without cognitive service claims. A chi-square test was performed. In the second analysis, cognitive service characteristics, (individual problem, intervention and result categories) were compared among payment groups. Data were cross-tabulated for each characteristic (problem, intervention and result types) and payment method (A, B and C). Three separate chi-square tests were performed.

Hypothesis #2 was tested by comparing payment group differences in drugs prescribed and drugs dispensed when cognitive services were provided. Individual drug and therapeutic class data were tabulated for prescribed and dispensed drugs and arranged by payment group. Drugs were grouped according to pharmacologic therapeutic classification in the American Hospital Formulary System (AHFS). Tables were prepared comparing payment group (A, B and C) and cognitive service frequencies of drugs dispensed and prescribed. Chi square statistical tests were performed for the two most common classes (anti-infectives and central nervous system agents).

The analysis for hypothesis #3 examined the differences in drug cost avoidance between payment groups. Data were tabulated on prescribed drug costs, dispensed drug costs, and pharmacy payments and arranged according to payment group. Cost avoidance was determined in two steps. First, the drug cost saving (Nd) was calculated as the difference between the prescribed drug costs (Pd) and dispensed drug cost (Dp). Second, the cost avoidance was calculated as the difference between drug cost savings (Nd) and pharmacy payments (Pp). Both aggregate and median costs were determined. Both

parametric and non-parametric tests (ANOVA and Kruskal-Wallis tests) were used to evaluate if there was a statistically significant difference in net cost among the payment groups.

The statistical tests summarized in Table 3.5 and were performed to compare the characteristics of claim submitters and the total PIER population.

Table 3.5 Statistical Tests For Comparison of Characteristics for Claim Submitters and Total PIER Population

Characteristics	Statistical test
Pharmacy	
• ownership type	Chi-square
• location	Chi-square
Pharmacist	
• gender	Chi-square
• ownership type	Chi-square
• location	Chi-square
• age	t-test / Mann-Whitney
• years practice	t-test / Mann-Whitney

Pharmacist Survey

The interviews were designed to explain the results of the experiment. A telephone interview instrument was developed to assess pharmacists' perceptions and opinions about the structure of the PIER project and the fee-for-service payment model being tested.

Instrument Development

The content of the instrument was influenced by feedback obtained from pharmacists during the first seven months of the study. In February 1996, participating

pharmacists were sent a "fax back" questionnaire about the project. In May 1996, an unstructured interview with one pharmacist from each participating pharmacy was conducted to obtain feedback about the project design and suggestions about improving participation in the study. Based on the feedback (Appendix G), three broad areas were identified for further investigation: perceptions about obstacles, opinions concerning actual impact, and understanding of the value-added concept.

Pharmacist survey instruments utilized in two other pharmacy reimbursement evaluation projects were reviewed (Dumas, 1994; MacKeigan, Segal and Coyte, 1995). A telephone interview format was selected as the primary method for data collection because of the advantages of both the ease and speed of collecting responses with this technique. Both open ended and close-ended questions were developed. For close-ended questions, four and five-point itemized rating scales were selected for their simplicity of use in the telephone interview format. Three drafts of the PIER instrument were developed and revised. A fourth draft was used for a test reading of the instrument. Two pharmacist staff members at the APhA were interviewed to evaluate the clarity of the instrument and assess the length of time for completing the interview. The test reading of the questions was conducted over the telephone with an allowance of 30 seconds for each response. Questions were reworded for clarity based on the responses from the test reading. The number and type of questions were adjusted in the final version of the instrument to allow it to be administered in 15 to 20 minutes. The interview guide is included in Appendix H.

The interview guide was organized into four main sections. Section 1 included questions about the pharmacy practice environment. Section 2 assessed obstacles to the

PIER project: pharmacists were asked whether there were inherent or identifiable project design and operational obstacles to the intervention documentation/claim process. Section 3 measured pharmacists' opinions and perceptions about the impact of the project. Finally, Section 4 evaluated the pharmacists' overall understanding of the project and the "value-added" concept. The scenarios were patterned after the case studies used in the orientation. Table 3.6 lists specific information collected in each section.

Table 3.6 Data Collected in Pharmacist Interview Guide

Section 1: Practice Profile	• hours worked per week in the study pharmacy • prescriptions personally dispensed per week • number of pharmacist interventions performed per week • percentage of work time spent on dispensing related activities, consultative activities, non prescription drugs related activities, and other activities • percentage of work time spent with a technician • percentage of work time spent with another pharmacist
Section 2: Obstacles to the PIER Project	• clarity of problem, intervention and result definitions used in pharmacist cognitive service elements • ease of documentation • preference for electronic documentation • suggestions for improving documentation • attendance at orientation sessions • adequacy of training on documentation • access and ease of use of training and reference manual • value of newsletters • individual pharmacist's approach towards documentation • other concerns and suggestions
Section 3: PIER Project Impact Assessment	• awareness of alternative reimbursement strategies • knowledge of which reimbursement group the pharmacy belonged to • impact of reimbursement on performing and documenting interventions • interventions performed but not documented • opinion about linking salary to documenting interventions • impressions about increasing the proportion of the pharmacist direct share (greater than 50%) • impact of project participation on performing and documenting interventions • time spent performing interventions • influence on problem identification • extent to which behaviour was influenced • opinion about the two test reimbursement models
Section 4: Understanding of the PIER Project	• Scenario #1: Arthrotec prescribed QID when a TID dose regimen recommended; pharmacist calls physician to change order • Scenario #2: Patient requests refill; current prescription has no refills; pharmacist calls physician for refill authorization • Scenario #3: Young patient receives an inhaler and aerochamber; pharmacist devotes 10 minutes on training patient to use inhaler • Scenario #4: Pharmacist counsels patient on correct use of tetracycline for acute infection • Scenario #5: Prescription for a drug not on the Drug Benefit List; pharmacist identifies an alternative drug and calls physician for a new prescription

Supplemental pharmacist and pharmacy demographic information was obtained from the APhA's directory and from the PIER documentation/claim database. The use of supplemental information reduced the number of telephone interview questions required. The following supplemental information was obtained: pharmacist license number, gender, age, number of years licensed in Alberta, pharmacy license number, pharmacy location, pharmacy type (independent or other), pay group that the pharmacy was assigned to, and if the pharmacist submitted a documentation/claim form.

Sampling Frame

The sampling frame was limited to any practicing pharmacist listed in the APhA's directory. A total of 329 pharmacists were identified as being eligible for the survey as a result of working in a study pharmacy. The APhA's directory includes the pharmacist name and practice location, and each pharmacy name, address, and telephone number. The APhA's directory of pharmacists was compared at the start date of October 10, 1995 and at November 6, 1996. The presence of a specific name in both the start list and the second list meant that the pharmacist was counted as being retained. A comparison with the 1995 study records showed that 56 pharmacists were no longer listed as practicing at the respective study pharmacies in 1996. No attempt was made to locate or contact the 56 pharmacists. The retention rates in each study group are shown in Table 3.7.

Table 3.7 PIER Pharmacist Retention Rates in First Year (October 1995 to October 1996)

	Total at Start	Total after One Year	Percent Retained
Group A (control)	109	90	82.6%
Group B (test)	151	130	86.1%
Group C (test)	125	109	87.2%
Total	385	329	85.5%

Interview Format

Pharmacists were notified in advance about the telephone interviews through the project newsletter and by a personal letter. The list of eligible pharmacists were divided randomly into three lists; one for each interviewer. Work and home telephone numbers were obtained from the APhA database. Initial telephone contacts and interviews occurred over February 16 to 23, 1997. Most calls were made over this time period; however, there were a few follow-up contacts and delayed interviews conducted after the one-week period. The interviewers contacted each pharmacist at their work telephone number, introduced themselves, provided background information about the interview, and if necessary booked a time for the interview. Three attempts were made to contact each pharmacist. Telephone interviews were conducted at the pharmacist's convenience (days or evenings) and either at the pharmacist's work or home. Responses to all questions were documented directly on the interview guide.

Selecting and Training of Interviewers

Three third-year pharmacy students were recruited as interviewers from the

University of Alberta Faculty of Pharmacy and Pharmaceutical Sciences. Two female and one male interviewer were selected based on individual communication skills. The interviewers were expected to make the initial contacts and conduct the telephone interviews. The students' training consisted of two and a half days of briefings by the project coordinator. Students were briefed extensively on the contents and purpose of the interview instrument. The student interviewers conducted practice telephone interviews among themselves and with APhA staff.

Editing, Entry and Analysis of Interview Data

The analysis of interview data was both quantitative and qualitative. Data was collected from each interview guide. Data from close-ended questions were edited, coded and tabulated into an SPSS database (SPSS, 1993). The responses "do not know" and "no answer" were considered missing values.

Descriptive statistics were calculated for survey respondents: age, years licensed, gender, ownership type, location, prescriptions dispensed, hours worked, work time apportionment, and work time with other staff. Chi-square and t-tests were performed to compare the characteristics of survey respondents and the total population of PIER pharmacists. Workload statistics were not included in the analysis as similar statistics were not available for non-respondents.

Closed-ended question responses were tabulated for the three subgroupings of questions: perceived obstacles, impact and understanding. Frequency distributions were tabulated for individual questions. The data were visually inspected. Grouping of response frequencies was required in the interpretation of results.

Data from all open-ended questions was collated in Microsoft Word (Winter and Winter, 1997). A content analysis was performed independently by the project coordinator and one student (S. McDonald). For each open-ended question, the frequency of significant words, phrases and themes were identified and counted. Items were highlighted and color-coded. A frequency distribution of common items for each question was developed. Common and contrasting themes were identified. Representative examples of frequent comments were extracted, and are presented in Appendix I.

Validity of Survey Instrument

An appropriate standardized instrument to explain the behaviour of pharmacists was not available.

The instrument's validity was demonstrated as follows. Content validity was determined through the process used to develop the instrument. Test instruments developed and used for similar research (Dumas, 1994; MacKeigan, Segal, Coyte, 1995) were reviewed in detail. Three drafts of the instrument were developed and reviewed with the program supervisor (John Bachynsky) and the third draft was reviewed with one member of the program supervisory committee (L MacKeigan). Feedback from the two content experts (John Bachynsky and L. MacKeigan) was used to revise the instrument.

PIER Project Case Study

The case study is a qualitative research technique that was used to explain the findings from the PIER project, in a policy context. At least one pharmacy

reimbursement system evaluation used this approach; the Iowa Capitation model (Yesalis and Levitz, 1985). In case study research, questions are not intended to test hypotheses but are meant to identify special features of the case and explore conceptual and contextual issues. For the PIER project, two primary questions were addressed by the case study:

(a) What policy making process produced the new financial incentive and what were the features of the incentive?

(b) How do affected organizations interpret this financial incentive and respond in ways that might give insight into its "incentive" properties?

The secondary questions were developed and examined within the case study framework. Secondary questions addressed issues of the "policy" making process and the interpretation and responses to the incentive. Table 3.8 lists the secondary case study questions addressed.

Table 3.8 Secondary Case Study Questions

Topic	Question
Policy making process and key features of the financial signal	- how was the payment model selected? - how was the payment schedule selected? - What was the setting for the project? - What methods were used to communicate the signal? - who was the target, what behaviour was desired, and how was the terms of exchange for the financial signal? - What were APEC expectations from the policy? - who were the interested "stakeholding" organizations?
Interpretations and response to financial signal	- what did pharmacy organizations perceive as the primary objective of the financial signal to be? - how did pharmacy organizations describe the financial signal? - What pharmacies were eligible to participate and who actually participated? - What were the pharmacy interpretations and responses during the progression of the study? - What did the results of the documentation/claim form data and pharmacist survey results indicate about the PIER project and reveal about pharmacist interpretation of the financial signal?

Data Collection and Analysis

The data collection and analysis approach used in a previous pharmacy reimbursement case study was adapted for use in this research (Grootendorst, Goldsmith, Hurley, O' Brien and Dolovich, 1996). Substantial data were available from the experiment (claims documentation) and interviews (interview guides). In addition, the study coordinator collected documentation throughout the project that illuminated stakeholders' perceptions and responses to the PIER project. Project coordinator files contained correspondence, file notes, interim progress reports, and miscellaneous data. The project coordinator's personal recollection of events was used to supplement written data.

Analysis consisted of interpreting the data in the context of the four-part communication model (Giacomini et al., 1996). Segments of explanatory data were categorized as being related to the policy development process, characteristics of the reimbursement model, how pharmacy organizations interpreted the reimbursement and how pharmacists responded. The analysis consisted of the researcher interpreting the meaning of data within the same four categories and as a complete communication model. A summary flow diagram was developed and commentaries made which placed the PIER project into the context of the communications model.

A number of problems were encountered in the use of the communications model. First, the model assumes the payer takes the lead role in determining funding policy. This was not the situation between the payer (ASEBP) and an agent for the affected organizations (APEC) in the PIER project. APEC functioned as the lead agent in the development of the PIER funding policy change. This situation is not consistent with the directional flow described in the communications model. This made the description of the policy making process less straightforward. Second, the PIER project was designed and marketed as a pilot project for a potential funding policy and was therefore at best only a temporary policy. The communications model is geared towards permanent and public sector policy changes. This would influence pharmacy organizations' interpretation and response to the financial signal. Finally, of the three different research designs used, the case study was the most difficult to fit into the traditional dissertation format. For example, although the description of the policy making process and the financial incentive signal are results from the case study, the two were very much linked with the methodological discussions for the experiment. As such, both the description of

the policy making process and the description of the financial incentive were included in the result chapter.

CHAPTER IV

RESULTS

Results of the experiment, pharmacist survey and case study are presented in turn. The experiment shows the effect that the fee-for-service payment model had on pharmacy practice and drug utilization, and its economic impact. The pharmacist interviews reveal pharmacists' perceptions about the payment model. The results of the case study show how pharmacists and pharmacy organizations understood the meaning, interpreted and responded to the reimbursement incentive signal.

The characteristics of PIER project pharmacies and pharmacists are shown in table 4.1 and 4.2 respectively.

Table 4.1 Characteristics of Pharmacies in PIER Project (n=112)

Characteristics	# Pharmacies (percent) Group A - control	# Pharmacies (percent) Group B - test	# Pharmacies (percent) Group C - test	Total
Ownership type				
• Independent	16 (14.3)	12 (10.7)	18 (16.1)	46 (41.1)
• Chain / franchise	18 (16.1)	28 (25)	20 (17.9)	66 (58.9)
Subtotal	34 (30.4)	40 (35.7)	38 (34)	112 (100)
Location				
• Edmonton / surrounding areas	16 (14.3)	24 (21.4)	14 (12.5)	54 (48.2)
• Other areas	18 (16.1)	16 (14.3)	24 (21.4)	58 (51.8)
Subtotal	34 (30.4)	40 (35.7)	38 (34)	112 (100)

One pharmacy initially signed up but dropped out of the study before data

collection began.

Table 4.2 Characteristics of Pharmacists in PIER Project (n=385)

Characteristics	Mean (standard deviation)	Percentage
Age (years)	38.6 (+/- 10)	-
Time licensed with APhA (in years)	14.9 (+/- 9.8)	-
Gender		
• Female	-	54.3
• Male	-	45.7
Ownership type		
• Independent	-	50.6
• Chain / franchise	-	49.4
Location		
• Edmonton / surrounding areas	-	51.2
• Other areas	-	48.8

Experiment

The characteristics of pharmacies and pharmacists submitting PIER claim / intervention documentation are shown in Tables 4.3 and 4.4 respectively.

Table 4.3 Characteristics of Pharmacies Submitting PIER Documentation (n=49)

Characteristics	# Pharmacies (percent) Group A - control	# Pharmacies (percent) Group B - test	# Pharmacies (percent) Group C - test	Total
Ownership type				
• Independent	7 (14.3)	6 (12.2)	7 (14.3)	20 (40.8)
• Chain / franchise	10 (20.4)	10 (20.4)	9 (18.4)	29 (59.2)
Subtotal	17 (34.7)	16 (32.6)	16 (32.6)	49 (100)
Location				
• Edmonton / surrounding areas	7 (14.3)	7 (14.3)	5 (10.2)	19 (38.8)
• Other areas	10 (20.4)	9 (18.4)	11 (22.4)	30 (61.2)
Subtotal	17 (34.7)	16 (32.6)	16 (32.6)	49 (100)

Claims were received from 49 pharmacies. Twenty six claims were received from two control pharmacies (15 claims were received from a phase 1 pharmacy and 11 claims from a phase 2 pharmacy) accounting for 49% of the total control group documentation. Without these two outliers, the number of control group claims was reduced by half. The top five pharmacy claims producers accounted for 35.3% of all claims. Eight pharmacies submitted five or more claims. In only 15 pharmacies did more than one pharmacist submit claims. The 15 pharmacies accounted for 58.1% (79/136) of the total claims.

Chi-square tests were performed to compare by ownership and location characteristics of claim-submitting pharmacies and the total sample of PIER pharmacies. There were no statistically significant differences between claim submitting pharmacies and the total sample of PIER pharmacies.

Table 4.4 Characteristics of Pharmacists Submitting PIER Claims / Intervention Documentation (n=69)

Characteristics	Mean (standard deviation)	Percentage
Age (years)	35.1 (+/- 9.4)	-
Time licensed with APhA (in years)	11.0 (+/- 8.5)	-
Gender		
• Female	-	65.7
• Male	-	34.3
Ownership type		
• Independent	-	52.2
• Chain / franchise	-	47.8
Location		
• Edmonton / surrounding areas	-	50.7
• Other areas	-	49.3

Sixty-nine pharmacists submitted claims. Thirty-one pharmacists (45% of submitters) submitted more than one claim; these pharmacists submitted 71.3% of all claims. One pharmacist submitted 10 claims (7.4% of all claims) while five pharmacists submitted five or more claims.

The analysis of non-respondents showed the following. Pharmacists submitting claims were younger and licensed fewer years compared to the total sample of PIER pharmacists. A greater proportion of female pharmacists submitted claims compared to the total sample of PIER pharmacists. The results of parametric testing (t-tests) showed a statistically significant difference $t(383) = 3.21$, $p=0.001$ (for age) and $t(383) = 3.65$, $p=0.000$ (for time licensed). Nonparametric tests resulted in the Mann-Whitney statistic = -3.48, $p=0.0005$ (for age) and the Mann-Whitney statistic = -3.68, $p = 0.0002$ (for time

licensed). The results of chi-square testing showed a statistically significant difference in the gender χ^2 (1) = 4.24, p=0.040 between claim submitters and the total sample. There were no statistically significant differences between claim submitters and the total sample for pharmacy ownership $\chi 2$ (1) = 0.08, p=0.77 and for location χ^2 (1) = 0.006, p=0.94.

Data Editing

Data editing took place when the study coordinator received the information from a pharmacy; verification occurred with ASEBP's database prior to payment. All 16 data fields were edited for accuracy and completeness. Pharmacists were contacted via telephone to clarify fields with missing data or requiring editing. Table 4.5 summarizes the frequency of edits by data fields. One data field (the patient's date of birth) was missing or required editing on 82% of claims. The high edit rate was due to an omission; the need for recording the date of birth was not discussed in the orientation program and a space for this entry was omitted on the first printing of the claims forms. This piece of information was needed to differentiate the cardholder and individual dependents, as the plan used only a single number to identify families. The ASEBP plan number was missing or required correction in 35% of claims. Other fields commonly requiring editing were the original prescription drug identification number (DIN), the days supply field, and the effect of the intervention on long-term disability status. In a sizeable number of claims (30/136 or 22%), five or more individual data elements were missing or required editing. As a result of the two-stage edit process, all claims, with one exception, were useable.

Table 4.5 Summary Claim/Intervention Form Edits

Field		# of Edits Required	Percentage of Total Claims (n=136)
Site ID		2	1%
Patient identification #		28	21%
Date		0	0%
Prescription #		7	5%
Pharmacist ID #		1	1%
Pharmacist Initial		1	1%
Intervention Time		3	2%
Patient DOB		112	82%
Original	DIN #	36	26%
	Quantity	31	23%
	Days Supply	30	22%
Dispensed	DIN #	20	15%
	Quantity	18	13%
	Days Supply	17	13%
ASEBP Plan #		47	35%
Problem type		2	1%
Intervention type		0	0%
Result type		0	0%
Effect on LTD Status		33	24%
Code		0	0%
Total Claims		136	
Additional supplementary information		4	

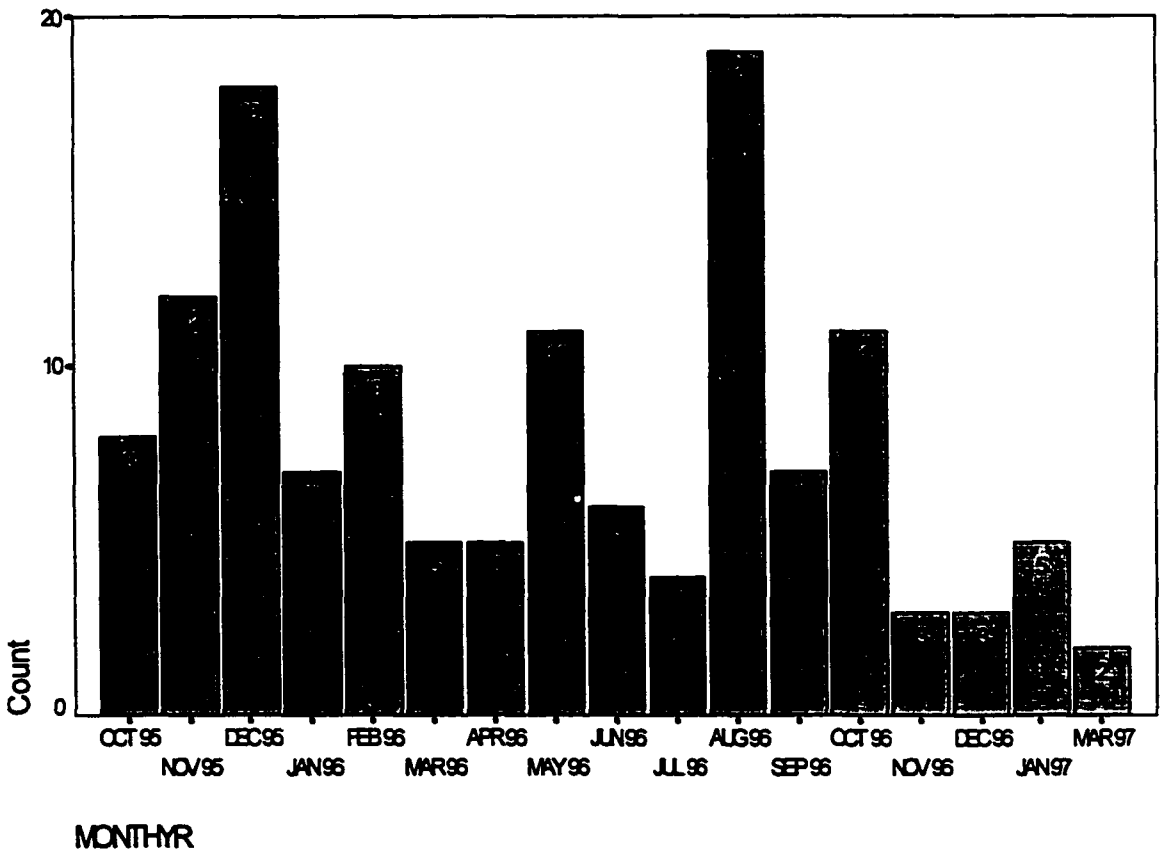
Documentation Analysis

A total of 136 useable claim/intervention forms were submitted to the study coordinator over the 18-month period. Two claims out of all cognitive service claims were reviewed with pharmacists and were returned as failing to meet the value-added criterion. Both returned claims were for routine refill authorizations and were not considered in the analysis. Most claims were submitted by fax. On average, there was a 14-day lag time between the pharmacy service date and the date that the study coordinator

received the claim.

On average 7.5 cognitive services were performed each month of the study. The greatest number of claims was in August 1996. Sixty percent of the cognitive services (82 claims) were performed in the first 9 months of the study. The number of monthly claims decreased from more than 9 per month in the first 9 months of the study to 6 per month in the second 9 months. Figure 4.1 shows the number of cognitive services performed over each of the 18 months.

Figure 4.1 Frequency of Cognitive Services by Month



Note: The month was determined based on the date when the cognitive service was provided. There were no claims received in February 1997.

A greater number of claims, 109 (80% of the total claims), were submitted by

pharmacists who enrolled in the study in October 95 (phase I) compared to those who enrolled in July 96 (phase II). Phase I pharmacists submitted an average of over 6 claims per month while phase II pharmacists submitted an average of 3 claims per month.

Comparison of Cognitive Services/Prescriptions Frequencies

Study pharmacists dispensed 193,253 ASEBP prescriptions during the data collection period. Based on the 136 useable forms, the cognitive service claim/intervention rate was 0.07 per 100 prescriptions.

Table 4.6 shows the number of prescriptions and cognitive service claims in PIER project pharmacies. The total number of prescriptions dispensed by study pharmacies in each of the three payment groups was similar.

Table 4.6 Numbers of Prescriptions Dispensed with/without Cognitive Service Claims by Payment Group (October 1995 – March 1997)

	Group A (control)	Group B (test)	Group C (test)	Total
Prescription with cognitive service claims	53	38	45	136
Prescriptions without cognitive service claims	63,332	66,750	63,035	193,117
Total	63,385	66,788	63,080	193,253

Chi-square tests were performed on the proportion of prescriptions submitted with cognitive service claims. There was no significant difference among the payment groups $\chi 2\ (2) = 0.191$, $p=0.91$.

Description of Interventions

Pharmacists identified the problem category "sub-optimal dose" most frequently (16.9% of all problems). Overall, the three most frequently reported problem types (suboptimal dose, drug-other specific problem, and drug-allergy / intolerance) accounted for 45.6% of the problems reported. Eighty-two percent of the problems detected were of the prescription or drug-specific type while only 18% were patient specific. Four of the problem types were not used. Table 4.7 shows the frequency of problem types used by pharmacists.

Table 4.7 Frequency Distribution of Cognitive Service Problem Types

Sub-Group		Overall		Group A (control)		Group B (test)		Group C (test)	
	Problem	N	%	N	%	N	%	N	%
Prescription	Suboptimal drug	7	5.1%	3	5.7%	2	5.3%	2	4.4%
	Suboptimal dose	23	16.9%	12	22.6%	4	10.5%	7	15.6%
	Suboptimal dosage regimen	8	5.9%	2	3.8%	3	7.9%	3	6.7%
	Suboptimal dosage form	2	1.5%	0	0.0%	2	5.3%	0	0.0%
	Suboptimal: unnecessary drug	2	1.5%	1	1.9%	0	0.0%	1	2.2%
Drug Specific	Drug: therapeutic duplication	3	2.2%	0	0.0%	2	5.3%	1	2.2%
	Drug-drug interaction	8	5.9%	1	1.9%	5	13.2%	2	4.4%
	Drug-disease interaction	2	1.5%	1	1.9%	0	0.0%	1	2.2%
	Drug-allergy/intolerance	17	12.5%	6	11.3%	4	10.5%	7	15.6%
	Drug-lab test interaction	1	0.7%	0	0.0%	0	0.0%	1	2.2%
	Adverse drug reaction (ADR): preventable	4	2.9%	3	5.7%	0	0.0%	1	2.2%
	ADR: observed	3	2.2%	0	0.0%	3	7.9%	0	0.0%
	Drug: complex administration	9	6.6%	5	9.4%	1	2.6%	3	6.7%
	Drug: other specific problem	22	16.2%	10	18.9%	5	13.2%	7	15.6%
Patient Specific or Other	Patient over-utilization of drug	3	2.2%	1	1.9%	1	2.6%	1	2.2%
	Patient under-utilization of drug	8	5.9%	4	7.5%	1	2.6%	3	6.7%
	Patient case managed	1	0.7%	1	1.9%	0	0.0%	0	0.0%
	Patient: Other improper use of drug	1	0.7%	0	0.0%	1	2.6%	0	0.0%
	Patient Seeking care: with symptoms	6	4.4%	0	0.0%	4	10.5%	2	4.4%
	Other non-drug problem	6	4.4%	3	5.7%	0	0.0%	3	6.7%
	Total	136		53		38		45	

Categories of cognitive service problem types were grouped for statistical testing due to small sample size. Initially, the problems were aggregated into four sub-groups of problems: non-optimal prescribing, drug-specific problems, patient-specific problems and

patient seeking care. However, there were only 25 observations in the last two sub-groups and less than five observations in some cells. The final comparison was made with three sub-groups: prescription-related, drug-related, and patient-related/others. A chi-square test showed no statistically significant difference in problem types among the three payment groups $\chi 2$ (4) = 0.45, p = 0.978.

Table 4.8 shows the distribution of types of interventions. The most common intervention was "consult prescriber" (by phone/fax or in-person) comprised 64.7% (88/136) of all interventions. The top three intervention types (consult prescriber - by phone, fax or in person, and consult patient) accounted for 83.1% of the total. Only one of the initial ten intervention types was not used.

Table 4.8 Frequency Distribution of Types of Cognitive Service Interventions

Sub-Group		Overall		Group A (control)		Group B (test)		Group C (test)	
	Interventions	N	%	N	%	N	%	N	%
Prescriber or Pharmacist	Consult Prescriber (phone/fax)	71	52.2%	23	43.4%	24	63.2%	24	53.3%
	Consult Prescriber (in-person)	17	12.5%	12	22.6%	2	5.3%	3	6.7%
	Consult pharmacist at other pharmacy	1	0.7%	1	1.9%	0	0.0%	0	0.0%
Patient or Other	Consult Patient	25	18.4%	7	13.2%	8	21.1%	10	22.2%
	Patient Assessment	2	1.5%	1	1.9%	1	2.6%	0	0.0%
	Patient Training	16	11.8%	8	15.1%	3	7.9%	5	11.1%
	Review Profile or Chart	1	0.7%	0	0.0%	0	0.0%	1	2.2%
	Review Literature	1	0.7%	0	0.0%	0	0.0%	1	2.2%
	Other	2	1.5%	1	1.9%	0	0.0%	1	2.2%
	Total	136		53		38		45	

As with the problem categories, individual intervention categories were grouped for statistical testing. Initially, an attempt was made to compare three groups; however, because there were an inadequate number of observations in one group, data were categorized into two groups. The intervention categories were dichotomized into (a) prescriber or pharmacist consultations and (b) patient related and other intervention types, and compared. A chi-square test showed there was no statistically significant difference among the payment groups $\chi 2\ (2) = 0.88$, $p=0.643$.

Overall, the two most frequently reported results of cognitive services, "change dose" and "counsel patient", accounted for 44.2% of the intervention results. In each payment group, a different type of result was most common. "Change dose" was most common in control Group A, "counsel the patient" in test Group C, and "dispense as written" in test Group B. The three highest frequency result types accounted for 59.6% of those reported. Only one of the result types was not used. Table 4.9 shows the frequency distribution of result types reported.

Table 4.9 Frequency Distribution of Types of Results from Cognitive Services

Sub-Group		Overall		Group A (control)		Group B (test)		Group C (test)	
	Result	N	%	N	%	N	%	N	%
Prescription or Drug Change									
	Change to Drug of Choice	21	15.4%	9	17.0%	6	15.8%	6	13.3%
	Add Rx Drug Therapy	6	4.4%	4	7.5%	0	0.0%	2	4.4%
	Substitution: Therapeutic	9	6.6%	2	3.8%	3	7.9%	4	8.9%
	Change Dose	30	22.1%	18	34.0%	7	18.4%	5	11.1%
	Change Dosage Regimen	10	7.4%	4	7.5%	3	7.9%	3	6.7%
	Change Dosage Form	3	2.2%	1	1.9%	1	2.6%	1	2.2%
	Discontinue Drug	3	2.2%	1	1.9%	2	5.3%	0	0.0%
Patient or Other									
	Do not Dispense	4	2.9%	0	0.0%	2	5.3%	2	4.4%
	Dispense Trial Rx	4	2.9%	1	1.9%	0	0.0%	3	6.7%
	Counsel Patient	30	22.1%	11	20.8%	6	15.8%	13	28.9%
	Referral	1	0.7%	1	1.9%	0	0.0%	0	0.0%
	Dispense as Written	15	11.0%	1	1.9%	8	21.1%	6	13.3%
	Total	136		53		38		45	

Cognitive service result types were sub-grouped for statistical testing due to the small sample size. Initial attempts to compare included four subgroups: prescription and drug changes, special prescription services, patient education and dispense unchanged. The final comparison was made between two groups: result types closely related to the prescription or the drug itself, and all other results (patient, special services, education, dispense unchanged). A chi-square test showed a statistically significant difference among the three payment groups $\chi 2\ (2) = 7.49$, $p=0.023$. The proportion of claims for the sub-group drug/prescription change was highest for group A (control), and lowest for group C (test). Conversely, the proportion of claims for the sub-group patient or other changes was highest for group C (test), and lowest for group A (control).

The majority of problems identified and results recorded related to drug and prescription factors. Over 80% of problems and 60% of results were drug or prescription-

related. In the case of results, approximately 65% of interventions were directed to physicians. In the control group, nearly 75% of results reported for problems were drug or prescription-related while in the test groups 50% were drug or prescription-related. The test group provided more patient-related or other cognitive services. The significant difference between the control and test groups in the result mix was a surprise as there were no significant differences in the problem and intervention mixes. It is not clear whether the significant difference in results between payment groups was an artifact from repeated testing or an effect of the financial incentive.

Time to Perform Interventions

Pharmacists reported a mean (and standard deviation) time of 9.13 (+/- 5.85) minutes to complete cognitive service interventions. The mean times for the respective payment groups were 8.25 minutes (Group A), 10.79 minutes (Group B), and 8.78 minutes (Group C). The differences among the payment groups were not statistically significant. The result of the statistical tests for ANOVA was $F(2, 2) = 2.26$, $p = 0.108$ and for the Kruskal-Wallis statistic = 4.09, $p=0.128$.

Patient Characteristics

The claims data reveals that few patients received more than one pharmacist cognitive service. A total of 117 patients received cognitive services. Only 12 patients received more than one service. Ten patients received two services and only two patients received more than two services. The majority of patients receiving two services were in Group A (8/10). One patient in payment Group B received five services and another

patient in payment Group C received six services.

The ASEBP population is composed of school board employees (administration, teachers, support staff) and dependents (spouses, children). The mean age of PIER patients receiving cognitive services was 37.95 (+/- 18.65) years. The median age of PIER patients was 42 (Q_1=20.25 and Q_3=55). The mean age of patients in the respective payment groups was 39.47 (+/- 2.56) years (Group A), 42.23 (+/- 2.85) years (Group B), and 32.53 (+/- 2.76) years (Group C). The result of the statistical test for ANOVA F(2,2) = 3.18, p = 0.045 and for the Kruskal-Wallis statistic = 5.67, p = 0.058. The results for K-S test for normality = 1.58, p = 0.014 suggesting the sample was not from a normal distribution. The difference in patient age was not statistically significant using nonparametric statistics.

Effects of PIER Model on Drug Utilization

Among the drugs prescribed, the anti-infective class was the most common therapeutic drug class involved in claims (33.1%). Drugs in the central nervous system class were the second most frequently involved (18.4%), followed by drugs in the hormone and synthetic substitutes class (11%). Drugs in the top three classes accounted for 62.5% of all claims. Table 4.10 shows the distribution of therapeutic classes of prescribed drugs across the payment groups. Among drugs dispensed, the same three classes of drugs appeared in the same order across the payment groups. These were anti-infectives (32.4%), central nervous system (15.4%) and hormones (11.8%). The three classes accounted for 59.5% of all claims. Table 4.11 shows the distribution of therapeutic classes of dispensed drugs across payment groups.

Chi-square tests were performed comparing among payment groups the frequency

of cognitive service claims by prescribed and dispensed classes of drugs (for antibiotics and central nervous system agents). For the comparison of prescribed antibiotics the $\chi 2$ test results were $\chi 2$ (2) = 0.39, p=0.53 and for dispensed $\chi 2$ (2) = 0.34, p=0.56. The results in the comparison of prescribed central nervous system agents were χ^2 (2) = 0.28, p=0.6 and for dispensed $\chi 2$ (2) = 0.79, p=0.37. There were no significant differences among payment groups in the two classes.

Table 4.10 Distribution of Therapeutic Classes in Drug Related Problems Reported by Pharmacists Before the Intervention

	Overall		Group A		Group B		Group C	
Drug Class	#	%	#	%	#	%	#	%
Anti-infectives	45	33.1	21	39.6	10	26.3	14	31.1
Central nervous system	25	18.4	7	13.2	10	26.3	8	17.8
Hormones and synthetics	15	11.0	8	15.1	3	7.9	4	8.9
Autonomic drugs	10	7.3	3	5.7	0	0.0	7	15.6
Misc GI drugs	8	5.9	0	0.0	7	18.4	1	2.2
Devices	7	5.1	4	7.5	1	2.6	2	4.4
Cardiovascular	6	4.4	3	5.7	1	2.6	2	4.4
Electrolyte, caloric, and water balance	4	2.9	2	3.8	1	2.6	1	2.2
Skin and mucous membrane	3	2.2	0	0.0	2	5.3	1	2.2
Antihistamine	3	2.2	1	1.9	1	2.6	1	2.2
Antitussive, expectorants	3	2.2	1	1.9	0	0.0	2	4.4
Eye, ear, nose throat	3	2.2	2	3.8	1	2.6	0	0.0
Other	4	2.9	1	1.9	1	2.6	2	4.4
Total	136	100	53	100	38	100	45	100

Table 4.11 Distribution of Therapeutic Classes in Drugs Dispensed after the Pharmacist's Intervention

	Overall		Group A		Group B		Group C	
Drug Class	#	%	#	%	#	%	#	%
Anti-infectives	44	32.3	21	39.6	10	26.3	13	28.9
Central nervous system	21	15.4	7	13.2	7	18.4	7	15.6
Hormones and synthetics	16	11.8	9	17.0	3	7.9	4	8.9
Autonomic drugs	8	5.9	1	1.9	0	0.0	7	15.6
Misc. GI drugs	8	5.9	0	0.0	7	18.4	1	2.2
Devices	8	5.9	5	9.4	1	2.6	2	4.4
Cardiovascular	6	4.4	3	5.7	1	2.6	2	4.4
Electrolyte, caloric, and water balance	3	2.2	1	1.9	1	2.6	1	2.2
Skin and mucous membrane	4	2.9	0	0.0	3	7.9	1	2.2
Antihistamine	3	2.2	1	1.9	1	2.6	1	2.2
Antitussive, expectorants	3	2.2	1	1.9	0	0.0	2	4.4
Eye, ear, nose throat	3	2.2	2	3.8	1	2.6	0	0.0
Other or no drug	9	6.6	2	3.8	3	7.9	4	8.9
Total	136	100	53	100	38	100	45	100

The top ten medications involved in cognitive service claims are shown in Table 4.12. The top ten prescribed and dispensed agents constituted 36 and 39% of claims respectively. Visual inspection of the data did not reveal any substantial differences between prescribed and dispensed drugs. Changes to individual anti-infective agents prescribed and dispensed were the most notable difference.

Table 4.12 Distribution of Top Ten Medications – Prescribed/Dispensed

	Prescribed		Dispensed	
Medication	Number	Percent	Number	Percent
Amoxicillin	10	7	6	5
Cotrimoxazole	8	6	7	6
Clarithromycin	6	4	5	4
Erythromycin	5	4	1	1
Naproxen	4	3	3	2
Estrogen	4	3	5	4
Cisapride	4	3	4	3
Metered dose Salbutamol	4	3	4	3
Budesonide	4	3	4	3
Salmeterol	3	2	3	2
Total	52	39%	42	36%

Economic Impact of PIER Payment Model

Table 4.13 summarizes drug cost and pharmacy payment data by payment group. Overall, in the PIER project, the cognitive services reported resulted in a $1078 reduction in drug costs and a net savings of $330. Drug prescribing and dispensing costs, and net drug savings were the lowest in test group B and the highest in group C. Overall, net savings were highest in group C. Combined payments in Groups B and C for alternative reimbursement claims totaled $748. The majority of claims 66/83 (79.5%) were for $8.50, while 11/83 (13.3 %) were for $17.00. A small number of claims 5/83 (6%) were submitted for billing codes with no additional fee payment.

Both parametric and nonparametric tests were performed on net costs. The result of the statistical test for the ANOVA $F(2,2) = 0.831$, $p = 0.438$ while the Kruskal-Wallis statistic = 24.115, $p=0.000$. The K-S test for normality = 3.48, $p = 0.000$ indicating the

sample was not from a normal distribution. Based on the nonparametric test, there was a statistically significant difference in cost avoidance among control and test groups. The direction of the difference was positive for the control group.

Table 4.13 Summary of Drug Costs and Pharmacy Payments (in Dollars)

	Overall n=133		Group A (Control) n=53		Group B (Test) Pharmacy Payment n=37		Group C (Test) Pharmacy and Pharmacist Payment n=43	
	Total Costs	Median Cost (IQR*)	Total Costs	Median Cost (IQR*)	Total Costs	Median Cost (IQR*)	Total Costs	Median Cost (IQR*)
Prescribed drug (Pd)	4925	19.56 (4.90, 49.80)	1569	15.04 (3.02, 48.30)	1247	23.54 (5.98, 62)	2109	20.41 (6.92, 49.80)
Dispensed drug (Dp)	3862	20.41 (4.90, 38.75)	1330	20.41 (3.42, 37.89)	1106	26.87 (8.89, 58.19)	1426	12.68 (4.90, 31.12)
Net drugs (Nd) = (Pd-Dd)	-1078	0 (-4.36, 0)	-260	0 (-2.19, 0)	-135	0 (-2.47, 0)	-683	0 (-6.44, 0)
Pharmacy payment (Pp)	748	8.50	-	-	331.5	8.50	416.5	8.50
Net Cost (Pp-Nd)	-330	2.12 (-0.44, 8.50)	-260	0 (-2.19, 0)	+196.5	8.50 (4.56, 16.14)	-266.5	8.50 (-0.55, 12.62)

Note: The 25th and 75th percentile values for the interquartile range (IQR) are shown in brackets for selected medians.

In summary, the results from the analysis of documentation showed that the PIER fee-for-service reimbursement system had no effect on cognitive services, drug utilization and net costs; pharmacists and pharmacies did not respond to the financial incentive offered. There was no statistically significant difference among payment groups in the number of claims submitted. Also, there was no significant difference between payment

groups in the types of problems or interventions reported; however, a statistically significant difference was seen between payment groups in the types of results of interventions. There were no significant differences in the drug utilization for drug classes dispensed between the payment groups. There was a significant difference in net costs among payment groups. Overall, the combined additional pharmacy cognitive service payments to groups B and C were barely offset by savings in drug costs.

Pharmacist Survey

A total of 187 pharmacists were interviewed. The characteristics of interview respondents are shown in Table 4.14.

Table 4.14 Characteristics of Pharmacist Interview Respondents (n=187)

Characteristics	Mean (standard deviation)	Percentage
Age (years)	36.9 (+/- 8.7)	-
Time licensed with APhA (in years)	13.0 (+/- 8.2)	-
Gender		
• Female	-	63.2
• Male	-	36.8
Ownership type		
• Independent	-	51.1
• Chain / franchise	-	48.9
Location		
• Edmonton / surrounding areas	-	50
• Other areas	-	50

The distribution of pharmacists according to the payment group assignment was control Group A 57 (30.5%), test Group B 65 (34.8%), and test Group C 65 (34.8%).

Slightly more than 25% of the pharmacists who responded to interviews (48/187) also submitted an intervention/claim form.

The following summarizes the analysis of non-respondents. Pharmacists who responded to interviews were younger and licensed fewer years compared to the total sample of PIER pharmacists. A greater number of females responded to the survey compared to the total sample of PIER pharmacists. The results of parametric testing (t-tests) showed a statistically significant difference $t(383) = 3.23$, $p=0.001$ for age, and $t(383) = 3.69$, $p<0.0001$ for years licensed. Nonparametric testing showed the Mann-Whitney statistic = -2.84, $p = 0.0045$ for age and Mann-Whitney statistic = -3.02, $p = 0.0026$ for years. The results of tests showed a statistically significant difference in the gender of pharmacists $\chi^2 (1) = 11.02$, $p=0.0009$ between interview respondents and the total PIER population. There was no statistically significant difference in pharmacy ownership type $\chi^2 (1) = 0.028$, $p=0.87$ or in location $\chi^2 (1) = 0.19$, $p=0.66$ between interview respondents and the total population.

PIER Project Obstacles[2]

Pharmacists were asked whether aspects of the PIER project itself created obstacles in identifying problems, and performing and documenting interventions. Specifically, pharmacists were asked about the cognitive service definitions, the documentation form, the training manual, and the newsletters. Table 4.15 summarizes the response frequencies for close-ended questions about perceived obstacles.

[2] The term "obstacles" has been used for pharmacist perceptions related to the project design.

Table 4.15 Response Distributions from Pharmacist Interview Questions about Perceived PIER Project Obstacles (n=187)

		Response Category Frequency (Percent) *				
Question	Missing	1	2	3	4	5
Q.2.1 Problem clarity	32 (17.1)	1 (0.5)	5 (2.7)	27 (14.4)	90 (48.1)	32 (17.1)
Q.2.3 Intervention clarity	37 (19.8)	1 (0.5)	3 (1.6)	20 (10.7)	81 (43.3)	45 (24.1)
Q.2.5 Result clarity	39 (20.8)	0	1 (0. 5)	24 (12.8)	79 (42.2)	44 (23.5)
Q.2.7 Form ease	47 (25.1)	36 (19.3)	46 (24.6)	37 (19.8)	15 (8.0)	6 (3.2)
Q.2.12 Training	97 (51.8)	0	2 (1.1)	18 (9.6)	39 (20.9)	31 (16.6)
Q.2.15 Manual	58 (31.0)	3 (1.6)	3 (1.6)	14 (7.5)	69 (36.9)	40 (21.4)
Q.2.16 Newsletter	34 (18.1)	33 (17.6)	29 (15.5)	53 (28.3)	22 (11.8)	16 (8.6)

* A five-point scale was used for all questions. The descriptive terms used in the scale differed depending on the question(s) asked. For Q 2.1, 2.3, and 2.5, the score of (1) represented very unclear and (5) very clear. In question 2.7, the score of (1) represented very easy and (5) very difficult. In question 2.12, the score of (1) was for completely inadequate and (5) very comprehensive. For Q2.15 and 2.16, the score of (1) represented no help or effect and (5) extremely helpful or motivating.

In questions 2.1, 2.3 and 2.5, pharmacists rated the clarity of problem, intervention and result definitions used in the pharmacist cognitive services elements. Pharmacists gave high ratings to the clarity of the definitions used. The percentages of pharmacists giving a "clear" (4) or "very clear" (5) rating for clarity of definitions was 65.2% (problems), 67.4% (interventions) and 65.7%(results).

The number of open-ended comments about problem, result or intervention definition clarity were small (31 responses). Most comments focussed on lack of problem definition clarity (19); however, only five comments made reference to specific problem definitions. Only three of the comments made reference to specific results and intervention definitions. Also, a concern was expressed about the APhA's *Standards of Practice* (APhA, 1996) being all encompassing, leaving few instances where pharmacist activities could be considered value-added services for reimbursement purposes. A sampling of pharmacist responses to the open-ended questions are included in Appendix I.

Q 2.7 asked about the ease of completing the documentation (intervention/claim) form. Forty-four percent of pharmacists gave a rating of "one" or "two" indicating the documentation form was easy to complete. A substantial number, 31 percent, experienced a degree of difficulty with the form giving a rating of "three", "four" or "five". A large number of open-ended responses were received about what made the completion of the forms easy or difficult (122 pharmacists responded). The number of comments about difficulties exceeded those about the ease of use. Forty-five comments attributed the ease of use to the simplicity of check marks, form conciseness, and form layout. The major difficulty reported was a lack of available time for documentation, identified in 38 comments. Twenty-eight comments were received from pharmacists who experienced difficulty in categorizing the problem, intervention and results. Appendix I provides a sample of pharmacists' responses.

A substantial proportion of pharmacists (64.2%) stated that an electronic submission process would improve the intervention/claims reporting. A large number of

comments or suggestions were made about improving the ease of documentation (133 pharmacists responded). The two most frequent suggestions were for electronic or computerized documentation and claims submission processes (54), and a system for flagging patients whose plan was paying for cognitive services (31). The need to have time freed from other demands was suggested by 17. A small number of pharmacists (17) indicated there was no need to change the documentation process utilized in the project. Appendix I provides a sample of pharmacists' comments.

Half the pharmacists who responded (50.6%) had attended one of the formal PIER training sessions. Pharmacists rated the training very highly; 77.7% of those attending gave it a (four) or (five) rating. A high proportion of pharmacists (93.6%) reported having access to the PIER training and reference manual. The proportion of pharmacists who reported reading the individual sections of the manual were "introduction", 81.1 %, "documentation requirements", 83.6%, "reimbursement details", 81.8%, and "case studies", section 82.8%.

Question 2.15 and 2.16 were about the usefulness of written materials used in the project. Pharmacists indicted that the PIER manual was very helpful in terms of helping to fill in claim forms. Fifty-eight responded with a four or five rating. A sample of pharmacists' comments about the manual is included in Appendix I.

Pharmacists' ratings of the effect or motivational impact of the project newsletter were quite variable. The percent of pharmacists who gave a "no effect" rating (one) was 17.6%, a "two" rating 15.5%, a "three" rating 28.3% and gave a "four" or "five" rating 20.4%. Appendix I lists some of the comments received about the newsletter.

Pharmacists were asked when they typically completed documentation. Although

only 25% of pharmacists actually sent in intervention/claim forms, over 70% responded to the question about timing of completion of PIER forms. The frequencies of the four categories were similar: immediately after the intervention (18.7%), at the end of shift (15.5%), at the first convenient break (10.7%), and other (15.5%).

A large number of pharmacists responded to the request to identify strengths and weaknesses of the PIER project structure (120 pharmacists responded). More pharmacists identified weaknesses than strengths. The most frequently mentioned weaknesses were as follows:

- Choice of ASEBP (identified by 48 pharmacists) - The ASEBP plan is small in size and its beneficiaries are younger and require fewer pharmaceutical care interventions in comparison to other programs (such as seniors). Because of the small numbers of prescriptions relative to other plans, pharmacists indicated the identification of clients was difficult.
- Excessive time commitment for documentation (identified by 24 pharmacists) - The manual intervention/claim form takes too long to complete and as a result was not done because of time pressures.

The most frequent strengths identified were as follows:

- Clarity and simplicity of documentation (identified by 14 pharmacists) - the format, layout and simplicity of use were identified.
- Need for evaluation projects (identified by 13 pharmacists)
- Pharmacists commented the project was a "good idea" and felt that the fact that the research was occurring was in itself a strength.

PIER Project Impact Assessment

In this section, pharmacist reports of the impact that the PIER reimbursement had on their practice are summarized. Table 4.16 lists the frequency distribution of pharmacist responses to close-ended questions.

Table 4.16 Response Distributions from Pharmacist Interview Questions about PIER Project Impact (n=187)

		Response Category Frequency (Percent) *				
Questions	Missing	1	2	3	4	5
Q.3.1 Awareness increased	8 (4.3)	27 (14.4)	75 (40.1)	62 (33.2)	15 (8.0)	-
Q.3.3 Influence on Interventions	36 (19.3)	92 (49.2)	37 (19.8)	16 (8.6)	6 (3.2)	-
Q.3.3.1 Influence to document	39 (20.9)	70 (37.4)	47 (25.1)	22 (11.8)	9 (4.8)	-
Q.3.8 Perform interventions	15 (8.0)	99 (52.9)	31 (16.6)	26 (13.9)	12 (6.4)	4 (2.1)
Q.3.9 Document interventions	19 (10.1)	66 (35.3)	29 (15.5)	27 (14.4)	33 (17.6)	13 (7.0)
Q.3.10 Spend longer time	19 (10.1)	85 (45.5)	35 (18.7)	30 (16.0)	14 (7.5)	4 (2.1)
Q.3.11 Look for certain problems	17 (9.1)	71 (38.0)	29 (15.5)	45 (24.1)	18 (9.6)	7 (3.7)
Q.3.12 Change behaviour	18 (9.6)	91 (48.7)	44 (23.5)	20 (10.7)	12 (6.4)	2 (1.1)
Q.3.6 Salary linkage	32 (17.1)	43 (23.0)	45 (24.1)	42 (22.5)	25 (13.4)	-
Q.3.7 Increased pharmacist portion	26 (13.9)	61 (32.6)	42 (22.5)	33 (17.6)	25 (13.3)	-
Q.3.13 Increased equitability	18 (9.7)	15 (8.0)	23 (12.3)	47 (25.1)	56 (29.9)	28 (15.0)

* Four or five-point scales were used for this series of questions. The four-point scale was used to limit the number of choices for a few questions. For questions 3.1, 3.3, 3.3.1, 3.6 and 3.7 the four-point scale was used where the scores of (1) represented not at all and (4) a large amount. For the remaining questions, Q 3.8, 3.9, 3.10, 3.11, 3.12 and 3.13 a five-point scale was used where the scores of (1) represented not at all and (5) represented completely.

Questions 3.1, 3.3 and 3.3.1 asked if project participation and group assignments had an impact on awareness of alternative reimbursement and performing and documenting interventions. Pharmacists reported that project participation had some impact on awareness of alternative reimbursement strategies; 81.3% of responses were "small amount", "significant amount" or "large amount". Forty percent gave the rating "small amount", indicating the effect was small. Generally, pharmacists indicated that pay group assignments had a minimal impact on performing and documenting interventions. Over 49% of pharmacists indicated that their assignment to a reimbursement group had no effect on performing interventions. Pay group assignment influenced documentation to a slightly greater extent; with 37% of pharmacists indicating "no effect".

When pharmacists were asked to identify which reimbursement group they were in, nearly half (48.7%) did not know or provided no answer. Of those who indicated that they did know their payment group, the highest frequency was Group A (20.3%), followed by Group C (17.6%) and then Group B (13.4%). When asked if participation would have been altered had they been assigned to a different payment group, 55.6% indicated "no", 15% "yes" and 29.5% did not know or gave no answer.

Questions 3.8, 3.9, 3.10, 3.11 and 3.12 determined the general influence of the project on performing interventions, documentation, time spent, problem detection and changed behaviour. Pharmacists responded indicating some influence (rating of 2) as follows: documentation, 54.5%; problems, 52.9%; time, 44.3%; behaviour, 41.7%; and interventions, 39%.

One hundred seventy-seven separate open-ended comments were provided for

questions 3.8 to 3.12. Two major themes were expressed in the comments. The strongest theme (82 responses) was that payment does not have an effect on the areas of practice identified because the changes identified were considered a function of expected job and practice responsibilities. The second common theme was that the project had an effect on awareness because it provided a documentation model that many pharmacists were lacking (41 responses). Seventeen pharmacists reported that they were influenced by the payment model to look for certain types of problems. A sample of pharmacists' open-ended comments from this section is included in Appendix I.

Questions 3.6 and 3.7 asked about the potential impact of modifications to the PIER reimbursement system. Sixty percent of respondents indicated that linking salary merit pay increments to the number of interventions documented would cause them to complete more PIER forms. Over half the pharmacists (53.4%) indicated that, if a greater share were paid directly to the pharmacist, documentation rates would increase. Fifty-one pharmacists who responded affirmatively to the previous question were asked how much reimbursement would "make it worth your while" to complete more PIER claim forms. The mean value reported was $8.51 (+/- 12.60).

In the final question 3.13, pharmacists responded strongly that the new reimbursement scheme was more equitable than the current model with 82.3% giving a rating of "two" or more.

Seventy-three pharmacists provided open-ended comments about the PIER reimbursement model. The majority of the comments supported the model (38 supportive/13 non-supportive comments). A number of positive comments recognized that the model was only a first step. Pharmacists indicated that more extensive

application of this model and the development of more complex models were required. In the non-supportive comments, two common themes were expressed: consultative services were part of the job and should not be reimbursed separately; and there were too few interventions to base a reimbursement approach on interventions.

One hundred pharmacists provided comments in response to the open-ended question "What general comments do you have to make about the impact the PIER project had on your practice?" A sampling of pharmacists' open-ended responses is included in Appendix I. Two major themes emerged from the responses: PIER increased awareness about the need to document for reimbursement, but had little or no impact on practice.

Understanding of the PIER Project

Each pharmacist was asked to explain the PIER project's goals. The majority of pharmacists (172) provided a response to this question. The most common goal identified was to document the value of pharmacists' cognitive services to plan sponsors. Seventy-nine (45.9%) pharmacist comments stated this goal using the same or similar words, including "document, make aware, record, provide evidence, establish value, show, prove and illustrate". Another goal identified was to evaluate alternative reimbursement from a pharmacy financial perspective. Twenty-nine (16.9%) pharmacists identified this goal using words such as "feasibility, viability, monetary benefits, justified, and fair". A third common goal identified by 26 (15.1%) pharmacists was to evaluate the effect of alternative reimbursement on pharmacy practice.

A specific topic, the concept of value-added services, was selected to evaluate

pharmacists' understanding of this major design element of the project. The responses from pharmacists are shown below in Table 4.17.

Table 4.17 Pharmacist Categorization of Practice Scenarios as "Value Added"

	Scenario	Responding as value added (%)	Responding as not value added (%)	Other or missing (%)
1	QID Arthrotec/TID dose regimen recommended/pharmacist call physician to change order	67.9	27.3	4.8
2	Patient requests refill/current Rx has no refills/ pharmacist calls physician for refill authorization	40.6	54	5.3
3	Young patient receives inhaler and aerochamber/pharmacist devotes 10 minutes on training patient to use inhaler	81.3	21.9	6.9
4	Pharmacist counsels patient on correct use of tetracycline for acute infection	43.9	51.3	4.8
5	Prescription for drug not on DBL/alternate drug identified/physician contacted for new prescription.	71.1	21.9	5.3

Pharmacists showed the greatest variation in their responses to the second and fourth scenarios. These two scenarios were examples of services not considered value-added as defined in the project orientation and written materials.

In summary, the results from the interviews showed that 50% of the PIER pharmacists were not aware of which reimbursement group they belonged to and only 25% of the respondents actually submitted a claim form. Interview results suggested that the project structure did not pose a major obstacle to documentation of services. A lack of time to complete documentation and difficulty identifying clients were the most significant obstacles. Pharmacists rated the impact of the project on five specific practice areas in the following descending order: documented more interventions, looked for

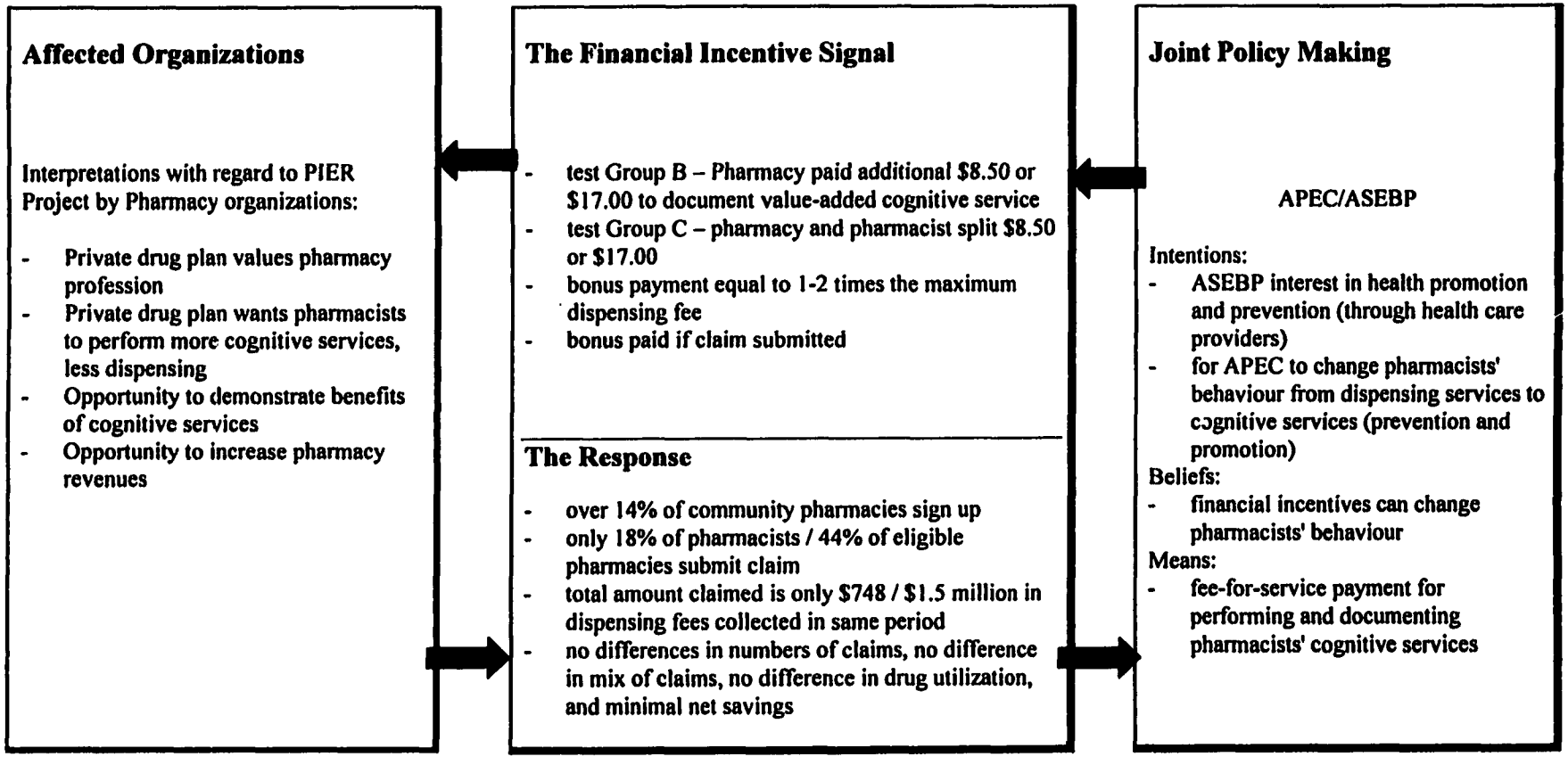
certain problems, spent more time on interventions, changed behaviour from dispensing to consultative, and performed more interventions. Pharmacists indicated that other types of new reimbursement models, possibly linking salary payments more directly to the provision of cognitive services, should be examined. Pharmacists showed a disparate understanding of the definition of value-added services.

Case Study

The case study was used to put the PIER project in a broader context by examining the responses of various stakeholders to the PIER reimbursement system. The case study used the communications model framework developed by the Centre for Health Economics and Policy (Giacomini et al., 1996a). The main components of the communications model are the policy-making process (intentions, beliefs and means), the financial incentive signal, the interpretations of affected organizations, and the response to the signal. Figure 4.1 applies the communication model to the PIER project.

Some changes were necessary in interpreting the PIER project in the context of the communications model. The communications model was developed for public sector financial policies; the PIER project was in the private sector and was only a pilot project. In addition, there was a finite project duration and pharmacy and pharmacist participation was optional. Had all pharmacies in the province been required to participate on a long-term basis, it is anticipated that some of the interpretations and responses might have been different.

Figure 4.2 Financial Incentives as a Communication Process - PIER Project



How the PIER Project Evolved

The Alberta Pharmacy Economics Committee (APEC) is an arms-length committee of the Alberta Pharmaceutical Association (APhA) that represents the interests of pharmacy owners, managers, and pharmacists. Its goal is to maintain economic stability primarily for community (retail) pharmacies through economic negotiations with third party payers and related advocacy activities. APEC was concerned about the trend for third party payers to arbitrarily decrease or limit pharmacy dispensing fees. In 1994, a Director of Pharmacy Economics was hired and given a mandate to develop and evaluate new pharmacy payment systems for potential implementation in Alberta.

An opportunity for joint policy making occurred. The ASEBP had revised their strategic plan to devote more attention to health promotion and disease prevention activities for their beneficiaries. One approach for fulfilling this plan was to engage health care providers such as pharmacists to carry out these activities. At the same time, APEC was interested in changing pharmacists' behaviour from dispensing to also providing cognitive services. APEC and ASEBP shared the belief that pharmacists had not changed their practice behaviour because they were not reimbursed for performing cognitive services (including health promotion and prevention activities). A new pharmacy cognitive service payment model was suggested as the means for changing behaviour.

A major review of payment systems employed in community pharmacy occurred in the fall of 1994. After reviewing four payment systems, a group of Alberta pharmacy opinion leaders chose the Washington State CARE model as the basis for the Alberta system. The Washington pay system was modified for use in Alberta. Appendix J

provides a complete description of how the PIER reimbursement model was selected and the payment schedule modified.

The PIER project immediately followed a reduction of the pharmacy dispensing fee by ASEBP. APEC proposed the PIER research project to ASEBP in the aftermath of the reduction. APEC viewed PIER as an opportunity to field-test a potential reimbursement system for pharmacist cognitive services that could be implemented on a plan or even provincial basis. Many pharmacists and pharmacy organizations viewed the project optimistically because a private payer was willing to work with pharmacy to evaluate the new payment approach. The economics arm of the pharmacy association and the payer agreed to conduct the project. The costs for the project were shared by APEC and ASEBP, with ASEBP agreeing to pay for cognitive services. The Economics Committee believed that the additional financial incentives offered by PIER would change pharmacists' behaviour: pharmacists would perform more cognitive services and subsequently affect client outcomes. Also, APEC and ASEBP believed that the effect of the payment system could be measured.

APEC led the development and testing of the new reimbursement model. PIER represented an opportunity to link professional and economic interests. The PIER model was developed through APEC and accepted by ASEBP, a province-wide private drug benefit plan, for evaluation. There have been few opportunities in the past for pharmacy to consider both professional and business interests in the development of future payment policies. Also, opportunities to work in partnership with a drug plan on a payment system are rare. In most drug plans, strategic decisions are made about pharmacy payments using a "top down" approach, with minimal consultation; decisions are usually developed in

response to budgetary overruns (Soumerai, Ross-Degnan, Fortess, and Walser, 1997). The PIER project incorporated joint policy-making, extensive consultation within pharmacy, and was not introduced as a measure with the single intent of reducing drug budgets.

The PIER Financial Signal

The PIER financial "signal" can be described in terms of the system for classifying pharmacist cognitive services and the weighted fee schedule. The classification and fee schedules provide information on the behaviour desired (or what is paid for), and the terms of exchange (or how paid).

The behaviour intended was an increased performance and documentation of value-added cognitive services. Value-added services were defined as a cognitive service from a pharmacist over and above those included in the current dispensing fee. The value-added concept was described in the pharmacists' orientation and in the reference manual.

The components of the classification system are described in Chapter III – (Methodology) and the detailed cognitive service definitions are shown in Appendix F. The PIER fee schedule is shown in Appendix J and detailed examples of billing determinations are shown in Appendix K.

The terms of exchange were simple. Upon receipt of documentation, and following a review of the claim data for completeness and correctness, payments were made on a quarterly basis to the pharmacy manager. The target for payment was the pharmacy (Group B), or pharmacies and pharmacists in the case of Group C. In the

sharing option, the pharmacy manager was responsible for providing pharmacists with their share. There was no financial risk to pharmacies or pharmacists for non-participation.

Interpretation and Response to PIER

The PIER project was viewed positively by pharmacy organizations in Alberta, including most independently owned pharmacies and chain drug store organizations. Prior to PIER, pharmacists were not pleased with ASEBP's unilateral dispensing fee reduction. ASEBP was criticized for not recognizing the value of pharmacists' professional services. The project coordinator noticed a change in the attitudes of a number of pharmacists when ASEBP agreed to partner with APEC in the PIER project. Pharmacists were surprised that ASEBP would consider the project and pay pharmacy cognitive service fees. The new payment model recognized pharmacists' concerns about a lack of recognition of the value of the pharmacist and the lack of payment for cognitive services. The Economics Committee viewed the PIER project as an opportunity to test a new payment system. Most pharmacists understood that the PIER project was a first step towards a new payment system. A small number of pharmacists indicated that more sophisticated payment models should be included in the evaluation; for example, capitation payments for disease management or more complex fee-for-service payment models.

External stakeholders such as other pharmacy organizations (Canadian Pharmacists Association, provincial pharmacy associations), research groups (Canadian Pharmacy Practice Research Group) and the pharmaceutical industry continually

monitored the progress. Presentations were made at national and provincial educational programs, and national research meetings. Information was provided to drug industry representatives about the project. Articles appeared about the project in pharmacy newsletters and publications, and in drug industry newsletters.

Over 70% of eligible phase 1 pharmacists attended an orientation session. General interest appeared keen during the sessions. After the study launch, pharmacists contacted the project coordinator with thoughts and suggestions about continued low claim submission rates. Over the course of the study, small numbers of study pharmacists expressed to the project coordinator occasional dissatisfaction with the continued high profile placed on new reimbursement models for cognitive services. Pharmacists argued that drug distribution was the "bread and butter" of most pharmacy practice and that equal or greater attention should be placed on the distribution side of practice.

The findings from the experiment and survey showed that the financial incentives had no effect on pharmacy practice, drug utilization, and costs. Most pharmacy stakeholders hoped for and expected results supporting the use of the PIER reimbursement system. Pharmacists appeared adequately prepared for the project but were either unable or unwilling to complete documentation and submit claims.

The level of interest shown by pharmacy business stakeholders such as pharmacy owners, managers, and corporations was minimal. Compared to other issues addressed by APEC such as provincial government negotiations, the number of contacts from pharmacy business stakeholders about the PIER project was low. Routine discussions occurred between the project coordinator and three major pharmacy corporations. Two

corporate managers, from pharmacy chain store organizations, followed the progress of the project in their respective participating pharmacies and discussed the progress and individual performance with their store managers at management meetings and during pharmacy visits. Three major corporate offices did not permit any of their pharmacies to participate in the study.

Approximately 15 individual study participants contacted the project coordinator routinely to inquire about the progress of the study. No organizations indicated they were making any changes to their operating systems or policies to enhance performance in the project. The Economics Committee routinely discussed the status and progress of the project at business meetings.

The project's total budget for cognitive service fees was $19,125 while the amount claimed by eligible pharmacies was $748. Over the study period, PIER project pharmacies collected approximately $1.5 million in dispensing fees.

In summary, this case study interpreted the response to the funding change from a broad perspective. The connections between the policy-making, the financial incentive signal, the interpretations and responses were weak. The policy-making process was controlled by pharmacy and the financial incentive signal was believed to be clear and simple. The interpretation was expected to be clear and the response was anticipated to be definitive. Results of the case study point to unintended responses.

CHAPTER V

DISCUSSION OF RESULTS

The purpose of the research was to examine whether cognitive services, drug utilization and costs were affected by a new pharmacy reimbursement model. The research examined pharmacists' perceptions about the reimbursement model, and explained how the reimbursement model worked within the context of a communication model.

The discussion chapter is organized according to the three components of the research: the experiment, the pharmacist survey and the case study. The limitations of the research are discussed at the end of the chapter.

Experiment

The hypotheses addressed in the experiment were as follows.

Hypothesis 1 – There will be no difference between control and test groups (receiving payment for cognitive services); (a) in the frequency of cognitive services provided, and (b) in the mix of cognitive services provided.

Hypothesis 2 – For the cognitive services provided, there will be no difference between control and test groups; (a) in the number of drugs ordered compared to the number dispensed, and (b) in the mix of drugs ordered compared to the mix dispensed.

Hypothesis 3 – For the cognitive services provided, there will be no difference between control and test groups in the net cost (drug cost savings minus cognitive service payments).

The results are discussed in four sub-sections. First, the low documentation rate is discussed. Then, the results pertaining to the three hypotheses are discussed in the sub sections: cognitive services, drug utilization and economic impact.

Low Documentation Rate

The March 1996 procedural change requesting that pharmacists submit all claims and removing limit of two claims per patient per month did not affect the numbers of claims received each month. The average number of claims received over the three months following the change (April - June 1996) was 7.3 claims per month for all pharmacies. The combination of the change in adjudicator and the reduced orientation program for phase II pharmacists appeared to affect the amount of documentation. The change in adjudicator and enrollment of the new pharmacists occurred simultaneously on July 1, 1996. The average number of claims per month decreased from over 9 per month in phase I to 6 per month in phase II. Based on the phase I experience (82 claims) and with the added sample (number of pharmacies increased by 50%), the total additional claims projected for phase II was 123 (82 + 41). The expected average monthly claims would have been 13.7; however, this was not attained. The modified orientation did not appear to have a major effect. The phase I pharmacist sample size was two times the pharmacies added in the phase II sample, and the phase I sample submitted two times the average number of claims per month. It is likely the change in adjudicator had a greater impact than the reduced orientation. The effect of the two factors was to reduce pharmacists' documentation by more than 50% in phase II.

The low number of claims submitted by pharmacists not only had a major impact

on the results but was in itself a significant finding. The overall documentation rate of 0.07 per 100 prescriptions (0.07%) was unexpectedly low, significantly lower than the intervention rates of 0.7% to 4.5% reported in the previously cited Canadian and US community pharmacy studies. The documentation rate is similar to that seen in 1994-95 in the Quebec Pharmaceutical Opinion program (Gariepy, 1997). The PIER documentation rate was 10 to 60-fold lower than that in other research projects. Two possible explanations for the low documentation rate are an atypical population, and the lack of an automated documentation and billing system.

First, compared to major drug plans (e.g., seniors, social welfare) the ASEBP population was atypical in terms of relative size and the incidence of drug-related problems among its clients. This had a major effect on the overall PIER documentation rate. In most pharmacies, ASEBP clients accounted for a comparatively small proportion of pharmacy clientele; the annual ASEBP prescription volume was about 2% of the total for the province. Pharmacists reported difficulty in identifying ASEBP clients from their much larger client base and in completing the documentation for this group. In the Iowa study, Cirn (1980) found that pharmacists experienced client identification problems because of inaccurate and outdated eligibility lists. Identification was considered a major problem in the Iowa project. Christensen and Holmes (1996) found higher pharmacy documentation rates were associated with a greater percentage of prescriptions billed to Washington Medicaid (the plan paying for documented cognitive services). PIER pharmacists reported in interviews that the ASEBP beneficiaries were a group that did not require as many cognitive services compared to other populations such as seniors and social assistance recipients. Data from the Saskatchewan Prescription Drug Plan shows

that seniors receive on average three times as many prescriptions as non-senior drug plan beneficiaries (Quinn, Baker, and Evans, 1992). In addition, information from the Alberta Blue Cross Pride Real Time network shows that the frequency of drug-drug interaction messages sent to pharmacists is much higher for social assistance recipients and for seniors than for private plan beneficiaries. The drug-drug interaction message rate for Alberta government plans is 10% while the rate for Blue Cross private plans is 2% (D. Balon-Anderson, personal communication, 1998). ASEBP is a private sector drug benefit plan and would be expected to have a lower frequency of drug-drug interaction messages compared to government sponsored drug plans due to the age of the respondents.

Second, the PIER project used a manual documentation and claim submission process for cognitive service billings. The importance of an automated billing system at both the provincial level and at the pharmacy level is evident from other research. Poirier and Gariepy (1996) reported that an automated provincial billing system for the Pharmaceutical Opinion program was responsible for the 50 – 150 fold increase in billing documentation. Although almost all pharmacies are computerized, the technology to support the pharmacist in providing and documenting cognitive services is neither available nor used. One report (Banahan, Bentley, and McCaffrey; 1995) indicated that 56% of retail pharmacists have computer systems that can perform documentation on interventions but only 19% of the systems support billing for interventions. Only 25% of pharmacies with systems used them for documenting interventions. Recently, the availability of comprehensive pharmacy computer systems has improved, giving pharmacists' greater support technology, which prompt pharmacists about intervention opportunities, provide the pharmacist with reference materials, document professional

services and payment amounts, and collate the information for management review.

Effects on Cognitive Services Frequency/Mix

Hypothesis 1 stated there would be no difference in the frequency and mix of cognitive services when reimbursement occurred for these services. The payment incentive had no effect on the frequency of cognitive service claims and the mix of cognitive services. This result is different from the results found in other similar studies.

The PIER reimbursement did not appear to be strong enough to create an incentive for pharmacists to provide cognitive services. In other studies (Washington and Arkansas), very similar reimbursement models and project designs produced different effects with lower reimbursement amounts. There are a few potential explanations for the differences.

First, differences in the actual reimbursement models did not appear to explain the different results. The actual reimbursement models used in the PIER project, the Washington project and Arkansas project were very similar. The only major variations were the PIER project split payments to pharmacists and pharmacies, and the Washington and Arkansas project payments to the pharmacies of a participation fee. The list of eligible cognitive services was very similar, as were the documentation and claim procedures. Compared to Washington and Arkansas, the PIER level of payment was higher.

Second, there was at least one major difference in research design between the PIER and Washington projects. The method of assigning pharmacies to payment groups differed. In PIER, pharmacies were randomly assigned to payment groups while in the

Washington study, pharmacies were clustered prior to assignment. The different methods of assignment may have contributed to the different results; however, this is difficult to prove without analyzing the actual data from both studies in some detail.

Third, a potential explanation for the difference is the difference in pharmacy practice between the US and Canada, however, this explanation is unlikely as Canadian and US studies have shown very similar community pharmacist intervention rates.

Fourth, a more likely explanation for the results was the major difference in the characteristics of drug benefit populations. Both the size and type of population eligible for cognitive services was important. The PIER (ASEBP) population received 2% of prescriptions in the province and was made up of a professional occupational group (teachers and their dependents). The Washington Medicaid population (elderly and children) accounted for up to 19% of the state prescription payments and the population had a likelihood of a high risk of drug-related problems (Christensen and Holmes, 1996). In Arkansas, it appears that all drug plan beneficiaries (100% of prescriptions) were eligible for cognitive services (McCormack et al., 1996). Because of the differences in relative population size differences and the incidence of drug-related problems, the opportunity to detect and document drug-related problems was significantly higher in the Washington and Arkansas projects compared to the PIER project.

The differences in the mix of cognitive services in PIER and Washington can be attributed to the difference in population characteristics in the two projects. The PIER population was a broader age mix with a likelihood of fewer drug-related problems whereas the Washington population consisted of two high-risk age groups with a likelihood of more drug-related problems. Both populations included children. A

broader mix of problem categories was seen in the PIER project. The top two problem categories in PIER accounted for 33% of those reported, while the top two problem categories in the Washington study accounted for 52% of those reported. In the PIER project eight problem categories accounted for 75% of those reported while in the Washington study five problem categories, accounted for 75% of those reported. In the PIER project, only 18.4% of problems were classified as patient specific while in the Washington study 49.8% were patient specific.

Effects on Drug Utilization

Hypothesis 2 stated when cognitive services were provided, there would be no differences between control and test groups in the number of prescriptions and the mix of drugs used (comparing what was ordered to what was dispensed). Since the PIER reimbursement did not result in more cognitive services, it was reasonable that there were no significant differences in the tests for hypothesis 2.

There is one important result from the drug utilization review requiring discussion. The characteristics of drug classes involved were related to the characteristics of the population covered by the drug plan. When aggregate drug utilization findings from the PIER project are compared to the Washington project, the effect of characteristics of the patient population can be illustrated. The therapeutic classes involved in PIER claims were narrow. The anti-infective drug class accounted for one-third of cognitive service claims and, in combination with the central nervous system class, accounted for half of the claims. In the Washington study, the mix was very broad with ten classes accounting for only 32.9% of the claims. Anticonvulsants,

antipsychotics, and antidepressants accounted for 17.1% of the claims. This finding may be of use in the design of future reimbursement models. For example, in drug benefit populations similar to ASEBP, financial incentives could be limited to focus only on specific drug groups with a higher potential for drug-related problems.

Economic Impact of PIER Payment Model

Hypothesis 3 stated that there would be no difference between control and test groups' drug cost avoidance. Statistical testing indicated there was a significant difference among the three groups. The direction of the difference was in favor of the control group. Hypothesis 3 was rejected. This result was consistent given that there were no significant differences in cognitive services or drug utilization.

The result is important for planning future reimbursement models. The result suggests that additional pharmacy payments (for cognitive services) are unlikely to be justified solely on drug cost savings or drug cost avoidance.

The total payment made to PIER pharmacies and pharmacists and resulting drug plan savings was small. The total cognitive service payment to Groups B and C was barely offset by drug cost savings (net saving was $266.5 – 196.5 = $70), while the control group produced $260 in savings without cognitive services payments. If administration and processing costs are considered, it is likely that the PIER program would cost more than it would save. The average overall PIER drug cost saving of $7.93 per claim ($1078 / 136 claims) is similar to that found in research evaluating pharmacist interventions (e.g., Community Pharmacist Intervention Study estimated a drug cost savings of $5.90 per intervention).

In a general sense, for cognitive service payments to be cost effective, savings would result from decreased health care resource utilization (hospital and physician resource consumption), decreased drug use, overtime, and increased worker productivity. More elaborate economic models have been used to estimate the economic impact of pharmacist interventions. Rupp (1992) estimated savings of $122.98 per pharmacist intervention. The estimate included the direct cost of medical care avoided (defined as the costs of emergency care, hospitalization, physician office visits and self-care). The Community Pharmacist Intervention Study determined savings of $16.74 per pharmacist intervention. This was calculated by determining direct drug cost savings and savings from an estimated reduction in physician visits. The prescription cost saving, including reduced pharmacy dispensing fees, was $9.74 and the physician fee savings was $7. The drug cost saving identified in the Washington CARE project was $14.64 per cognitive service (resulting in a drug therapy change). However, drug savings were calculated both for the immediate impact and projected downstream reduction in prescription refills over a one-year period. No published reports could be found where the economic impact of pharmacy interventions on worker productivity has been calculated, in part because the assessment and measurement of productivity is controversial and requires further development (Peeples, Wertheimer, Mackowiak, and McGhan, 1997a and b).

In summary, two of the experimental hypotheses were not rejected and one was rejected. Overall, the experiment yielded little documentation. Cognitive service claim frequency and mix was not affected by the PIER reimbursement model. Accordingly, the PIER reimbursement model did not produce changes in drug utilization (prescription numbers and mix of drugs) and resulted in a minimal net saving (pharmacy payments

minus drug costs). The unique characteristics of ASEBP patient population (small relative size and low incidence of drug-related problems) were the most likely explanation for the experimental results.

Pharmacist Survey

The following three general research questions were addressed through the interviews.

(1) Does the project design (e.g., training and reference materials) or the new reimbursement system (e.g., the documentation form) create perceived obstacles to the pharmacist in providing cognitive services?

(2) Does the new reimbursement model affect specific practice activities (e.g., performing more interventions, documenting more interventions, spending longer time on interventions, looking for certain drug-related problems, and changing behaviour from dispensing to non-dispensing)?

(3) To what extent do pharmacists share a common understanding of the concept of value-added services as the basis for cognitive services reimbursement?

Perceived Obstacles to Pharmacists

The main perceived obstacles were important because they helped to explain the low overall documentation rate and are also important in guiding future research. The obstacles were attributable to both the PIER project design and to factors external to the project design.

The first perceived obstacle was an inadequate pharmacy work environment. It impeded pharmacists in documenting cognitive services. In responses to open-ended

questions, many pharmacists reported that they found the manual PIER form simple and easy to understand but that they had no time to complete it. "Too much paperwork" and a "lack of time" have been reported as major documentation obstacles in other research (Dumas, 1994; Christensen and Holmes, 1996). Rupp, DeYoung and Shondelmeyer (1992) demonstrated that the number of interventions performed by pharmacists is a function of the level of dispensing activity. Janke and MacLeod-Richards (1997) have identified two methods for assisting with time issues: delegating tasks and maximizing the efficiency of dispensary activities. Changes in these two areas are critical to helping pharmacists free up time to perform, document, and claim for cognitive services.

The PIER documentation form was selected over others because it was identified as the simplest and most concise. Pharmacists reported a mean time of 9.2 minutes to perform and document interventions. Some portion of the 9.2 minutes was required for documentation. It is a key issue in this project that pharmacists could not find the time to document an intervention they performed. It is not clear how much this is system-related and/or attitudinal. Poirier and Gariepy (1996) reported that the implementation of an automated billing system in combination with other changes, such as new definitions for cognitive service and pharmacy risk sharing, increased the number of pharmaceutical opinion and refusal to dispense claims 15-fold. Berger and Grimley (1997) found that pharmacists were more prepared or motivated to perform a patient assessment or patient follow-up than to document the care provided and to submit a claim for compensation.

Another obstacle identified was the lack of computerized pharmacy support systems for documentation of cognitive services and identifying eligible clients. Most PIER pharmacists reported that electronic documentation would make it easier to

complete documentation.

Pharmacists reported that the small ASEBP population was an obstacle. Alberta Blue Cross adjudicates 50 to 60% of all prescriptions in Alberta. ASEBP prescriptions accounted for only 2 to 3% of Blue Cross business which made up a small part of the prescription business in most of the participating pharmacies (a maximum of 2% of total prescriptions). The adjudication and pharmacy software systems were not able to flag specific client groups. Recognition of ASEBP clients was dependent on the individual pharmacist's knowledge about his or her patients. Pharmacists reported that in many instances they were unable to recognize ASEBP beneficiaries. If they did recognize them and performed a cognitive service, they did not usually submit a documented claim.

Research on new reimbursement programs should be designed to minimize obstacles. For example, the preferred setting for future research should be in large drug plans. Pharmacy inclusion criteria might consider only pharmacies with appropriate work environments, and pharmacies with adequate internal systems for documentation and client identification. Attention should be paid to approaches designed to increase and sustain pharmacist awareness and interest.

Perceived Effect on Practice

The results from the assessment of pharmacists' perceptions of the effects of the reimbursement model are important because they help to explain both the low response rate and the lack of effect in the experiment. First, the impact was likely reduced because a large number of pharmacists lacked specific knowledge about the operation of the reimbursement model. Only half the pharmacists knew which reimbursement group

they belonged to after significant orientation and communication efforts. On several questions in the survey, pharmacists indicated they could not respond because they were not familiar enough with the PIER project. Study group allocation was available from several sources: the assignment letters sent to the pharmacy, the pharmacy manager, each pharmacy's designated contact person, and through direct access to the project coordinator. It was not clear whether this was due to poor communications between the project coordinator and the pharmacies and/or within the pharmacies. Some possible contributory explanations were that only 50% of the eligible pharmacists attended the orientation and there was a 15% rate of turnover of pharmacists.

Second, it is possible that a sizeable number of pharmacists had neither the interest nor the intention of documenting and submitting a claim for payment. In the open-ended commentary, approximately one-quarter of the pharmacists indicated that interventions were done regardless of payment. Berger and Grimley's survey (1997) found that only 8% of pharmacists are ready to document care and only 3% ready to submit claims for reimbursement. Cirn (1980) found that Iowa pharmacists (both owners and managers) were evenly divided in their level of understanding about the capitation funding model, and comprehension and motivation among salaried pharmacists was deficient.

Third, the perceived effect of reimbursement on practice behaviour was very weak. Responses were skewed in the direction of reimbursement having no perceived effect. In the responses to the questions (Q3.8 – 3.12) about the impact of the PIER payment model, the most frequent individual response was "not at all" (35 – 52%), while the least frequent individual response was in the categories "large amount" or

"thoroughly" (1-7%). Reimbursement had the least perceived effect on performing interventions and changing behaviour. Although the response was still weak, the greatest perceived effect of reimbursement was on documenting interventions and looking for certain problems. This suggests that other factors are more important to pharmacists than reimbursement for changing practice. Large numbers of PIER pharmacists suggested that interventions were dictated by the duties and responsibilities in the standards of practice (i.e., regulation rather than by payment). Other research findings are similar. Grootendorst et al., 1996 suggested that professional considerations may have been a factor in inhibiting generic substitution under PIP. Professional obligation to the patient may have a stronger effect that financial incentives. Raisch (1993) found that financial payments ranked sixth out of eight barriers perceived important by pharmacists in counselling patients and for interacting with physicians. Barriers found to be most important by Raisch were excessive workloads in counselling and difficulties making contact with physicians.

In an explanatory model of physician behaviour Tamblyn and Battista (1993) grouped factors affecting clinical practice. Predisposing factors (affecting practice behaviour) were practitioners' knowledge and skills and socio-demographic characteristics (e.g. age). New behaviour was initiated by enabling factors and sustained by reinforcing factors. In the physician model, the enabling factor was practice setting, and the reinforcing factors were patient population and reimbursement policy. Currently, a similar model is not available for explaining pharmacists' practice behaviour. Raisch's (1993) model does not group these factors in the same manner as the physician model.

The PIER results suggest that some aspects of Tamblyn and Battista's model may

apply to pharmacists. Work environment and support systems were identified as strong barriers. These are important characteristics of the pharmacy practice setting. The different results seen when comparing PIER to other research suggest that characteristics of the population served, such as size, was important. Both practice setting and patient population are possible enabling factors in a pharmacist's behaviour model. The lack of response to the PIER incentive may suggest that reimbursement policy is a reinforcing factor in pharmacists' behaviour. It is likely that changing the behaviour of pharmacists should be approached by modifying combinations of factors. Change may be induced by modifying the enabling factors and sustained (reinforced) through financial incentives. There is a need for research to suggest a better explanatory model of changing pharmacist behaviour.

Although pharmacists supported the PIER reimbursement model over the current bundled payment system, they expressed interest in other payment system changes as well. Pharmacists expressed high levels of interest in salary incentives and increased fee-for-service pharmacist payments. It makes intuitive sense for pharmacy and pharmacist payment systems to be aligned so that both the pharmacy and pharmacist are exposed to similar financial risks and benefits. Pharmacists' willingness to consider new salary payment systems is a positive sign for reform. In terms of future research, new salary strategies could be evaluated at the level of the individual pharmacy or at a corporate pharmacy level without the involvement of third party payers.

Understanding of Value-added Concept

Pharmacists demonstrated some variation in understanding of the value-added

service concept (Table 4.17). Five scenarios demonstrating value-added and non value-added interventions were presented to pharmacists. In three of the test scenarios; changing a dosage regimen, extensive patient counselling, and a change in a drug because of plan coverage, at least two-thirds of the pharmacists correctly identified the scenarios incorporating value-added scenarios. The two others, a routine refill authorization and routine counselling, were included to illustrate non value-added services. Over half of these pharmacists classified these scenarios as value-added. In the experiment, this would likely result in a substantial over-reporting of non value-added pharmacist interventions. Feedback from pharmacists over the first five months of the experiment suggested that the low documentation rate was related to pharmacists' uncertainty about classifying cognitive services as value-added. The interview responses suggest that any uncertainty would be translated into over documentation; however, this did not happen in the experiment.

In summary, the PIER reimbursement system and the project design (e.g., paper documentation process and a lack of a client identification system) highlighted the importance of key obstacles facing pharmacists in the provision of cognitive services (time and system barriers). These obstacles are not new and have been identified in other research. This finding suggests that the time and system obstacles are stronger than changes in reimbursement in influencing pharmacists' practice behaviour. The perceived effect of the PIER reimbursement model on pharmacists' practice activities was very low and large numbers of pharmacists lacked knowledge about the model. Early in the study, pharmacists indicated that confusion about value-added concept was a reason for the low documentation in the project. Although, pharmacists' understanding of the value-added

concept appeared to vary, this variation did not appear to be a reason for the low amounts of documentation received.

Case Study

Two main research questions were addressed in the case study.

(1) What policy making process produced the new financial incentive and what were the features of the incentive?

(2) How do affected organizations interpret this financial incentive and respond in ways that might give insight into its "incentive" properties?

The underlying premise for PIER policy was that pharmacists could be motivated to change their behaviour through appropriate financial incentives. The assumption used was that the extrinsic motivator (payment for cognitive services) was sufficient to change behaviour. Other extrinsic motivators such as pharmacy corporate culture were ignored, as were intrinsic motivational factors such as professional norms, pharmacist job satisfaction, self-efficacy, etc. The limitations of this assumption were seen in the results of the experiment and interviews. For example, the importance of corporate culture could be seen in difficulties encountered in recruiting a sufficient number of pharmacies for the experiment, and in difficulties directly paying pharmacists in corporate settings. In the interviews (open-ended comments for Q3.8 - 3.12), the importance of professional norms were seen by pharmacists as being more important than reimbursement in influencing practice behaviour. It appears that pharmacists' practice behaviour cannot be changed primarily through a change in reimbursement program.

The behaviour rewarded (what was paid for) in the PIER project was clearly defined in the PIER cognitive service definitions and confirmed by pharmacists in survey

responses (Q2.1, 2.3, 2.5). The target (who is paid) for the PIER reimbursement model was the pharmacy for group B and both the pharmacy and pharmacist for group C. In Group C the pharmacy (an organization) was the primary target and the pharmacist (an individual) was a secondary target. One potential problem with the PIER reimbursement model (and other pharmacy reimbursement models) is that the behaviour rewarded is produced by the pharmacist, but the primary target for payment is the pharmacy.

An obvious lack of alignment exists between pharmacy and pharmacist payment systems. Although this research included a direct payment to pharmacists for performing and documenting interventions in one arm of the study, the importance of this issue was illustrated when pharmacy managers from two corporate chain pharmacies indicated that their corporate policy opposed staff pharmacists receiving payments other than salary. Pharmacies receive payment from third party payers. The majority of pharmacists, who perform the interventions and document the activity, are paid a salary with no payment incentives for providing or documenting cognitive services. There is a need to examine new salary models that align fee-for-service and salary incentives to stimulate the provision of cognitive services in community pharmacy.

The exchange (how payments are made) was clearly communicated through the PIER payment schedule and confirmed by pharmacists in their interview responses. It appeared that there was little to gain or lose for most pharmacies or pharmacists. The lack of significant financial dependency of pharmacy on the ASEBP plan was a problem in the PIER project. Pharmacies have multiple revenue sources that are individually and aggregately much larger in size than all ASEBP business. Moreover, these other revenue sources provide more revenue than could be obtained from cognitive service payments.

The typical sales breakdown in an average pharmacy is 63% for the dispensary and 37% for the front shop (includes non-prescription drugs, health and beauty aides, etc.) (Pharmacy Post, 1997). The revenue an average pharmacy in Alberta might expect from the ASEBP prescriptions would equate to 1 to 2% of the prescription sales. The revenue from PIER billings would be very small in comparison to other sources. Because of larger revenue or sales options, pharmacy organizations responded weakly or not at all to incentives for cognitive services. Pharmacists were not placed at any risk as they received the same salary whether or not they documented cognitive services.

The responsiveness of any organization to new financial opportunities is a function of the organization's financial situation. An organization would likely respond strongly to a new financial incentive if its financial position was poor. The response might not be as strong if an organization's financial picture was stable or healthy. The financial status for the majority of Alberta pharmacies was considered to be stable and healthy over the period of study.

Initially, pharmacists and pharmacy organizations received the PIER model with enthusiasm. A significant number of pharmacists attended initial orientation programs. Despite this apparent widely held enthusiasm few claims were received. Several revisions to the initial project design and monthly reminders did not boost the claim rate. Most survey respondents interpreted the PIER project broadly as a general attempt to document the value of pharmacist cognitive services to plan sponsors. The focus on demonstrating the value of the reimbursement model appeared a distant focus. It appears that pharmacists were more preoccupied with justifying cognitive services in general instead of justifying the PIER payment model.

The means for pharmacy organizations and pharmacists to respond to the PIER reimbursement was restricted by internal obstacles. The major obstacle was an inadequate internal infrastructure to support documentation of cognitive services. The two main components were a lack of integrated documentation systems and inadequate work environment in which to provide cognitive services. Most pharmacies are set up for efficient dispensing. The pharmacy software for documenting dispensing activities is integrated into the dispensing process. Providing a cognitive service is not a new activity; however, documenting these services is a recent practice procedure. The software for documenting cognitive services is not available in many pharmacies, when it is available; it is not integrated into the process of providing these services and is frequently not used. The priority for pharmacists in their daily work activities is dispensing and counseling patients. In the current workflow, pharmacists have little time to document cognitive services. In the absence of fully integrated software, pharmacist's workflow must be disrupted to integrate documentation into normal work activities.

In summary, the application of the communications model highlighted the weakness of connections between the four components of the PIER communications model. The policy was based on too simplistic an assumption and the financial incentive did not create financial dependencies for the pharmacies and pharmacists. Most pharmacists (and likely their pharmacy organizations) did not interpret the project in the direct context of a financial signal. Significant internal obstacles restricted pharmacists (and likely their pharmacy organizations) in their response. The communications model provided a framework for identifying reasons why the system, with its incentives, did not produce the intended response.

Discussion Summary

The PIER financial incentive had no effect on reported cognitive services, drug utilization and net costs, and a limited perceived effect by pharmacists. The incentive did not get interpreted and responded to in the intended way by pharmacies. These results are important because they suggest that financial incentives similar to the PIER model and applied in a similar situation, may not in themselves be a suitable policy to change pharmacist behaviour. A number of explanations for the results were presented and implications discussed. The characteristics of the ASEBP population (small size and low incidence of drug-related problems) had an important effect on the experiment. Two major obstacles were identified in the survey (inadequate pharmacy work environment and lack of internal pharmacy support systems) as also affecting the experiment. In addition, the pharmacists surveyed indicated that the perceived effect of the PIER reimbursement model was very low. The case study identified weaknesses of the PIER model as a communications process (oversimplified assumption about financial incentives, no major financial dependencies created, significant internal obstacles that restricted pharmacy responses, and few pharmacy organizations interpreted PIER as a financial incentive).

Limitations

There were a number of limitations to the research.

From the experiment, the ability to generalize to the population of all community pharmacies and pharmacists is limited. Pharmacies entered the research project on a voluntary basis. The sample of pharmacists who actually participated by submitting

claims was small and their demographic characteristics were significantly different than the non-respondent accessible population of PIER pharmacists. A second limitation was the measurement of cognitive services. Documentation was used as the measure that a cognitive service was provided. A self-reporting measure for pharmacists was used without any validation through direct observation. Pharmacists have a history of poor documentation of their cognitive services activities. Pharmacist feedback and experience from other research indicates a potential under-reporting of 50% (Loh et al., 1996). A third limitation was the small amount of documentation submitted by pharmacists. The experiment lacked sufficient power to detect a significant difference. In sample size determinations the following were used: the significance criterion was 0.05, the effect size was small (0.2) or moderate (0.5), and the power was 0.80. The effect size observed in the experiment was close to 0. With such a small effect size, and the small sample size achieved, the actual power attained was very low. The beta error (i.e., rate of failing to reject the null hypothesis) for the PIER experiment was very high. The final limitation in the experiment was a violation of the assumption that all observations were independent. Thirty-one pharmacists in both the control and test groups submitted repeated observations of more than one claim (71% of total claims). Pharmacists submitting multiple claims were equally distributed among the three payment groups. One pharmacist in the control group submitted 10 separate claims. This violation reduced the variation due to the individual pharmacist and thus reduced the sensitivity of the chi-square statistical tests.

There were two main limitations identified with the interviews. First, the validity of the instrument was not sufficiently established prior to its use. The instrument was

developed to collect structured feedback from pharmacists about project and reimbursement model obstacles, impact and understanding. The questions were based on questions from other research projects. The instrument was pre-tested with a small sample of pharmacists to assess administration time and content. Construct validity was not established for the five scenarios used to evaluate pharmacists' understanding of the value-added concept. Second, a number of the questions were predicated on the assumption that respondents were familiar with the project and the reimbursement model. Half the respondents were not aware which reimbursement group they belonged to and only one-quarter of the respondents had submitted a claim form. As a result, the numbers of "do not know" or "no responses" were sizeable for a number of questions. Many questions required a degree of knowledge about the project.

The major limitation in the case study was the application of the communications model to a time-limited study rather than a full policy implementation. The study included a convenience sample of pharmacies and had a limited time frame of 18 months. The meaning, interpretation and response to financial incentives are likely to vary in a voluntary and temporary project compared to a permanent situation. Another potential limitation was the application of the communications model in the context of the PIER project. The CHEPA communication model was applied to situations in the public sector policy arena, while in this research, it was used to evaluate a private sector policy.

CHAPTER VI

CONCLUSION

Published evidence suggests that a health care provider's practice behaviour can be affected by new reimbursement systems. The research was conducted to determine if pharmacy practice behaviour could be affected by new models of reimbursement. There is limited knowledge about the effects of reimbursement on pharmacy practice behaviour.

The experiment examined whether pharmacists' cognitive services, changes in drug utilization and resulting costs were affected by a new pharmacy reimbursement model. The experiment yielded a low documentation rate of cognitive services by pharmacists and indicated that the new reimbursement model had no apparent effect on documented reports of cognitive services, drug utilization or costs. Because of the low documentation rate, the experiment lacked statistical power. These findings were explained by a relatively small patient population with few drug-related problems, and a lack of automated documentation systems for use by pharmacists.

Pharmacists' perceptions about the PIER reimbursement model were examined using telephone interviews. It was found that half the participating pharmacists lacked knowledge about the project. Pharmacists reported that obstacles such as a lack of time, and a lack of computerized systems for client identification and documentation were the reasons for the low completion rate. These factors overcame the effect of a financial incentive. Most pharmacists reported that the PIER reimbursement model had no affect on their practice behaviour. The interview results suggest that financial incentives may not be effective because other obstacles to changing practice were not overcome.

The reimbursement model was examined using a case study based on a communication model for financial incentives. The PIER financial incentive did not work well as a signal within the communications framework. The hypothesis that pharmacists' practice behaviour could be changed solely by a financial incentive did not materialize. As a signal, the PIER incentive was based on simplistic assumptions and had no financial risk attached to its use or non-use. This diminished its influence.

This research makes the following contribution to the current body of evidence. First, it provides a comprehensive review of pharmacy and pharmacist reimbursement models, and their effectiveness. Second, it provides a new pharmacy reimbursement model for Canadian community pharmacies. Third, it attempts to replicate research providing strength for the evidence about the effects of reimbursement.

The research findings have two major implications for future projects and policies using payment systems to alter pharmacist practice and drug utilization.

(1) The effectiveness of behavioural change strategies (e.g., payment systems) will continue to be impeded by two major obstacles faced by community pharmacists: lack of time and inadequate pharmacy systems for documentation of services.

(2) The strategy of changing a single determinant of pharmacy practice (reimbursement) may not be an effective means of changing pharmacy practice behaviour.

First, the success of any pharmacist behavioural change strategy will be compromised as long as pharmacists are hampered in providing cognitive services by major work environment obstacles such as lack of time and inadequate pharmacy systems. It should be a major concern to all pharmacy stakeholders that a short and simple documentation form is not easily completed in the workplace by most

pharmacists. Efforts are required by pharmacy managers and corporations with pharmacies to determine solutions to these obstacles. Future strategies to change pharmacists' behaviour will likely require several workplace changes.

Second, the strategy of changing a single determinant of pharmacy practice may not be sufficient for influencing pharmacy practice behaviour. Research on the effect of physician payment systems has shown that payment systems reinforce behavioural change (Tamblyn, Battista, 1993). Practice change occurs through enabling factors and interventions such as practice settings, practice aids, standards and feedback, and administrative policy. The implementation of new payment models may only be effective for reinforcement of change brought about from new practice settings, new computer systems, and management priorities. In future research and policy strategies, the emphasis should be placed on combinations of interventions such as the introduction of an enabling factor followed by the introduction of a reinforcing factor.

The finding that a financial incentive may have no significant effect on the provision and documentation of cognitive services, drug utilization and costs was not surprising when other Canadian health research is considered. The findings from the PIER project case study were comparable to those seen in the Financial Incentives project. This research highlights the need for a multifactorial process in evaluating the effect of financial incentives in pharmacy.

Recommendations

The following are recommendations for policy makers and researchers. It is recommended that:

(1) Protocols to evaluate the effect of community pharmacy payment systems should include both quantitative and qualitative approaches because of the complexity of the systems involved.

(2) Pharmacy owners and managers should implement changes to overcome the lack of time and inadequate operational systems in order to have pharmacists expand their professional activities.

(3) The effectiveness of various pharmacy payment systems should be evaluated in different types of drug benefit plans (e.g., small and large sized, private and public, low risk and high risk populations).

(4) Discussion and clarification should be initiated by the pharmacy profession with payers regarding new pharmacy payment models and concepts such as value-added services.

(5) The effectiveness of pharmacy payment systems should be evaluated in conjunction with other changes which affect practice behaviour, e.g., changes to practice settings, pharmacy computer systems, management priorities, etc.

(6) The effects of new combinations of payment systems should be examined, e.g., fee-for-service payments for cognitive services combined with capitation for dispensing or fee-for-service for cognitive services combined with a performance based salary system.

(7) A greater use of observational techniques should be used to determine the nature of cognitive services provided.

(8) Performance based salary payment systems should be developed and evaluated for pharmacists.

(9) A higher priority should be given by payers to the development of financial incentives that improve the quality (appropriateness) of the cognitive services pharmacists provide rather than the current focus on the quantity of services.

REFERENCES

Alberta Pharmaceutical Association. (1995). Pharmaceutical Profession Act. Edmonton, AB.

Alberta Pharmaceutical Association. (1996). Standards of practice - The pharmacist. Edmonton, AB.

Altimed. (1997). The Altimed CFP report on pharmacy services 1997 – Consumers perceptions of pharmacy. Toronto, ON.

Altimed. (1998). The Altimed CFP report on pharmacy services 1998 - Private payers' perceptions of pharmacy. Toronto, ON.

American Pharmaceutical Association. (1994). A new outpatient pharmacy services benefit: Achieving value from pharmacist services. Washington, DC.

American Pharmaceutical Association. (1994). Pharmacists as primary care health professionals. Washington, DC.

American Pharmaceutical Association. (1998). Pharmacist practice activity classification 1.0. Washington, DC.

American Psychological Association. (1991). Publication Manual of the American Psychological Association. Third Edition. Washington, DC.

Banahan, B. F., Bentley, J. P., & McCaffrey, D. J. (1995, March). Documenting retail pharmacist interventions: What's being done and what needs to be done. APhA Annual Meeting, 142.

Berger, B. A., & Grimley, D. (1997). Pharmacists' readiness for rendering pharmaceutical care. Journal of the American Pharmaceutical Association, NS37(5), 535-542.

Bero, L. A., Mays, N. B., Barjesteh, K., & Bond, C. (1998). Expanding outpatient pharmacists' roles and health services utilization, costs, and patient outcomes (Cochrane Review). In: The Cochrane Library, Issue 3. Oxford: Update Software.

Birch, S., Goldsmith, L., & Makela, M. (1994). Paying the piper and calling the tune: Principles and prospects for reforming physician payment methods in Canada (paper 94-16). Hamilton: McMaster University, Centre for Health Policy Analysis.

Braden, L. L. (1995). Compensation for cognitive services in community pharmacy. American Pharmacy, NS 35(3), 58-65.

Bradley, D. (1998). The Saskatchewan trial prescription program. Unpublished master's project, University of Saskatchewan, Saskatoon, SK.

Brogan, T., Fearnley, J., Midena, M., & Stewart, R. (1997). Handbook on private drug plans. Toronto, ON: Merck Frosst Canada, Inc.

Canadian Pharmaceutical Association. (1971). Pharmacy in a new age (Report of the Commission on Pharmaceutical Services). Toronto, ON.

Canadian Institute for Health Information. (1997). National health expenditure trends, 1975-1997. Ottawa, ON.

Canadian Pharmaceutical Association. (1997). Provincial drug benefit programs. Ottawa, ON.

Canadian Pharmacists Association. (1998). Report from Working Group on Pharmacy Reimbursement Methods. Ottawa, ON.

Christensen, D. B. (1996). The Washington State health care financing administration cognitive services demonstration. Journal of Research in Pharmaceutical Economics, 8 (1), 161-170.

Christensen, D. B., Fassett, W. E., & Andrews, G. A. (1993). A practical billing and payment plan for cognitive services. American Pharmacy, NS33 (3), 34 - 40.

Christensen, D.B., Hansen, R.W. (1999). Characteristics of pharmacies and pharmacists associated with the provision of cognitive services in the community setting, Journal of the American Pharmaceutical Association, 39(5), 640-649.

Christensen, D. B., & Holmes, G. H. (1996). Payment of pharmacists for cognitive services - Results of the Washington State C.A.R.E. demonstration project (Contract No. 11-C-90229). Washington, DC: Health Care Financing Administration.

Christensen, D.B., Holmes, G., Fassett, W.E., Neil, N., Andrilla, C.H., Smith, D.H., Andrews, A., Bell, E.J., Hansen, R.W., Shafer, R., and Stergachis, A. (1999). Influence of a financial incentive on cognitive services: CARE project design / implementation. Journal of the American Pharmaceutical Association, 39 (5), 629-639.

Cirn, J. T. (Summer, 1980). Pharmacists' views of an experience in capitation reimbursement under the Iowa Medicaid Drug program. Contemporary Pharmacy Practice, 3 (3), 180-188.

Coambs, R. B., Jensen, P., Hao Her, M., Ferguson, B. S., Jarry, J. L., Wong, J. S. W., & Abrahamsohn, R. V. (1995). Review of the scentific literature on the prevalence, consequences, and health costs of noncompliance & inappropriate use of prescription medication in Canada. Ottawa, ON: Pharmaceutical Manufacturers Association of Canada.

Cohen, J. (1988). Statistical power analysis for behavioural sciences, (3rd Edition), New York, NY: Academic Press.

Crocker, L., & Algina, J. (1986). Introduction to classical and modern test theory. Orlando, FL: Holt, Reinhart and Winston, Inc.

Daniels, W.W. (1990). Applied Nonparametric Statistics, (2nd Edition), Boston, MA: PWS Kent Publishing Company.

Dobie, R. L., & Rascati, K. L. (1994). Documenting the value of pharmacist interventions. American Pharmacy, NS34 (5), 50-54.

Dumas, J. (1994). Part I - Perceptions of the pharmaceutical opinion by community pharmacists in Quebec (Report to Ministry of Health and Social Services). Quebec: Laval University.

Dumas, J., & Matte, J. (1992). Characteristics of pharmaceutical opinions written in a Quebec pharmacy. Annals of Pharmacotherapy, 26, 835-839.

Dumas, J., & Matte, J. (1994). Part II - Characteristics of the pharmaceutical opinions produced by community pharmacy (Report to Ministry of Health and Social Services). Quebec: Laval University.

Dumas, J., Matte, J., & Pednault, L. (1994). Pharmaceutical opinion. (Series of translated reports) Quebec: Laval University.

Einarson, T. (1993). Drug-related hospital admissions. Annals Pharmacotherapy, 27, 832 – 840.

Field, P. A., & Morse, J. M. (1985). Nursing research - The application of qualitative approaches. Rockville, MA: Aspen Publishers, Inc.

Fielding, D., Hill, D., Stratton, T., & McKelvey, S. (1993-94). Value added: Solving prescription problems. Canadian Pharmaceutical Journal, 126, 505-508.

Finchman, J. & Hunter, J. (1996). Part 2 - Documenting the worth of pharmacist care. NARD Journal, April, 29-32.

Flannery, T. P., Hofrichter, D. A., & Platten, P. E. (1997). People, performance, and pay - Dynamic compensation for changing organizations. New York, NY: The Free Press.

Gagnon, J. P. (1989). Defining and marketing value-added pharmacy services in a community pharmacy. Pharmacy Times, 55 (8), 61-67.

Gall, M.D., Borg, W. R., Gall, J. P. (1996). Educational research – An introduction (6th Edition). White Plains, NY: Longman Publishers.

Gariepy, Y. (1997, March). Pharmacy "value-added" – can we prove it? Paper presented for Satelite symposium – California Pharmacy Benefit Manager Study Group.

Giacomini, M., & Goldsmith, L. (1996). Case study methodology for studying financial incentives in context (paper 96-15). Hamilton: McMaster University, Centre for Health Economics and Policy Analysis.

Giacomini, M., Hurley, J., Lomas, J., Bhatia, V., & Goldsmith, L. (1996). The many meanings of money: A health policy analysis framework for understanding financial incentives (paper 96-6). Hamilton: McMaster University, Centre for Health Economics and Policy Analysis.

Giacomini, M., Lomas, J., Hurley, J., Bhatia, V., & Goldsmith, L. (1996). The devil in the details: Some conclusions about how funding changes translate into financial incentives in the Canadian health system (paper 96-14). Hamilton, ON: McMaster University, Centre for Health Economics and Policy Analysis.

Glaser, W. A. (1970). Paying the Doctor - Systems of remuneration and their effects. Baltimore: Johns Hopkins Press.

Greenfield, S., Nelson, E. C., Zubkoff, M., Manning, W., Rogers, W., Kravitz, R. L., Keller, A., Tarlov, A. R., & Ware, J. E. (1992). Variations in resource utilization among medical specialties and systems of care - Results from the Medical Outcomes study. JAMA, 267 (12), 1624 - 1630.

Greene, R. (1995). Survey of prescription anomalies in community pharmacies: (1) Prescription monitoring. The Pharmaceutical Journal, 254, 476-481.

Greene, R. (1995). Survey of prescription anomalies in community pharmacies: (2) Interventions and outcomes. The Pharmaceutical Journal, 254 , 873-875. June 24/95

Grootendorst, P., Goldsmith, L., Hurley, J., O'Brien, B., & Dolovich, L. (1996). Financial incentives to dispense low-cost drugs: A case study of British Columbia Pharmacare (paper 96-8). Hamilton: McMaster University, Centre for Health Economics and Policy Analysis.

Hatoum, H. T., & Akhras, K. (1993). 1993 Bibliography: A 32-year literature review on the value and acceptance of ambulatory care provided by pharmacists. Annals of Pharmacotherapy, 27, 1106-19.

Helling, D. K., Yesalis, C. E., Norwood, J., Burmeister, L. F., Lipson, D. P., Fisher, W. P., & Jones, M. E. (1981). Effects of capitation payment for pharmacy services on pharmacist-dispensing and physician-prescribing behaviour: I. Prescription quantity and dose analysis. Drug Intelligence and Clinical Pharmacy, 15, 581-589.

Hepler, C. D., & Strand, L. M. (1990). Opportunities and responsibilities in pharmaceutical care. Am. J. Hosp. Pharm. 47, 533-543.

Holloway, P. J., Lennon, M. A., Mellor, A. C., Coventry, P., & Worthington, H. V. (1990). The capitation study. 1. Does capitation encourage 'supervised neglect'? British Dental Journal, 119-121.

Ishii, M. (1994). Unlocking pharmacists' potential - How pharmacists might provide cognitive services ... and get reimbursed for them. California Pharmacist, June, 24 - 31.

Ito, S.M., Blackburn, S. (Eds.). (1995). A Pharmacist's Guide to Principles and Practices of Managed Care Pharmacy. Alexandria, VA: Academy of Managed Care Pharmacy.

Janke, K. K., & MacLeod-Richards, C. J. (1997). Initiating practice change - Analysing pharmacy systems and optimizing dispensary functioning. Canadian Pharmaceutical Journal, 130 (2), 37-38, 40.

Jevne, R., Zingle, H., Eng, A., Ryan, D., Hazen, L., & Mortemore, E. (1994). Myths and realities of teacher health. International Journal for the Advancement of Counselling, 17, 3-17.

Jobson, J.D. (1991). Applied Multivariate Data Analysis - Volume 1: Regression and Experimental Design. New York, NY: Springer.

Johnson, J. A., & Bootman, J. L. (1995). Drug-related morbidity and mortality - A cost-of-illness model, Arch Intern Med, 155, 1949 - 1956.

Knapp, D. A. (1979). Barriers faced by pharmacists when attempting to maximize their contribution to society. Am. J. Pharm. Educ., 43, 357-359.

Knapp, K.K., Katzman, H., Hamright, J.S., & Albrant, D.H. (1998). Community pharmacist interventions in a capitated pharmacy benefit contract. Am J Health - Syst Pharm, 55, 1141-1145.

Kristiansen, I. S. & Mooney, G. (1993). Remuneration of GP services: time for more explicit objectives? A review of the systems in five industrialized countries. Health Policy, 24, 203-212.

Lennon, M. A., Worthington, H. V., Coventry, P., Mellor, A. C., & Holloway, P. J. (1990). The capitation study. 2. Does capitation encourage more prevention? British Dental Journal, 213-215.

Lipson, D. P., Yesalis, C. E., Kohout, F. J., & Norwood, J. (1981). Capitation payment for Medicaid pharmacy services: impact on non-Medicaid prescriptions. Medical Care, 19, 342-353.

Lipton, H., Byrns, P., Soumerai, S., & Chrischilles, E. (1995). Pharmacists as agents of change for rational drug therapy, International Journal of Technology Assessment in Health Care, 11 (3), 485-508.

Lipton, H. L., & Bird, J. A. (1993). Drug utilization review in ambulatory settings: State of the science and directions for outcomes research. Medical Care, 31(12), 1069 - 1082.

Loh, E. A., Waruszynski, B., & Poston, J. (1996). Cost savings associated with community pharmacist interventions in Canada. Canadian Pharmaceutical Journal. Feb, 43-55.

Lopatka, H. (1997, February). Alternative reimbursement for pharmacist services. Pharmacy Post supplement, Issues in Managed Care, 1-2.

Lopatka, H., & Bachynsky, J. (1995). Prescription watch 1999: A one-day prescription intervention study. Canadian Pharmaceutical Journal, 128 (3), 27 –31, 52.

MacKeigan, L. D., Segal, H. J. & Coyte, P.C. (1995). Post study interview questions. Alternative reimbursement project. For the Joint Task Force of the Ontario Ministry of Health and the Ontario Pharmacists' Association.

Manasse, H. R. (1989). Medication use in an imperfect world - Drug misadventuring as an issue of public policy. Bethesda, MD: ASHP Foundation.

McCormack, J. Reinhardt, G. Hastings, J., & McGuirt, R. (1996). Documented value - Arkansas study shows pharmacists who get paid document more interventions. NARD Journal, March, 39 - 41.

McDonald, S., & Lopatka, H. (1997). Pharmacy capitation: Financial risk for providing pharmaceutical care. Canadian Pharmaceutical Journal. 130 (5), 34-42.

McKay, A. B., Hepler, C. D., Knapp, D. A. (1987). How to evaluate progressive pharmaceutical services. Bethesda, MD: ASHP Research and Education Foundation.

Meade, V. (1994). Getting paid for cognitive services. American Pharmacy, NS34 (6), 32 - 36.

Mellor, A. C., Coventry, P., Worthington, H. V., Holloway, P. J., & Lennon, M. A. (1990). The capitation study. 3. The views of participating dentists and the profession. British Dental Journal, 303-305.

Metropolitan Toronto Pharmacists' Association – Ontario Pharmacists' Association. (1998). Final results of the managed medication use program for municipality of metro Toronto (Executive Summary). Toronto, ON.

Morgan, S. G. (1997). Issues for Canadian pharmaceutical policy. Health Policy Unit Discussion Paper Series (HPRU 97:5D). Vancouver, BC: Centre for Health Services and Policy Research.

National Pharmacy Coalition on Managed Care. (1997). Components of an ideal drug benefit plan. Ottawa, ON: Canadian Pharmaceutical Association

National Pharmacy Coalition on Managed Care. (1997). Pharmacists as key partners in drug plan management. Ottawa, ON: Canadian Pharmaceutical Association.

National Pharmacy Coalition on Managed Care. (1998). Trial prescription programs – National guideline. Ottawa, ON: Canadian Pharmacists Association.

Norwood, G. J., Helling, D. K., Burmeister, L. F., Jones, M. E., Yesalis, C. E., Fisher, W. P., & Lipson, D. P. (1981). Effects of capitation payment for pharmacy services on pharmacist-dispensing and physician-prescribing behaviour: II. Therapeutic category analysis, over-the-counter drug usage, and drug interactions. Drug Intelligence and Clinical Pharmacy, 15, 656-664.

Ontario Pharmacists' Association. (1997). Final results of the managed medication use program for Municipality of Metro Toronto, Toronto, ON.

Peeples, P., Wertheimer, A., Mackowiak, J., & McGhan, W. (1997). Controversies in measuring and valuing indirect costs of productivity foregone in a cost of illness evaluation, Journal of Research in Pharmaceutical Economics, 8 (3), 23-32.

Peeples, P., Wertheimer, A., Mackowiak, J., & McGhan, W. (1997). Assessment and measurement of worker productivity, Journal of Research in Pharmaceutical Economics, 8 (3), 33-46.

Pharmacy Post. (1996). The 1996 pharmacy business trends report, Toronto, ON: Eli Lilly Canada.

Pharmacy Post. (1997). 1997 Pharmacy business trends report, Toronto, ON: Eli Lilly Canada & Pharmascience.

Pharmacy Practice. (1996). A report from the trenches. Pharmacy Practice, 12 (12), 25 – 41.

Poirier, S., & Gariepy, Y. (1996). Compensation in Canada for resolving drug-related problems. Journal of American Pharmaceutical Association, NS36 (2), 117-122.

Poirier, S., Knapp, D. A., Lepage, Y., Blass, T., Speedie, S. M., & Fedder, D. O. (1997). The development of a relative-value scale in processing prescriptions, Journal of Research in Pharmaceutical Economics, 8(4), 55-84.

Portner, T., & Srnka, Q. (1994). NARD's pharmacist care claim form. NARD Journal, 55-65.

Poston, J. W., Cooper, J. M., Bruce, L. D., & Parn, L. (1994). Getting paid for patient-focussed services, Proceedings of a Working Group Meeting. Ottawa, ON: Canadian Pharmaceutical Association.

Poston, J., Kennedy, R., & Waruszynski, B. (1995). Initial results from the community pharmacist intervention study. Canadian Pharmaceutical Journal, 127(10), 18-25.

Quinn, K., Baker, M., & Evans, B. (1992). Who uses prescription drugs? Results from a population-wide study in Saskatchewan. Saskatchewan Health.

Raisch, D. W. (1992). Relationships among prescription payment methods and interactions between community pharmacists and prescribers. Annals Pharmacotherapy, 26, 902-906.

Raisch, D. W. (1993). Barriers to providing cognitive services. American Pharmacy, NS33(12), 54-58.

Raisch, D. W. (1993). Patient counselling in community pharmacy and its relationship with prescription payment methods and practice settings. Annals Pharmacotherapy, 27, 1173-1179.

Rupp, M. (1996). Compensation for pharmaceutical care. In C. H. Knowlton, R. P. Penna (Eds.), Pharmaceutical care (pp. 257-282). New York, NY: Chapman & Hall.

Rupp, M. T. (1992). Value of community pharmacists' interventions to correct prescribing errors. Annals of Pharmacotherapy, 26, 1580-1584.

Rupp, M. T. (1995). Standardizing documentation for filing pharmaceutical care claims. American Pharmacy, NS35 (9), 26-30.

Rupp, M. T., Deyoung, M., & Schondelmeyer, S. W. (1992). Prescribing problems and pharmacist interventions in community practice. Medical Care, 30 (10), 926-940.

Rupp, M. T., & Kreling, D. H. (1994). The impact of pharmaceutical care on patient outcomes: What do we know? In Patient Outcomes of Pharmaceutical Interventions: A Scientific Foundation for the Future (pp. 53 - 65). Washington, DC: American Pharmaceutical Association.

Safran, D. G., Tarlov, A. R., & Rogers, W. H. (1994). Primary care performance in fee-for-service and prepaid health care systems - Results from the Medical Outcomes study. JAMA, 271 (20), 1579 - 1586.

Salant, P. & Dillman, D.A. (1994) How to Conduct Your Own Survey, New York: John Wiley and Sons., Inc.

Segal, H. J. (1989). Pricing. In A. Archambault, J. A. Bachynsky, H. J. Segal (Eds.), Pharmacy management in Canada (pp. 255-274). Toronto: Grosvenor House Press.

Semelman, S.A. (1999, May). ESI Clinical Programs and Medical Management. Presentation at the Canadian Pharmacists Association Annual Meeting, London, ON.

Schumock, G. T., Meek, P. D., Ploetz, P. A., & Vermeulen, L. C. (1996). Economic evaluations of clinical pharmacy services - 1988-1995. Pharmacotherapy, 16(6), 1188-1208.

Smith, D.H., Fassett, W.E., Christensen, D.B. (1999). Washington state CARE project: downstream cost changes associated with the provision of cognitive services by pharmacists, Journal of the American Pharmaceutical Association, 39 (5), 650-657.

Smith, F. (1997). General Motors pharmacist intervention study (Executive Summary). London, ON: Nera Communications.

Soumerai, S. B., Ross-Degnan, D., Fortess, E. E., & Walser, B. L. (1997). Determinants of change in Medicaid pharmaceutical cost sharing: Does evidence affect policy? The Milbank Quarterly, 75(1), 11 – 33.

SPSS. (1993). SPSS for windows base system user's guide – Release 6.0. Chicago, IL.

St. Anthony Publishing. (1998). Coding and reimbursement guide for pharmacists. Washington, DC.

Strand, L. M., Morley, P. C., Cipolle, R. J., Ramsey, R., Lamsam, G. D. (1990). Drug-related problems: their structure and function. DICP Ann Pharmacother. 24, 1093-1097.

Stuart, B., & Yesalis, C. (1990). The Iowa pharmacy capitation experiment: Economic incentives and provider performance. Journal of Research in Pharmaceutical Economics, 2(2), 35-55.

Sullivan, K. (1996). An evaluation of the use of trial prescriptions in community pharmacy practice. Unpublished master's thesis, University of Alberta, Edmonton, AB.

Tamblyn, R., & Battista, R. (1993). Changing clinical practice: Which interventions work? Journal of Continuing Education in the Health Professions, 13, 273 - 288.

Tamblyn R., & Perreault, R. (1997). Encouraging the wise use of prescription medication by older adults. Summary of Paper Commissioned by the National Forum on Health, Ottawa, ON.

Tarlov, A. R., Ware, J. E., Greenfield, S., Nelson, E. C., Perrin, E., & Zubkoff, M. (1989). The Medical Outcomes study - An application of methods for monitoring the results of medical care. JAMA, 262 (7), 925 - 930.

Venkataraman, K., Madhavan, S., & Bone, P. (1997). Barriers and facilitators to pharmaceutical care in rural community practice. Journal of Social and Administrative Pharmacy, 14 (4), 208 – 219.

Ware, J. E., Bayliss, M. S., Rogers, W. H., Kosinski, M., & Tarlov, A. R. (1996). Differences in 4-year health outcomes for elderly and poor, chronically ill patients treated in HMO and fee-for-service systems. JAMA, 276 (13), 1039 - 1047.

Whitmore, S. (1997). Assessing value and reimbursing providers for value services: Wisconsin Medicaid. Journal of Research in Pharmaceutical Economics, 8(4), 7 - 23.

Winter, R., & Winter, P. (1997). Special Edition Using Microsoft Office 97 – Professional. Indianapolis, IN: Que Corporation.

Witte, R.S. (1993). Statistics (4th Edition), Forth Worth, TX: Harcourt Brace College.

Working group bibliography. (1989). Payment for cognitive services: the future of the profession. Am. Pharm. NS 33, 768.

Yesalis, C. E., & Levitz, G. S. (1985). The life and death of a field experiment: a case study of health care research in a hostile environment. Journal of Health Politics, Policy and Law, 9 (4), 611-628.

Yesalis, C. E., Lipson, D. P., Norwood, J., Helling, D. K., Burmeister, L. F., Jones, M. E., & Fisher, W. P. (1984). Capitation payment for pharmacy services: I. Impact on drug use and pharmacist dispensing behaviour. Medical Care, 22, 737-745.

Yesalis, C. E., Norwood, J., Helling, D. K., Lipson, D. P., Mahrenholz, R. J., Burmeister, L. F., Jones, M. E., & Fisher, W. P. (1984). Capitation payment for pharmacy services: II. Impact on costs. Medical Care, 22, 746-754.

Yin, R. K. (1994). Case study research - Design and methods. Thousand Oaks, CA: Sage Publications, Inc.

APPENDIX A: Ethical Review Approval Letter

University of Alberta
Edmonton
Canada T6G 2N8

Faculty of Pharmacy and Pharmaceutical Sciences
3118 Dentistry/Pharmacy Centre, Telephone (403) 492-3362
Fax (403) 492-1217

2 October 1995

To: Harold Lopatka
Ph.D. Provisional Candidate
Faculty of Pharmacy & Pharmaceutical Sciences

From: Karen B. Farris, Ph.D.
Secretary
Dentistry/Pharmacy Human Ethics Committee

This letter confirms that your project entitled "Pharmacy alternative reimbursement evaluation (The Alberta pharmacy incentives and evaluation of reimbursement project - PIER project)" has received human ethics approval from the committee.

cc: dfb/lwk

APPENDIX B: Agreement Letter/Consent Form

Letter of Agreement with Pharmacy

The pharmacy, _____, agrees to participate in APEC/ASEBP pharmacy alternative reimbursement project.

The pharmacy agrees to the following responsibilities:

- to be assigned to either the existing or new reimbursement model for the provision of pharmaceutical services and care to ASEBP beneficiaries for 12 month period

- to provide consultative services as defined in the services schedule

- to send all pharmacists to a scheduled initial 1/2 day orientation and training session

- to designate a contact pharmacist for ongoing liaison with the researcher

- to provide staff pharmacists with project information, updates and surveys

- to document in the defined format all pharmacist interventions carried out for ASEBP beneficiaries over the 12 month period

- to submit documentation and claims according to the time frames and in accordance with the formats outlined in the project manual

- confidentiality of the identity of all ASEBP clients must be maintained by each pharmacy

When results are presented, the identity will not be provided for individual pharmacies and pharmacists.

Complete responsibilities of the researcher and specific information about the project is contained in the project procedure manual. A copy of the manual has been provided to each participating pharmacy. If you have any questions or require clarification about any parts of this agreement please contact:

Harold Lopatka
Principal Investigator
APEC/ASEBP Alternative Pharmacy
Reimbursement Project
Alberta Pharmaceutical Association
Ph. (403) 990-0321
FAX (403) 990-0328

If at any time the pharmacy chooses to voluntarily withdraw from the project, the pharmacy must ASAP notify the principal investigator, Harold Lopatka. The pharmacy will not be adversely affected in any way on future plan payments as a result of this withdrawal.

The undersigned parties fully understand the requirements of this project and agree to the conditions set out in this agreement.

_____ _____
Pharmacy Owner/Manager Researcher

_____
Date

Project Title: Alberta's P.I.E.R. Project - Pharmacy Incentives and Evaluation of Reimbursement (Pharmacy Alternative Reimbursement Evaluation)

Pharmacist Project Information Sheet

Principal Investigator:
Harold Lopatka, B.Sc. Pharm., M.H.S.A.

University Supervisor:
Dr. John Bachynsky, Ph.D.

Background
Most pharmacists and published pharmacy literature agree that pharmacists are not reimbursed appropriately for the services they currently provide and for the services which are required in the pharmaceutical care model. The current dispensing fee provides reimbursement for distributive and professional services. An alternative reimbursement model is required which appropriately reflects the distributive and professional services pharmacists provide. Evidence about the comparative benefits and costs of a new reimbursement approach is required by payors, pharmacy owners, and pharmacists prior to implementation.

Purpose
You are being asked to participate in this project to compare the effects of the current pharmacy reimbursement model with an alternative pharmacy reimbursement model. The effects of an alternative reimbursement model will be examined for changes; in pharmacy practice, pharmacist attitudes or preferences, and Alberta School Employee Benefit Plan (ASEBP) long-term disability claims and drug utilization.

Procedures
Participation in this study will involve:

1) Completion of documentation claim/intervention forms (for ASEBP clients only).

2) Participation in a telephone interview with the research coordinator, and/or completion of a midpoint opinion questionnaire.

3) Completion of a personal opinion questionnaire to present formal feedback regarding the project after it is completed.

Pharmacies in the entire region will be payed according to one of three models. Group A pharmacies are the control group and will receive no additional payments. Group B pharmacies receive payments of $0, $8.50, or $17.00 for consultative services as outlined in the project manual. Group C pharmacies receive the same payments as Group B, however the pharmacist responsible for the consultative service will receive a 50% share of the payment.

Procedures are detailed in the project orientation manual (2 copies are available for each participating pharmacy).

Possible Benefits
The possible benefit to you for participating in this study is that you or your pharmacy you will receive reimbursement for consulting services you currently provide. In addition, you will gain experience with a standardized documentation system for pharmacist interventions.

Possible Risks
A possible risk to you for participating is that you will get behind in other work activities when performing interventions and in the required documentation.

Confidentiality
All data will be kept confidential. The data will not be used for any APhA regulatory activity. Any report published as a result of this project will not identify you or your pharmacy by name.

Your participation in this approximate 1 year study is appreciated. If, for whatever reasons, you want to terminate your participation in performing interventions and documentation, you are free to request your pharmacy's withdrawal from the study. If, for whatever reasons, you do not want to participate in the pharmacist opinion survey and/or interviews, you are free to withdraw from this part of the study. Neither you nor your pharmacy will be affected in any way. If any knowledge gained from this or any other study becomes available which could influence your decision to continue in the study you will be promptly informed.

Please contact the individuals identified below if you have any questions or concerns:

Harold Lopatka, B.Sc. Pharm., M.H.S.A.
Director, Pharmacy Economics
Alberta Pharmacy Economics Committee
Alberta Pharmaceutical Association
Phone: (403) 990-0321
Phone: (403) 492-3362, University of Alberta

Dr. John Bachynsky, Ph.D.
Professor
Faculty of Pharmacy and Pharmaceutical Sciences
University of Alberta
Phone: (403) 492-0202

Pharmacists' Informed Consent Form

Project Title: Alberta's P.I.E.R. Project - Pharmacy Incentives and Evaluation of Reimbursement (Pharmacy Alternative Reimbursement Evaluation)

Principal Investigator:
Harold Lopatka, Director Pharmacy Economics
Phone: (403) 990-0321 APhA/APEC; (403) 492-3362 U of A

University Supervisor:
Dr. John Bachynsky, Professor
Phone: (403) 492-0202

	Yes	No
Do you understand that you have been asked to be in a research project?	___	___
Have you read and received a copy of the attached Information Sheet?	___	___
Do you understand the benefits and risks involved in taking part in this research project?	___	___
Have you had an opportunity to ask questions and discuss this project?	___	___
Do you understand that your pharmacy is free to withdraw from the project at any time, without having to give a reason and without affecting your future status with the APhA or ASEBP?	___	___
Do you understand that you are free to withdraw from participating in the opinion survey and/or interview?	___	___
Has the issue of confidentiality been explained to you?	___	___
Do you understand who will have access to the project data? (i.e., intervention reporting and attitude survey results)	___	___

Who explained this study to you?_____

I agree to take part in this project: ___ ___

Signature of pharmacist _____

Printed name _____

Date _____

Signature of witness _____

Signature of investigator or assistant _____

PIER 1 C2 (09/04/95)

APPENDIX C: Sample Case Study from Pharmacists' Orientation and Training Sessions

CASE STUDY #1

T.M. is a 15 year old male who comes to your pharmacy with his parents. His parents tell you that T.M. has just been diagnosed with asthma. Unfortunately, they don't know about asthma and the doctor did not tell them much about T.M's condition. They present you with the following prescription.

Salbutamol MDI 100 mcg
M: 200 dose
Sig: Inhale 1-2 puffs q6h prn
Refills: 3

Also, T.M.'s parents said that the doctor told them to purchase a peak flow meter, however, he never had time to explain why or how to use it. As a result, you fill the prescription and arrange for a detailed counseling session for T.M. and his parents. The following intervention form was completed.

P.I.E.R. PROJECT CLAIM/INTERVENTION FORM

SITE ID 123 Subscriber ID 12123456789 Date 950808 Rx# 111111 RPh ID 1234 Int. (68) Time (Min.) 30

ORIGINAL Rx INFORMATION			DISPENSED Rx INFORMATION		
DIN: 00851841	QTY: 200	DAYS SUPPLY:	DIN: 00851841	QTY: 200	DAYS SUPPLY:

Problem:

- ( ) SUBOPTIMAL Drug 01
- ( ) SUBOPTIMAL Dose 02
- ( ) SUBOPTIMAL Dosage Regimen 03
- ( ) SUBOPTIMAL Dosage Form/Route of Admin 04
- ( ) SUBOPTIMAL Duration of Use 05
- ( ) SUBOPTIMAL: Unnecessary Drug Therapy 06
- ( ) DRUG: Therapeutic Duplication 11
- ( ) DRUG-Drug Interaction 21
- ( ) DRUG-Disease Interaction 22
- ( ) DRUG-Allergy/Intolerance 23
- ( ) DRUG-Food Interaction 24
- ( ) DRUG-Lab Test Interaction 25
- ( ) ADR: Preventable 26
- ( ) ADR: Observed 27
- ( ) DRUG: Complex Administration 28
- ( ) DRUG: Other Specific Problem 29
- ( ) PATIENT: Over-Utilization of Drug 31
- ( ) PATIENT: Under-Utilization of Drug 32
- ( ) PATIENT: Communication Difficulty 33
- (X) PATIENT: Case Managed 34
- ( ) PATIENT Other Improper Use of Drug 35
- ( ) PATIENT Seeking Care: With Symptoms 41
- ( ) PATIENT Seeking Care: NO Symptoms 42
- ( ) OTHER NON-Drug Problems 90

ASEBP Plan Number: ( ) Plan 1 (X) Plan 2

COMMENTS Extensive counselling required - new asthmatic patient

Intervention:

- ( ) CONSULT Prescriber [phone/fax] 10
- ( ) CONSULT Prescriber [in-person] 11
- ( ) CONSULT RPh at another Pharmacy 20
- ( ) CONSULT Patient 30
- ( ) PATIENT Assessment 31
- (X) PATIENT Training 32
- ( ) REVIEW Profile or Chart 50
- ( ) REVIEW Laboratory Tests 51
- ( ) REVIEW Literature 60
- ( ) OTHER 80

Result:

- ( ) CHANGE To Drug of Choice 01
- ( ) ADD Rx Drug Therapy 02
- ( ) SUBSTITUTION: Therapeutic 03
- ( ) ADD OTC Drug Therapy 04
- ( ) CHANGE Dose 11
- ( ) CHANGE Dosage Regimen/Duration of Use 12
- ( ) CHANGE Dosage Form 13
- ( ) DISCONTINUE Drug 21
- ( ) DO NOT Dispense 22
- ( ) DISPENSE Trial Prescription 23
- (X) COUNSEL Patient 30
- ( ) REFERRAL 40
- ( ) DISPENSE As Written 90

Effect on Long Term Disability Status:
( ) Yes ( ) No (X) Unknown

CODE: 34.32.30

PIER PROJECT CLAIM/INTERVENTION FORM REVISED 950727

182

Reimbursement: 1 distribution fee ($5.50) + 2 consulting fees ($17.00) = $22.50

APPENDIX D: Sample Project Newsletter

Please share with all pharmacists

P.I.E.R. PROJECT NEWSLETTER

Newsletter For Participating Pharmacists

November 21, 1996

PROJECT EXTENSION

A confirmation about extending the PIER project has not been received from ASEBP, however, pharmacists should continue to submit PIER claims until further notice.

SELECTED PIER RESULTS AFTER 1 YEAR

- mean claim time = 9.68 minutes
- total number of pharmacies with 1 or more claims = 44
- total number of pharmacists with 1 or more claims = 57
- the average drug plan savings per claim are $6 - $7

- Top 3 problems:

Problem (code #)	% of claims
- suboptimal dose (02)	16
- drug/other specific problem (29)	15
- drug/allergy intolerance (23)	11

- Top 3 interventions

- consult prescriber (10 + 11)	65
- consult patient (30)	18
- patient training (32)	11

- Top 3 results

- change dose (11)	23
- counsel patient (30)	20
- dispense as written (90)	14

- Top 3 claim codes

- sub-optimal dose/consult prescriber/change dose (02 10 11)	13
- drug allergy intolerance/consult prescriber/change to drug of choice (23 10 01)	6
- patient under utilization/consult prescriber/counsel patient (32 30 30)	4

Please share with all pharmacists

P.I.E.R. PROJECT NEWSLETTER

Newsletter For Participating Pharmacists

November 21, 1996

EXAMPLES OF ACTUAL PIER CLAIMS SUBMITTED

Example (1): A 56 year old patient came for a refill of ranitidine. The pharmacist noted on the patient profile that the patient was also receiving Ultradol 300 mg bid; the patient complained that the ranitidine was not controlling the symptoms described as heartburn. The pharmacist contacted the prescriber and suggested adding Cytotec to the drug regimen. The problem 29: Other Specific Problem, the intervention was 10: CONSULT Prescriber, and the result 23: Dispense Trail Prescription.

Example (2): A patient presented with a prescription for cephalexin. Upon questioning the patient the pharmacist determined that the patient had experienced a severe allergic reaction to the same drug just eight months earlier. The pharmacist consulted the physician and had the prescription changed to sulfatrim. The problem 23: DRUG-Allergy/Intolerance, the intervention 10: CONSULT Prescriber, and the result 01: CHANGE To Drug of Choice.

Example (3): A 49 year old patient presented with a new prescription for a salbutamol inhaler. The patient had not used an inhaler before, and the pharmacist spent a considerable amount of time teaching the patient how to obtain the maximum benefit from its use. The problem 90: OTHER NON-Drug Problems, the intervention 32: PATIENT Training, and the result 30: COUNSEL Patient.

P.I.E.R. PROJECT CLAIM/INTERVENTION FORM

SITE ID_____ Identification#_____ Date_____ Rx#_____ RPh ID_____ InIT_____ Time (Min.)___

ORIGINAL Rx INFORMATION			DISPENSED Rx INFORMATION		
DIN:	QTY:	DAYS SUPPLY:	DIN:	QTY:	DAYS SUPPLY:

Problem:

- ☐SUBOPTIMAL Drug 01
- ☐SUBOPTIMAL Dose 02
- ☐SUBOPTIMAL Dosage Regimen 03
- ☐SUBOPTIMAL Dosage Form/Route of Admin. 04
- ☐SUBOPTIMAL Duration of Use 05
- ☐SUBOPTIMAL: Unnecessary Drug Therapy 06
- ☐DRUG: Therapeutic Duplication 11
- ☐DRUG-Drug Interaction 21
- ☐DRUG-Disease Interaction 22
- ☐DRUG-Allergy/Intolerance 23
- ☐DRUG-Food Interaction 24
- ☐DRUG-Lab Test Interaction 25
- ☐ADR: Preventable 26
- ☐ADR: Observed 27
- ☐DRUG: Complex Administration 28
- ☐DRUG: Other Specific Problem 29
- ☐PATIENT: Over-Utilization of Drug 31
- ☐PATIENT: Under-Utilization of Drug 32
- ☐PATIENT: Communication Difficulty 33
- ☐PATIENT: Case Managed 34
- ☐PATIENT:Other Improper Use of Drug 35
- ☐PATIENT Seeking Care: With Symptoms 41
- ☐PATIENT Seeking Care: NO Symptoms 42
- ☐OTHER NON-Drug Problems 90

ASEBP Plan Number: ☐Plan 1 ☐Plan 2

COMMENTS _____

_____

_____

Intervention:

- ☐CONSULT Prescriber [phone/fax] 10
- ☐CONSULT Prescriber [in-person] 11
- ☐CONSULT RPh at another Pharmacy 20
- ☐CONSULT Patient 30
- ☐PATIENT Assessment 31
- ☐PATIENT Training 32
- ☐REVIEW Profile or Chart 50
- ☐REVIEW Laboratory Tests 51
- ☐REVIEW Literature 60
- ☐OTHER 80

Result:

- ☐CHANGE To Drug of Choice 01
- ☐ADD Rx Drug Therapy 02
- ☐SUBSTITUTION: Therapeutic 03
- ☐ADD OTC Drug Therapy 04
- ☐CHANGE Dose 11
- ☐CHANGE Dosage Regimen/Duration of Use 12
- ☐CHANGE Dosage Form 13
- ☐DISCONTINUE Drug 21
- ☐DO NOT Dispense 22
- ☐DISPENSE Trial Prescription 23
- ☐COUNSEL Patient 30
- ☐REFERRAL 40
- ☐DISPENSE As Written 90

Effect on Long Term Disability Status:
☐Yes ☐No ☐Unknown

CODE#: __ __- __ __ -__ __

PIER PROJECT CLAIM/INTERVENTION FORM REVISED 960621

APPENDIX F: PIER Pharmacist Cognitive Service Definitions

DEFINITIONS FOR COGNITIVE SERVICE ELEMENTS

ADAPTED FROM: The Pharmacist CARE Project

Definitions for Cognitive Service Elements
Problem, Intervention, and Result

PROBLEM
Non-optimal prescribing:

01 Suboptimal Drug	Inappropriate, incorrect, or less than optimal drug prescribed for the patient's condition based upon standard drug therapy recommendations, formulary restrictions. (e.g. A broad spectrum cephalosporin prescribed for an ear infection when an alternative such as amoxicillin has not been tried which is both appropriate and less expensive.) This problem category does not include problem categories 21-29 listed below.
02 Suboptimal Dose	Inappropriate, incorrect, or less than optimal dose of drug prescribed for the patient's condition. (e.g. Dose is too high or too low when evaluated against clinically recommended amount).
03 Suboptimal Dosage Regimen	Inappropriate, incorrect, or less than optimal dosage regimen ordered for the drug prescribed. (e.g. Drug is prescribed to be taken twice daily when usual therapy is three times daily for appropriate therapeutic effect.)
04 Suboptimal Dosage Form	Inappropriate, incorrect or less than optimal drug dosage form for the patient. (e.g. Capsules for infants or colostomy patients).
05 Suboptimal Duration of Use	Drug prescribed for inappropriate or less than optimal length of time. (e.g. Duration of therapy is too long or too short).
06 Suboptimal: Unnecessary Drug Therapy	Drug prescribed is not needed by the patient based on the problem or diagnosis presented. (No drug is needed.)

Drug-Specific Problems:

11 Drug: Therapeutic Duplication	Drug prescribed when the patient is already taking a therapeutically equivalent drug. (e.g. Patient is prescribed a drug which is an H2 antagonist when already taking an H2 antagonist).

21 Drug-Drug Interaction	Interaction that requires communication with prescriber and patient counselling due to severity of drug-drug interaction. (e.g. Class I interaction as categorized by Hansten/Horn Drug Interactions and Updates).
22 Drug-Disease Interaction	Drug prescribed causes adverse effect on disease, or disease causes ineffective or adverse effect of drug. (e.g. A beta-antagonist is prescribed for an asthmatic patient).
23 Drug Allergy/ Intolerance	Patient allergic to drug prescribed or has intolerance to the drug that will cause non-compliance of drug therapy [suspected or definite]. (e.g. Patient prescribed a sulfonamide antibiotic when allergic to sulfa).
24 Drug-Food Interaction	Drug prescribed has adverse interaction with food prescribed for patient. (e.g. Patient taking a calcium supplement is prescribed a tetracycline drug).
25 Drug-Lab test Interaction	Drug prescribed known to interact with a home or office lab test. (e.g. Patient prescribed a salicylate drug which may cause false-positive glucosuria when using a copper reduction method to test urine glucose).
26 ADR: Preventable	Drug prescribed is known or suspected to cause an adverse drug reaction (ADR) for the patient. (e.g. Patient reports to pharmacist previous hospitalization due to reaction to penicillin and is prescribed penicillin).
27 ADR: Observed	Pharmacist observes or suspects the patient is experiencing an adverse drug reaction (ADR). (e.g. Patient taking a tricyclic antidepressant and pharmacist observes "pill rolling" action, nervous feet and/or hip motion which are extra-pyramidal symptoms, ADR's of the drug.)
28 Drug: Complex Administration	Drug prescribed has complex usage instructions or administration procedure requiring additional patient education for appropriate use. (e.g. Use of Imitrex, technique for giving insulin injections, proper use of Metered-Dose Inhaler).
29 Drug: Other Specific Problem	Use for any drug problems not previously described and not specifically excluded as noted in the documentation procedure instructions. **(e.g. Activities that should NOT be documented include missing information on a prescription, forged prescriptions).**

Patient-Specific Problems:

31 Patient Over-Utilization of Drug	Patient over-compliance with drug therapy. (e.g. Early refill as determined by records of directions and quantity dispensed, when prescription was last dispensed, and calculation made by the pharmacist to determine when the patient should need more medication to control health problem).
32 Patient Under-Utilization of Drug	Patient under-compliance with drug therapy. (e.g. Late refill as determined by records of directions and quantity dispensed, when prescription was last dispensed, and calculation made by the pharmacist to determine when the patient should need more medication to control health problem).
33 Patient Communication Difficulty	Patient who has difficulty comprehending instructions for taking drug therapy. (e.g. English is not the native language, deaf, mental impairment).
34 Patient Case Managed	Patient (case) is referred to a pharmacy by a physician or payer for management of the patient's drug therapy through a customized care program developed between the pharmacy and the provider. (e.g. A patient who has a history of drug abuse whom a prescriber or payer makes an agreement with a pharmacy to monitor the patient's drug use). This does NOT include patients who are restricted to a pharmacy by the payer. Also, this is NOT the same as a managed care patient).
35 Patient: Other Improper Use of Drug	Inappropriate use of a drug other than over or under utilization of a drug. (e.g. Applying a nitroglycerin patch for 24 hours without a nitrate-free period which can cause the patient to become tolerant to the effect of the drug).

Patient Seeking Care:

41 Patient Seeking Care: With Symptoms	Patient seeking advice and care for specific symptoms related to drug therapy or for which drug therapy is likely to be needed. (e.g. A patient requests advice about stomach pain, earache, rash).
42 Patient Seeking Care: NO Symptoms	Patient seeking advice and care to maintain health; has no disease symptoms. (e.g. A patient requests advice that will promote health or prevent disease).

90 Other Non-Drug Problems	Use for other NON-drug related problems that require the pharmacist's cognitive services. (Any non-drug related problem that does NOT include problem category 42).

INTERVENTION

10 Consult Prescriber Phone/Fax	Prescriber contacted by phone or fax by the pharmacist to obtain information, to resolve a drug therapy problem or to make an appointment or referral for a patient.
11 Consult Prescriber In-Person	Prescriber contacted in-person by the pharmacist to obtain information, to resolve a drug therapy problem or to make an appointment or referral for a patient. This also includes circumstances in which the pharmacist provides a written consultatio letter to the prescriber.
20 Consult B.Sc.Pharm at Other Pharmacy	Pharmacist detecting a drug therapy related problem consults a pharmacist from another pharmacy about the patient's drug-related problem.
30 Consult Patient	Patient interviewed to obtain more information about disease, drugs currently taken, or problem detected as it relates to drug therapy.
31 Patient Assessment	Pharmacist assesses patient regarding health condition as it is related to the patient's drug therapy through interview and/or reviewing routine vital signs. (e.g. An assessment of anti-hypertensive drug therapy by taking the patient's blood pressure).
32 Patient Training	Training and education for the patient beyond routine counselling laws. (e.g. Extended training or education provided so the patient appropriately uses or monitors drug therapy or disease).
50 Review Profile or Chart	Patient profile or chart reviewed to obtain information about patient's disease, current and previous drug therapy, allergies, lab values, or any other information pertinent to the drug therapy problem identified.
51 Review Laboratory Tests	Obtain and review laboratory tests or monitoring tests to assess the patient's disease and drug levels in bodily fluids that relate to drug therapy. (e.g. Use of blood glucose monitors, cholesterol screening, obtaining laboratory blood chemistries, cell counts, drug levels in lab blood draws, urine, tissue, culture and sensitivity tests).

NEW PAGE 21 - ADDENDUM

60 Review Literature	Consult literature and/or drug information sources to evaluated regarding drug therapy problem presented. (e.g. Consult Facts and Comparisons to verify drug-lab test interaction).
80 Other	Indicated for any intervention not previously described and related to drug therapy. (e.g. Third party payer consulted regarding an agreement to provide case management for a patient. This does NOT include patients restricted to a specific pharmacy by the payer. Also, this does NOT include any contact regarding drugs on a prior authorization list).

RESULT

01 Change to Drug of Choice	Drug changed and dispensed with prescriber's authorization. (e.g. Drug changed to one determined to be more appropriate for the patient's conditions).
02 Add Rx Drug Therapy	A legend or non-legend drug is prescribed by an authorized prescriber and added to the patient's therapy. (e.g. As a result of insufficient drug therapy for a patient's condition).
03 Substitution: Therapeutic	A therapeutically equivalent drug dispensed with prescriber authorization. (e.g. An alternative cephalosporin is dispensed that is therapeutically equivalent to the cephalosporin that was originally prescribed).
04 Add OTC Drug Therapy	Pharmacist recommends OTC drug therapy for the patient based upon the symptoms and problem presented. (Indicate only for OTC drugs NOT covered as a drug benefit through the payer when prescribed by a physician. i.e. use code 02.)
11 Change Dose	Drug dose changed with prescriber authorization due to inappropriate or incorrect dose prescribed. (e.g. Original dose was too low to obtain desired therapeutic effect so was increased to achieve appropriate drug therapy).

12 Change Dosage Regimen	Dosage regimen changed with prescriber authorization due to inappropriate or incorrect dosage regimen prescribed. (e.g. Drug dose changed from twice daily to three times daily to achieve appropriate therapeutic effect).
21 Discontinue Drug	A drug currently taken by the patient is discontinued with prescriber authorization. (e.g. Pharmacist identifies that patient currently is taking an H2 antagonist and is prescribed a second H2 antagonist so discontinues previous drug with prescriber's authorization).
22 DO NOT Dispense	Drug prescribed is not dispensed upon contact with prescriber and authorization. (i.e. Pharmacist identifies that patient began taking a broad spectrum antibiotic two days ago and is prescribed a second antibiotic; upon consulting with the physician, it is determined the second antibiotic is unnecessary so it is not dispensed).
23 Trial Prescription	The drug is given for a seven day period to assess whether the patient will experience adverse effects or intolerance of the drug. If there is a drug-related problem (DRP), the balance is not dispensed. If there is NOT a DRP, the balance of the prescription is dispensed. (e.g. used with drugs with a high incidence of side effects such as NSAID's).
30 Counsel Patient	Extended patient counselling provided due to a patient's drug-related problem. (e.g. The pharmacist determines this is needed to assure patient understanding and compliance over and above counselling required by law). This also includes circumstances when a pharmacist provides a written consultation or information sheet.
40 Referral	Referral of a patient to a provider is a means by which responsibility of care is transferred from one authorized provider to another with each being aware of the transfer. A referral involves pharmacists recommending the patient contact a provider to whom the referral has been made. (e.g. This includes referral to a health care provider for language translation to assure patient understanding of use and purpose of medication of device for drug therapy). This does not include a verbal referral only, which is considered patient counselling.
90 Dispense as Written	Drug dispensed as written. (e.g. The prescriber does not authorize a change in drug therapy when contacted about a drug problem, or upon contact with the prescriber a potential drug therapy problem is ruled out).

APPENDIX G: Summary Results from Pharmacist Surveys and Interviews Extracted from October 30, 1996 Interim Report

Fax Survey

In February 1996, a one-page fax-back survey was sent to a contact pharmacist in each participating pharmacy. The survey was designed to identify possible factors for the lower-than-expected claim rate. Written responses were received from 23 pharmacists and additional verbal comments were received from five pharmacists. Representative feedback is summarized below.

- Many pharmacists indicated undertaking concerted attempts and efforts to find drug-related problems. Several pharmacists indicated a major frustration in the lack of problems detected.
- Two of three pharmacists reported fewer opportunities to perform pharmacist interventions for ASEBP clients due to the small number of prescriptions dispensed, the younger client base, and the higher client education level.
- Because of the practice of charging more than ASEBP's capped fee, half of the pharmacies reported reduced volumes of ASEBP prescriptions.
- Half the pharmacists experienced difficulties differentiating routine and value-added interventions.
- Two of three pharmacists indicated that interventions were carried out but were not reported.
- Half the pharmacists were not sure if interventions were documented.

Telephone Interviews

An open-ended question telephone interview was conducted with a contact at each site in April and May of 1996 to collect questions, concerns, issues or suggestions of where changes could be made to improve participation. A further question was asked about suggestions for the best mechanism for reminding pharmacists about the project. The following were some of the common themes from pharmacist feedback.

- there is need for a computerized flagging system to identify ASEBP clients
- the control group has no incentive to participate
- documentation is not part of the daily routine
- pharmacists do not know or remember about the project because ASEBP clients do not comprise a large number of clients in most pharmacies
- there is either a lack of opportunity or inability to perform interventions in the study group because ASEBP clients are younger, healthier, and more educated

APPENDIX H: Pharmacist Telephone Survey

PIER PROJECT TELEPHONE SURVEY

SECTION I: PRACTICE PROFILE

In the first part of the interview I'd like to ask you some questions that will help us understand the pharmacy practice environment. Please ask me to repeat any question or to clarify it if my wording isn't clear. All of the questions apply to _____ Should you work at other pharmacies, please don't consider them when you answer the questions. Are you ready to start?

I.1 Using the month of January as a standard, approximately how many hours per week do you work in this pharmacy?

Response:_____

I.2 Approximately how many prescriptions do you personally fill per week in this pharmacy?

Response: _____

I.3 Regardless of drug plan, on approximately what percentage of ALL prescriptions that you dispense in a week, do you perform interventions? These interventions could include consulting the prescribing physician, special patient education, consulting other health care professionals, or any other activity classified as an intervention on the PIER claim form.

Response:_____

[If they ask, these do not necessarily have to be "value-added" interventions that were discussed during the PIER Project training sessions. Here we want to capture every "intervention" a pharmacist makes--every time they discuss something with the prescriber, spend longer than normal with a client etc. But these are only PRESCRIPTION interventions, OTC are not included.]

I.4 I will read four categories of work activities and then define them. Please estimate what percentage of your working time is spent doing each of these activities. They should add up to 100 percent. The four categories are dispensing-related activities, consultative activities, OTC related activities, and other activities. Now I will explain what I mean by each of the categories. The first, dispensing- related activities, includes the actual processing or filling of prescriptions, maintaining prescription drug inventory, and processing third party claims. The second category, consultative activities, includes patient counselling about prescription drugs and consultations with other health care professionals. The consultative activities represent the clinical activities that you perform as a pharmacist. The third category, OTC or self care related activities, includes counselling patients on product selection and/or correct use, and maintaining non-prescription drug inventory. The fourth category is for other activities not included above, including administrative and

supervisory tasks. Please estimate the time you spend doing each of them. If you would like please ask me to repeat any categories and definitions.

Dispensing-related activities..... _____
Consultative activities..... _____
OTC related activities..... _____
Other activities (management)..... _____

1.5 What percentage of your working time at this pharmacy is spent with a technician?

Response:_____

1.6 What percentage of your working time at this pharmacy is spent with other pharmacists?

Response:_____

1.7 Do you have any comments about anything that I've asked you so far?

SECTION II: OBSTACLES TO THE PIER PROJECT

For the next few questions I will ask you to answer some questions with a rating scale, but please feel free to make additional comments. For other questions I will ask you to respond in your own words. The next few questions refer to the definitions developed for the PIER Project and listed on the PIER claim form, specifically the definitions in the categories of "problem", "intervention", and "results". For the next question please rate your answer on a scale of 1 to 5, where 1 is very unclear and 5 is very clear.

2.1 Were the definitions of the categories of "problems" listed on the PIER form clear?

Response:_____

2.2 [If any response but "five"] Which problems were particularly unclear?

2.3 For the next question, please rate your answer on a scale of 1 to 5, where 1 is very unclear and 5 is very clear. Were the definitions of the categories of "interventions" listed on the PIER form clear?

Response:_____

2.4 [If any response but "five"] Which interventions were particularly unclear?

2.5 For the next question, please rate your answer on a scale of 1 to 5, where 1 is very unclear and 5 is very clear. Were the definitions of the categories of "results" listed on the PIER form clear?

Response:_____

2.6 [If any response but "five"] Which "results" were particularly unclear?

2.7 For the next question please rate your answer on a scale of 1 to 5, where 1 is very easy and 5 is very difficult. How easy was it to complete the PIER form?

Response:_____

2.8 What made the completion of the documentation forms easy or difficult?

2.9 If the PIER claim documentation was electronic do you think you would submit more claims? The responses are yes, no, or don't know

YES.....1
NO.....2
DONT KNOW.....3

2.10 How could we have designed the PIER project to make documentation of these interventions easier for you?

2.11 Did you attend one of the official PIER Project training sessions offered during the summer of 1995?

YES.....1
NO.....2
DONT KNOW.....3

2.12 [If YES above] How would you rate the training on documentation during the orientation program using a scale from 1 to 5 where 1 is completely inadequate and 5 is very comprehensive?

Response:_____

2.13 Did you have access to a PIER Project training and reference manual?

YES.....1
NO.....2
DONT KNOW.....3

2.14 [If YES above] Please indicate which of the following sections of the manual that you read:
[Tick if YES]

Introduction.....____
Documentation Requirements.....____
Reimbursement Details.....____
Case Studies and Example Forms.....____

2.15 How helpful was the PIER training manual in terms of helping to fill in the claim forms, using a scale from 1 to 5 where 1 is of no help and 5 is extremely helpful?

Response:_____

2.16 How helpful were the regular newsletters in terms of motivating you to fill in the claim forms, using a scale from 1 to 5 where 1 is of no effect and 5 is extremely motivating?

Response:_____

2.17 When did you usually complete the documentation for the PIER claim forms?

Immediately when the intervention was made.....1
At the first convenient break.....2
At the end of your shift.....3
Other (please specify).....4
Did no documentation.....5

2.18 Do you have any other comments about the PIER project structure?

2.19 Please identify strengths and weaknesses about the way the project was structured.

SECTION III: PIER PROJECT IMPACT ASSESSMENT

3.1 How much did your participation in the PIER project increase your awareness of alternative reimbursement strategies for pharmacy? The answers are:

Not at all.....1
Small amount.....2
Significant amount.....3
Large amount.....4

3.2 Which PIER Project reimbursement group were you in?

Group A.....1
Group B.....2
Group C.....3
Don't Know.....4

3.3 For the following question, please respond using the four point scale that I will read at the end of the question. To what extend did your being in this reimbursement group influence you to do interventions?

Not at all.....1
Small amount.....2
Significant amount.....3
Large amount.....4

To what extend did your being in this reimbursement group influence you to document interventions?

Not at all.....1
Small amount.....2
Significant amount.....3
Large amount.....4

3.4 Had you been in a different reimbursement group would it have altered your participation in the PIER Project?

3.5 Please estimate what proportion of the interventions you made for ASEBP clients in January that were not documented and submitted on PIER claim forms.

Response:_____

3 6 One of the PIER reimbursement groups had all the fee paid directly to the pharmacy. If your salary merit pay increments were tied to the number of interventions you documented would you complete more PIER claim forms? Please respond using the following scale:

NOT AT ALL.....1
SOMEWHAT.....2
SIGNIFICANT AMOUNT.....3
LARGE AMOUNT.....4
DONT KNOW.....5

3 7 One of the PIER reimbursement groups had a portion of the fee paid directly to the pharmacist. If the reimbursement to the **pharmacist** was greater would you complete more PIER claim forms? Please respond using the following scale:

NOT AT ALL.....1
SOMEWHAT.....2
SIGNIFICANT AMOUNT.....3
LARGE AMOUNT.....4
DONT KNOW.....5

3.7.1 [If any but NOT AT ALL] How much reimbursement would be adequate to make it worth your while to complete more PIER claim forms?

Response:_____

3 8 To what extent did the PIER Project cause you to **perform more interventions** on prescriptions? Please rate your answer on a scale of 1 to 5 where 1 is not at all and 5 is completely

Response:_____

3 8.1 Do you have any comments on that question?

3.9 To what extent did the PIER Project encourage you to **document** more of the interventions that you were performing? Please rate your answer on a scale of 1 to 5 where 1 is not at all and 5 is completely.

Response:_____

3.9.1 Do you have any comments on that question?

3.10 To what extent did the PIER Project encourage you to **spend longer** on a prescription intervention? Please rate your answer on a scale of 1 to 5 where 1 is not at all and 5 is completely.

Response:_____

3.10.1 Do you have any comments on that question?

3.11 To what extent did the PIER Project categories influence you to look for certain problems? Please rate your answer on a scale of 1 to 5 where 1 is not at all and 5 is completely.

Response:_____

3.11.1 Do you have any comments on that question?

3.12 To what extent did the PIER Project change your behaviour from dispensing to non-dispensing or consultative activities? Please rate your answer on a scale of 1 to 5 where 1 is not at all and 5 is completely.

Response:_____

3.13 To what extent do you find the PIER Project reimbursement scheme a more equitable form of reimbursement than the traditional fee-per-prescription dispensing fee? Please rate your answer on a scale of 1 to 5 where 1 is not at all and 5 is completely.

Response:_____

3.13.1 Do you have any comments on that question?

3.13.2 Do you have any comments on alternative reimbursement in general?

3.14 Did you personally get paid or receive a benefit for submitting PIER claim forms?

3.15 What general comments do you have to make about the impact that the PIER project had on your practice?

SECTION IV: UNDERSTANDING OF THE PIER PROJECT

4.1 In your own words please tell me what you feel the goals of the PIER Project were.

4.2 I will now read a list of several small scenarios. For each of them, please tell me whether you consider these to be services provided by pharmacists that are "value-added". The scenarios may or may not be for ASEBP clients, but please define them as value-added or not.

4.2.1 A prescription for Arthrotec was written with a qid dosing regimen. the maximum recommended dose is tid. The pharmacist calls the physician and has the order changed.

Value Added.....1
Not Value Added.....2
Other (Specify).....3

4.2.2 A patient asks a pharmacist to call the physician for a refill, as the current prescription has no refills left. The pharmacist calls the physician and gets a new prescription.

Value Added.....1
Not Value Added.....2
Other (Specify).....3

4.2.3 A young patient receives a prescription for an inhaler with an aerochamber device. The pharmacist spends a full ten minutes teaching the patient how to use the inhaler appropriately.

Value Added.....1
Not Value Added.....2
Other (Specify).....3

4.2.4 A pharmacist provides counselling on the correct use of a tetracycline prescription written for an acute infection.

Value Added..... 1
Not Value Added..... 2
Other (Specify)..... 3

4.2.5 A patient receives a prescription for a drug not yet on the Blue Cross Drug Benefit List. The pharmacist calls Blue Cross and gets the name of an alternative drug that is covered, and then calls the prescribing physician for a new prescription.

Value Added..... 1
Not Value Added..... 2
Other (Specify)..... 3

4.3 Do you have any other comments about any aspect of the PIER Project?

That was the last question. Thank you very much for your time. When we have completed the interviews and tabulated the results, we will be posting them as a part of the PIER newsletter.

Finally, would you be willing to participate in a written survey in the future? This survey will determine how some events affect you personally. Again, all information will be handled confidentially.

Response:_____

Thank you very much for your time.

REVISED FEBRUARY 16, 1997
DRAFT: survv10.wpd

APPENDIX I: Samples of Pharmacists' Responses to Open-Ended Questions

Section II: Obstacles to the PIER Project

Questions 2.2, 2.4 and 2.6

Problem Definition	▸ "There are too many [categories]. It could fall under many categories." ▸ "Such a big list. Vague categories."
Intervention Definitions	▸ "Standards of practice say we must do certain interventions. Some interventions seem like they are in our scope of practice, therefore it was confusing that they were classified as interventions in the PIER form." ▸ "PIER came out when standards of practice came out. It [Standards of Practice] was comprehensive, so it left little for interpretation and I thought I couldn't do any interventions. Everything was covered by the standards."
Result Definitions	▸ "Missing some. More specific categories required.

Question 2.8 – Ease of Documentation Form

- "Easy because of check-boxes."
- "Deciding which problem to use, fitting it into a category. Some category definitions overlap."
- "Easy because it was well laid out. Hard because lack of time."

Question 2.10 – How could documentation be made easier?

- "With changing work patterns to computer, it is really disruptive going to paper documents. Also, it is way faster if using a computer as a tool. Documenting on paper is just too slow."

- "Hard to tell. Depends on how difficult to process the claim. May take too much time."
- "Documentation is tough to do period. Has to be done and there is no measure of workload in community pharmacy practice."
- "The problem was remembering whether the patient was on that plan."
- "Electronic. Pushing a button is easier than getting forms."

Question 2.15 – Training manual components

- "It differentiated a lot of things. Good examples, it was needed to make things work."
- "The case studies helped a lot."
- "Trouble finding things in the manual."
- "The training sessions made the manual very clear. The manual on its own was not that clear."

Question 2.16 – Newsletter comments

- "We wanted more frequent newsletters—monthly or so. Gets you motivated."
- "More vigilant as they come, but enthusiasm wore off with time."
- "We were shocked to see some of the examples. We wouldn't consider some stuff out of the normal so we wouldn't have documented it."
- "Should tell us who is leading in pharmacy. Need competition."

Section III: PIER Project Impact Assessment
Questions 3.8, 3.9.1, 3.10.1, and 3.11.1

Interventions	▸ "If it was an intervention in the best interest of the patient I still do it." ▸ "I would have done them naturally. I do them anyway. And the project didn't affect performance." ▸ "Just because you are in a project doesn't mean you can't do it for other patients. It's part of my job."
Documentation	▸ "Project had no effect. We have a sheet that we used all along to document interventions." ▸ "We realize the need to document but doing it is a barrier." ▸ "PIER made me more conscious that we have to document. There are still time and money factors in the way." ▸ "We don't need more paperwork. It just adds more pressure."
Time	▸ "We do what it takes to get the problem solved. The only extra time is filling in forms. Everything else is the same." ▸ "With every intervention, only spend the amount of time required. Boils down to patient care." ▸ "Depending on the intervention, what it consists of, depends on the time you spend. And the seriousness of the problem."
Problems	▸ "That's my job. I do it all the time." ▸ "Did not change how we do things in the pharmacy. ▸ "Lots of stuff I never would have considered interventions. Very good categories, well set out." ▸ "Having everything laid out on paper, you understand what you are looking for."

Question 3.15 – General impact on practice

- "No impact because we were not reimbursed. Because we don't get money for interventions, we did not document the intervention."
- "No impact. Might have more awareness in pharmacies—some things we had been taking for granted."
- "More aware that we have to document."
- "Real world—never have time to document."
- "I was happy with the CEUs from going to the initial training. It hasn't changed the perspective of interventions: we always intervene."
- "None. It was interesting to read about the project. I feel good in terms of the larger profession. There was no impact on what I do and how."
- "Not much impact because patients that came in [ASEBP] didn't have too many interventions."
- "It tended to make you more aware of us selling our services to let us be reimbursed."

APPENDIX J: Selection of Reimbursement Model and Modified Weighted Payment Schedule

Community pharmacy reimbursement models were reviewed in the fall of 1994. Two criteria were used to create a short list of models for further study. The first was that the model had to be appropriate for large-scale use in community pharmacy, and the second, the model must be in use or available for immediate field-testing. Four major systems met the criteria. These were the Quebec Pharmaceutical Opinion program, the Washington State Pharmacist CARE (Cognitive Activities and Reimbursement Effectiveness), PAID Prescriptions Coordinated Health Network, and a Virginia Community Pharmacy Capitation model. Three of the reimbursement models were fee-for-service and one, a capitation model. A group of 40 key Alberta pharmacy opinion leaders were invited by APEC to participate in a strategic planning workshop for new pharmacy payment models. The participants identified the lease desirable characteristics of a future Alberta pharmacy reimbursement model. The most desirable characteristics identified by the group were a health outcome focus and the separation of cognitive services and products. Preference was unanimous among participants for an unbundled payment model for cognitive services and dispensing services. There was no consensus on preferences for the following: fee-for-service or capitation, the direct linking of payment to process or outcomes, and whether direct payment should be made to the pharmacist versus the pharmacy. Participants concluded that the Quebec and Washington State systems most closely fit the desirable characteristics and could be implemented with the greatest ease. With minor modifications, both were worthy of pilot testing and further evaluation. Both models linked reimbursement directly to pharmacist

interventions. The Quebec model was Canadian and had been in use for over ten years. The Washington State model was simple to use, more comprehensive, and captured some outcomes information. Because of its simplicity and comprehensiveness, the Washington State model was selected for pilot testing. The Washington model comprised a set of definitions for pharmacist cognitive service elements from which the pharmacist classifies a professional cognitive service. The Washington model was a precursor to a national model developed for use in the United States by the National Association of Retail Druggists (now known as the National Community Pharmacists Association). Some minor adaptations were made to the definitions for Canadian use. The definitions were edited to reflect Canadian pharmacy regulatory terminology and two result codes were added: "do not dispense" and "trial prescription".

One limitation of the Washington model was the approach used to assign payment values to pharmacist cognitive service. In this model, payments were predicated on the amount of time required by the pharmacist to perform an intervention (input time) and estimated drug cost savings. Interventions of less than six minutes were eligible for $4, interventions of six minutes or greater $6.

Modified Weighted Payment Schedule

The principles used for the development of the PIER payment schedule are listed below. First, the payment schedule should be simple but not restricted to a single payment amount. Second, the payments should be sufficient to encourage pharmacists to perform and document cognitive activities. Finally, the payment schedule should be structured in a way that recognized the concept of value-added services.

An expert panel of practicing community pharmacists in Edmonton was created to

provide advice on the development of payment schedule for cognitive services. The committee identified three factors to establish weightings for the actual payment amount: (a) overall significance of the drug-related problem, (b) amount of time required by a pharmacist to conduct the intervention, and (c) significance of result.

Opinions for practicing community pharmacist about the relative importance of the commonly anticipated professional service codes were collected. A survey instrument was administered to pharmacist attending the 1995 APEC annual meeting. Respondents were asked to assign a weight of between zero to two for each billing code shown, where a zero implied that no payment was required for the code, one implied that the code was worth one unit, and two implied that the code was worth two units. A total of 54 responses were received. Pharmacists indicated clear preferences for the weighs on 28/45 codes (62%). For the remaining codes, the expert panel determined the weighting units.

A three level fee schedule was created where cognitive services were: (a) included within the customary dispensing or distribution fee, (b) worth one extra fee unit, or (c) worth two extra fee units. The plan's maximum dispensing fee of $8.50 was selected as the base value of one fee unit. Each of the problem, intervention and result type from the cognitive service definitions was assigned to one of the payment three levels; the overall weighting equaled the highest component value. The highest level of the three, determined the fee paid. Table J.1 summarizes the PIER fee schedule developed.

Table J.1 PIER Fee Schedule

Level of Cognitive Fee	Problem Code Number	Intervention Code Number	Result Code Number
No extra fee unit	03, 04, 21-22	10, 60	13 (when no compounding), 90
One extra fee unit ($8.50)	01, 02, 05-11, 23-32, 33 (if < 15 minutes), 34-90	20-31, 50-51, 80	01, 03-12, 13 (when compounding), 21-30, 40 (if referred to pharmacist)
Two extra fee units ($17.00)	33 (if > 15 minutes)	11, 32	02, 40 (if referred to other than pharmacist)

Note. The following six-digit codes were exceptions worth two extra fee units: 06/31/21, 06/31/22, 11/50/22

APPENDIX K: Examples of Detailed Billing Determinations

The following are some sample billing codes and the resulting values of professional fee. In the first example billing code 34/32/30 classifies the problem as #34 (patient case managed), the intervention as #32 (patient training), and the result as #30 (counsel patient). The fee schedule weighted problem #34 with one fee unit, intervention #32 with two fee units, and result #30 with one fee unit. The overall reimbursement weighting is based on the largest component fee weighting; 34/32/30 is eligible, therefore, for two fee units or $17 cognitive services fee.

Billing code is 26/10/23 (ADR-preventable/consult prescriber/trial prescription) is likewise weighted based on the largest component. Problem #26 is weighted at one unit, intervention #10 at zero units, and result #23 at one unit. The overall weighting is, therefore, one unit or $7.

In the third example, the problem, intervention and result values all appear in the no extra fee level. No extra fee is paid for the service. The fourth example 06/31/21 (suboptimal-unnecessary drug therapy/patient assessment/discontinue drug) is one of the six-digit codes specifically identified as being eligible for two extra fee levels or $17. The following table summarizes the example fee value determinations.

Table K.1 Sample Billing Code and Fee Value Determinations

Billing Code	Fee Value
34/32/30	Two units = $17.00
26/10/23	One unit = $8.50
04/10/90	No unit (s) = $0
06/31/21 (NB: exception 6 digit code)	Two units = $17.00