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**ANALYSIS OF THE IMPACT OF THE ALTERNATE FUNDING PLAN
AT THE HOSPITAL FOR SICK CHILDREN DEPARTMENT OF PAEDIATRICS**

by

Sandra G. Leggat

**A thesis submitted in conformity with the requirements for the
Degree of Doctor of Philosophy
Graduate Department of Community Health
University of Toronto**

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**Analysis Of The Impact Of The Alternate Funding Plan At The Hospital For Sick
Children Department Of Paediatrics**

**Degree of Doctor of Philosophy 1998, Sandra G. Leggat, Graduate Department of
Community Health, University of Toronto**

ABSTRACT

The purpose of this study was to review the impact of an alternate physician funding plan (AFP) in the Department of Paediatrics of The Hospital for Sick Children on the incentives and resulting behaviours of the physician members of the Department. The AFP was implemented in 1990, enabling analysis of the impact to fiscal year 1994/95. It was hypothesized that the establishment of the AFP would be associated with a decrease in clinical utilization, a change in the types of clinical services provided with more counselling and consultations and less diagnostic and therapeutic procedures, and an increase in the teaching and research activities of the Department members. It was also hypothesized that the participating paediatricians would express greater satisfaction with the AFP than with the previously existing fee-for-service arrangements. The study was completed with two research components; the first comprised quantitative analysis of physician clinical, teaching and research utilization at The Hospital for Sick Children (HSC). The research design consisted of an interrupted time series analysis. The study period was fiscal 1989/90 to 1994/95. To control for the effects of history the variables were measured during the study time periods for all paediatricians in the province of Ontario, as a non-equivalent, no treatment control. The second component of the study consisted of a satisfaction survey of all of the pediatricians involved in the AFP. The clinical utilization of the paediatrician members of the

Department of Paediatrics of the Hospital for Sick Children was not shown to be statistically significantly different from the clinical utilization of Ontario paediatricians during the study time frame. While there was a change in the type of services rendered by the HSC paediatricians during this period, the direction of the change was in the opposite direction from that hypothesized. The HSC paediatricians reported an increase in diagnostic and therapeutic procedures with concomitant decreases in assessment, hospital care and counselling procedures. There was evidence of increased teaching and research activity among the HSC paediatricians during the study time frame. Finally, while the satisfaction survey presented generally positive responses from the participating physicians regarding medical practice at the Hospital for Sick Children, the survey respondents did not generally report that the AFP had had a positive impact on their ability to complete their work at the Hospital for Sick Children. The analysis suggests that the AFP, as implemented in the Department of Paediatrics at The Hospital for Sick Children, did not directly change the financial incentives within the structure of physician practice and eliminated some of the feedback mechanisms necessary for ongoing monitoring and improvement of physician utilization. It is therefore not surprising to find that this alternate funding plan did not have a large impact on the behaviours and performance of the participating academic paediatricians.

ACKNOWLEDGEMENTS

The author is grateful for the guidance, encouragement and assistance of the members of the thesis committee, Dr. Peggy Leatt, Dr. Michael Murray, and Dr. Gene Vayda. Various individuals from the Hospital for Sick Children provided ongoing advice and support including, Dr. Robert Haslam, Neil Walker and Dr. Joe Clarke.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
ABSTRACT	ii
CHAPTER 1 INTRODUCTION	1
1.1 The Alternate Funding Plan At The Hospital For Sick Children Department of Paediatrics	4
1.2 Objectives of the Research	9
CHAPTER 2 THE ANALYTICAL FRAMEWORK	10
2.1 Environment Impacting the Health Care System	11
2.2 Objectives of the Health Care System	12
2.3 Structure of the Health Care System	13
2.3.1 Structure of the Academic Health Science Centre	20
2.4 Objectives of the Physician	21
2.5 Structure of Physician Practice	24
2.5.1 Changing Physician Practice Within Paediatrics	26
2.6 Physician Performance	27
CHAPTER 3 LITERATURE REVIEW: EMPIRICAL RESEARCH RELATING TO THE STUDY HYPOTHESES	29
3.1 Impact of the AFP on Clinical Utilization	30
3.2 Impact of the AFP on Teaching and Research Activity	39
3.3 Impact of the AFP on Physician Satisfaction	40
CHAPTER 4 RESEARCH METHODS	43
4.1 Research Design	43
4.2 Sample	46
4.3 Sources of Data	46
4.4 Study Variables	48
4.4.1 Dependent Variables	49
4.4.2 Independent Variables	51
CHAPTER 5 RESULTS	52
5.1 Impact of the AFP on Utilization of Physician Services	52
5.1.1 Total Clinical Utilization	52
5.1.2 Clinical Utilization by Service Type	62
5.1.3 Research Activity	66
5.1.4 Teaching Activity	67
5.2 Impact of the AFP on Physician Satisfaction	69
5.2.1 Demographics of the Survey Respondents	70
5.2.2 Analysis by Demographic Characteristics	72
5.3 Impact of the AFP on the Funding of the Department of Paediatrics	76

CHAPTER 6	DISCUSSION AND CONCLUSIONS	81
6.1	Test of the Hypotheses	81
6.1.1	Clinical Utilization	81
6.1.2	Teaching and Research Activity	89
6.1.3	Physician Satisfaction	91
6.2	Implications for Policy Makers	95
6.2.1	To Demonstrate Whether the Objectives of the AFP Have Been Achieved.	95
6.2.2	To Provide Accountability to Stakeholders	98
6.2.3	To Determine The Impact Of The AFP On The Mission(s) Of The Participating Organizations	101
CHAPTER 7	STUDY LIMITATIONS	103
7.1	Areas for Further Research	106
CHAPTER 8	REFERENCES	109
CHAPTER 9	APPENDICES	129
9.1	Glossary of Terms	129
9.2	The Hospital for Sick Children Department of Paediatrics Funding Agreement	133
9.3	Satisfaction Survey Questionnaire	145
9.4	Key to OHIP Procedure Codes	151
9.5	Categorization of OHIP Procedure Codes	154
9.6	Comparison of the Change in Volume by Procedure Category	155

CHAPTER 1 INTRODUCTION

The purpose of this study is to review the impact of an alternate physician funding plan on physician practice behaviour. Physicians, in providing diagnosis and treatment, have long been recognized as having influence on how care is delivered, patient satisfaction, resource utilization and the costs of health care delivery. Estimates of the amount of health care resources controlled by physicians range from between 50% to 80% of total health care costs (Eisenberg & Williams, 1981). Given this large amount of resource impact, health care systems must understand and influence physician behaviour to assist in achieving the goals of the health care system. “Doctors are not ‘naturally’ efficient: they need to be encouraged - to be given the right set of incentives - to be efficient” (Kristiansen and Mooney, 1993, p. 204). Reinhardt (1985) quoted Dr. Burns Roehrig, former president of the American Society of Internal Medicine, “if you change the incentives, with other things being equal, you’ll change physician behavior” (p.366). Enthoven (1978) suggested that physicians and other health professionals are motivated by nonfinancial goals, including a desire to cure the sick, to achieve professional excellence and the esteem of peers and the public, but their use of resources is inevitably also shaped by financial incentives.

This study focused on the establishment of an alternate funding plan (AFP) in the Department of Paediatrics at The Hospital for Sick Children in 1990, and the impact of this plan on the incentives and resulting behaviours of the physician members of the Department. This introductory chapter outlines the characteristics of the alternative funding plan and establishes the reasons for studying the implementation of this plan.

The next chapter outlines the analytical framework used to structure the analysis. The analytical framework builds upon a model developed by Hombrook and Berki (1985) that illustrates the relationships among system objectives, structure and performance.

Chapter three provides a review of the literature relevant to this study. The information gained through the review of the literature enabled the author to develop the study hypotheses. A number of changes in physician practice were hypothesized to be associated with the establishment of the alternate funding plan and the study was structured to determine whether the AFP was associated with changes in clinical utilization, teaching and research activities, and the level of physician satisfaction.

Chapter four presents the research methodology. The study was completed using two research components. The first comprised quantitative analysis of physician clinical utilization at The Hospital for Sick Children (HSC). The research design consisted of an interrupted time series analysis. To control for the effects of history the variables were measured during the study time periods for all paediatricians in the province of Ontario, as a non-equivalent, no treatment control.

The second component of the study consisted of a satisfaction survey of the pediatricians involved in the AFP. A satisfaction questionnaire was administered to all paediatrician members of the Department of Paediatrics. The quantitative data and survey results were analyzed to test the five study hypotheses.

Chapter five presents the study findings in detail, with discussion and conclusions included in Chapter six. The second section of Chapter six relates the findings to policy development in this area. The impact of the AFP is analyzed in relation to three themes. The themes are, achievement of the objectives of the AFP, provision of accountability to stakeholders, and the impact of the AFP on the mission(s) of the participating organizations. The final chapter, Chapter seven, details the limitations of this study and suggests areas for further research.

1.1 The Alternative Funding Plan At The Hospital For Sick Children Department of Paediatrics

The Hospital for Sick Children (HSC) is a tertiary/quaternary teaching and research hospital located in downtown Toronto. The Hospital has an international reputation for high quality paediatric care, teaching and research. Within HSC, the Department of Paediatrics functions as the University of Toronto (U of T) Department of Paediatrics and its department head is the Chair of the U of T Faculty of Medicine, Department of Paediatrics, as well as the Paediatrician-in-Chief of the Hospital, with reporting relationships to both the Dean of the Faculty of Medicine and the President and Chief Executive Officer (CEO) of HSC. There are 20 Clinical Divisions in the Department of Paediatrics and the Mission of the Department is to:

- provide leadership in basic, clinical and health outcomes research; and,
- educate medical students, postgraduate and subspecialty trainees and provide continuing education.

The ultimate goal of our endeavors in the Department of Paediatrics is to facilitate excellence in the health care of children. Health care is seen in the broadest sense, and thus includes: education/promotion, prevention, advocacy, health maintenance and treatment (Haslam 1995).

In 1993/94 The Hospital for Sick Children began the implementation of a new strategic vision, supporting general paediatrics in regional paediatric centres, with HSC maintaining its role as a specialized teaching, research and acute care hospital (Department of Paediatrics, 1993/94).

This new direction had been supported by the Hospital Restructuring Committee of the

Metropolitan Toronto District Health Council. All providers of paediatric services in the Greater Toronto Area would be connected through a child health network led by The Hospital for Sick Children. Although the new directions were communicated, the implementation of this model was only beginning as this study was completed.

Prior to and throughout the study period, HSC reported increasing levels of patient severity and complexity. This had an impact on the operations of the Department of Paediatrics as increasing patient complexity requires additional clinical resources, but also requires greater faculty time and supervision in the teaching programs.

In addition, changes in the medical education system had an impact on the Department of Paediatrics at HSC. The Department had lost approximately 25% of its Ministry of Health funded paediatric resident positions as a result of education cutbacks initiated in 1987 (Haslam 1995). These reductions, coupled with the previously described increasing patient severity and complexity, led the Department to look for ways to address the increasing costs of providing care to its paediatric population, while maintaining its teaching and research mission.

Prior to 1990, the members of the Department of Paediatrics billed the Ontario Health Insurance Plan (OHIP) fee-for-service for all medical services rendered. Currently the majority of physicians in Ontario, and in most provinces in Canada, are compensated on a fee-for-service (FFS) basis. This retrospective method of funding was continued with the establishment of universal, publicly funded health insurance in Canada, with each province developing and administering its own

schedule of fees for physician services (Abelson & Birch, 1993). In the 1964 Royal Commission Report on universal health insurance, Justice Hall specified that although other methods of remuneration may be appropriate in many situations, the fee-for-service principle should be used in Canada under universal medical care to ensure appropriate accountability (Canada, 1964). Under FFS, the physician provides a service from an approved list of services (fee schedule) and receives reimbursement from the provincial health insurance plan. Like many academic medical departments, the HSC Department of Paediatrics had a partnership practice plan, whereby the FFS revenue of all member physicians was pooled to cover Departmental expenses and to pay salaries of the physician members of the Department.

Primarily in response to the identified concerns about the level of funding, in April 1990, the Department of Paediatrics of The Hospital for Sick Children (HSC) implemented an alternative funding plan, a global budget method of reimbursement from the Ontario Ministry of Health for the activities of the Department members. This represented a shift from fee-for-service contributions to the Department's practice plan, which were paid out in the form of a guaranteed annual salary, to a level of funding which was adjusted for inflation with a negotiated annual salary for the members (Coyte, 1995). The goal of this funding arrangement was to enable the Department members to concentrate on research and teaching without having to ensure sufficient fee-for-service revenue from clinical practice to subsidize these activities (Haslam & Walker, 1993).

A salary payment system remunerates individuals based on a pre-determined income for a specific work schedule, and includes contract and sessional fee methods of compensation. The use of salary is most prevalent among hospital based physicians in countries such as West Germany, Italy, England, and France (Reinhardt, 1985). MacKenzie et al. indicated in 1993 that while only 9.5% of Canadian physicians reported receiving 90% or more of their income through salary, this form of payment had been growing steadily. The members of the Department of Paediatrics had always received their income through salary. However, the introduction of the AFP meant the paediatricians could abandon their existing service-driven mentality for FFS revenue to support the Department (Haslam & Walker, 1993).

The AFP was negotiated by the Ontario Ministry of Health, The Hospital for Sick Children, the Faculty of Medicine of the University of Toronto and the HSC Department of Paediatrics. The Hospital for Sick Children Department of Paediatrics Funding Agreement (the Agreement) is included in Appendix 9.2.

Although subsequent alternate funding agreements included clinical goals and objectives¹ this AFP Agreement focused primarily on the financial arrangements. The limited references to service

¹For example, the Clinical Goals and Obligations in the Agreement with the HSC surgeons, anaesthetists, and psychiatrists effective July 1, 1994 are:

5.1.2. The physicians shall deliver all insured physician services, or services substituted therefore in the HSC including those that now support the educational programs of the faculty of medicine. This does not preclude the appropriate use of other health care professionals to deliver these services.

5.1.3 The HSC agrees to maintain the programs that it is currently providing and acknowledges that planning for these programs should be conducted within a provincial and regional framework. The HSC has the right to be flexible in the provision of those programs and may adjust the content of those programs, patterns of program delivery, locations of programs, and types and numbers of individuals providing programs which are currently in place on the effective date of the Agreement.

expectations are found in Section 2:

The Department Physicians collectively carry out a unique and special combination of clinical, teaching and research activities for which special funding arrangements are appropriate.

In the Definitions:

“Department Services” means clinical, teaching and research activities (including related administrative activities) carried out by the Department Physicians, as members of the Department, in the premises of the Hospital, a related facility or the University.

The Agreement could be terminated by the Minister of Health if:

8.2.3 The Department Physicians are collectively tending to perform fewer clinical Department services, in favour of more clinical services in their private practices or more teaching, research or administrative activities, than they otherwise would but for the Ministry funding.

Thus, the Agreement only generally required the participating physicians to perform clinical services, teaching and research activities, with no specific definitions, goals, objectives or required outputs/outcomes for these Department services. The Agreement was to be in effect for 2 years at which time it would be evaluated and re-negotiated. At the end of the first year a 1-year extension was agreed to by all parties.

In April 1992, a 3-year extension of the original Agreement was accepted by all parties. An annual cost of living adjustment² was applied to the global fund through this negotiated extension. As of April 1998, no further revisions or negotiations to the Agreement have taken place.

This study examines the impact of this AFP on the clinical, research and teaching activities of the HSC Department of Paediatrics. The study objectives are presented in the next section.

1.2 Objectives of the Research

The objectives of the study are:

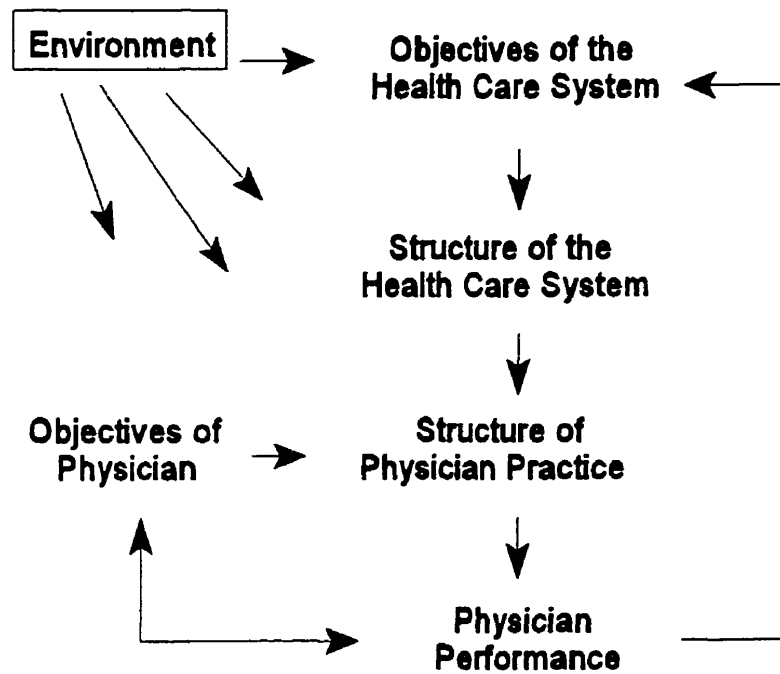
1. To examine the effect of the alternate funding plan at the Hospital for Sick Children, wherein the Department of Paediatrics received a global budget for academic, research, and clinical services as a replacement for the FFS billing income of the paediatricians, on the clinical activity of the participating paediatricians.
2. To examine the effect of the alternate funding plan at the Hospital for Sick Children on the research and teaching activities of the participating physicians.
3. To examine the effect of the alternate funding plan at the Hospital for Sick Children on physician satisfaction.

²The cost of living adjustment consisted of: $3/5 X$ (the percentage by which the amounts prescribed in the OHIP schedule of benefits for paediatric services rendered in the previous fiscal year are increased for the current fiscal year) + $2/5 X$ (the percentage by which the hospital global budgets for the previous fiscal year are increased across the board).

CHAPTER 2 THE ANALYTICAL FRAMEWORK

The operation of an effective and efficient health care system requires consistency between the goals of the physicians and the goals of the system. In an OECD Social Policy Study, Sandier (1990) concluded that the incentives provided within alternative methods of physician payment were influenced by the health care system structure and the restrictions this structure placed on the practice of the physicians. This would suggest that a discussion of physician performance must include the system factors which impact physician practice. An analytical framework was developed to structure the analysis in this regard. Figure 2.1 provides the framework which was adapted from previous work by Hornbrook and Berki (1985). The components of the model include: External Environment; Objectives of the Health Care System; Structure of the Health Care System; Objectives of the Physicians; Structure of Physician Practice; and Physician Performance. The sections following describe each of the components.

Figure 2.1 Analytical Framework
Adapted from Hombrook & Berki (1985)



2.1 Environment Impacting the Health Care System

As early as the late 1940's, organizational researchers documented the need to study organizations in relation to the world around them (Kimberly & Zajac, 1985). Thompson (1967), Lawrence and Lorsch (1969), Perrow (1970) and Pfeffer and Salanick (1978) demonstrated the impact of the environment on organizational survival. Not all aspects of an organization's environment are equally salient (Kimberly & Zajac, 1985) and the effects of environmental factors such as social, technological, economic and political must be considered.

Figure 2.2 The Changing Health Care Environment

Social	<ul style="list-style-type: none"> • Aging of the population may result in health care funding reallocated from smaller paediatric population to growing population of older adults • More women in the workforce has resulted in less availability of women to care for sick children at home • Increased consumer expectations for health care services, consumer organizations demanding a role in the planning and evaluation of health care
Technological	<ul style="list-style-type: none"> • Advances in technology enable children with severe illness or disability to survive for longer with substantial impact on the health and social services systems
Economic	<ul style="list-style-type: none"> • Declining revenue base of the Government of Ontario with substantial deficits at both the provincial and federal levels have resulted in decreased funding for health and social services • Has also led to reduced funding for the education of health care professionals
Political	<ul style="list-style-type: none"> • Increasing private sector presence in health care delivery has led to increasing competition primarily on costs

Figure 2.2 highlights some of the significant environmental changes with an impact on the objectives and structure of the Ontario health care system. The general theme of the environmental changes relates to increased expectations for health care service with declining resources available to cover the costs of these services.

2.2 Objectives of the Health Care System

The original terms of reference for the Canadian health care system were clearly reaffirmed as public objectives in the Canada Health Act (1984). They include:

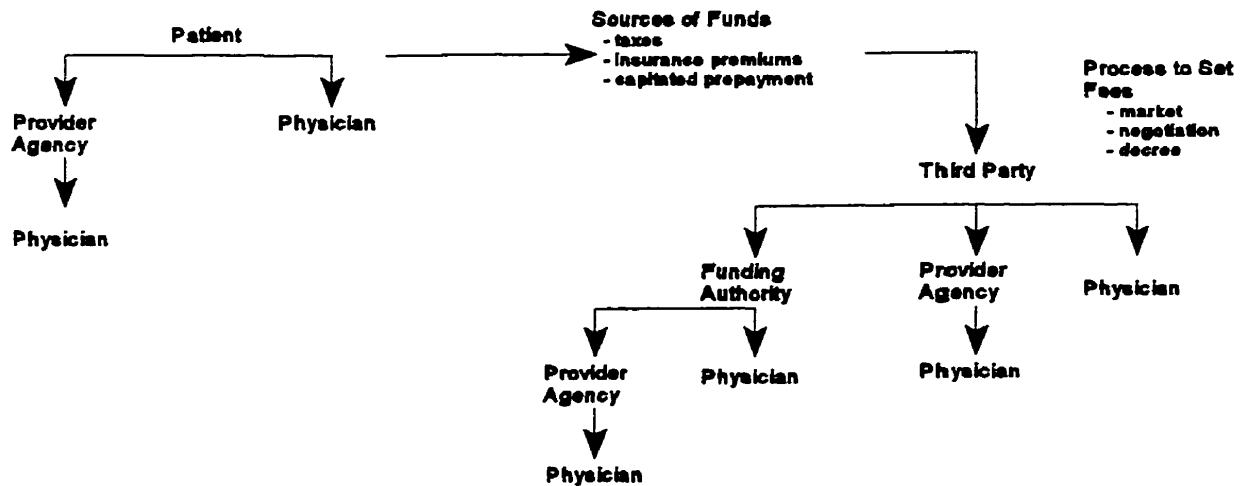
- public administration,
- reasonable access to necessary medical care services on uniform terms and conditions without financial or other barriers,
- comprehensive benefits,
- portability of benefits across provinces, and
- universal coverage.

Based on an analysis of recent policy papers and documents, Coyte (1995) suggested that the goals of the Ontario health care system were to ensure cost-effective and affordable provision of health care services, the continuity and comprehensiveness of patient care, and the ability of consumers to choose and participate in their health care. This would suggest the primary *Objective of the Health Care System* is to provide cost-effective and affordable publicly funded health care services, with all residents having the ability to choose and participate in a comprehensive range of necessary services. Canadians have free choice of physicians and the Canada Health Act (1984) imposed financial penalties on the provinces that allowed extra-billing by physicians to their patients.

2.3 Structure of the Health Care System

The *Objectives Of The Health Care System* shape both the *Structure Of The Health Care System* and the *Structure Of Physician Practice* within this system. Figure 2.3 presents the possible structures (or flow) of physician payment, ranging from direct payment from the patient to third party reimbursement, with various levels of transactions possible in between.

Figure 2.3 Physician Payment Structure Options



In Canada, post Medicare, the objective of accessibility has resulted in few direct payments by consumers to providers for insured health care services. Payment for service rendered typically takes place between the public insurer and the provider (Evans et al., 1989). Consistent with the objective of public administration, Canada has a collection of provincial single-payer systems and payments to physician providers are usually negotiated between the province (the payer) and the provincial medical association. However, in recent years some provincial governments have acted unilaterally in changing physician fee schedules. While market forces do not directly influence the establishment of provider payments in the Canadian system, Barer, Evans and Labelle (1988) suggested that the strong political power of physicians generally ensures that fees will not be

established solely by administrative decree. Marmor and Thomas (1971) found that in any medical care system physician preferences had a strong role in determining governmental methods, but not necessarily the amount of payments. Sandier (1990) indicated that when the cost of health care is covered by some form of public health care insurance (as is the case in most OECD countries), the funders negotiate the remuneration of the providers.

The determination of level of compensation can range from market-driven, (as is the case in the United States for medical services other than Medicare and Medicaid), to a negotiation process between the payer and the physicians, (as is the case in Canada), to an administrative decree by payers (Reinhardt, 1985). After a review of international systems of physician payment Reinhardt (1985) concluded “the freewheeling market approach to fee-for-service compensation, with its high variation among physician (that is practiced in the United States), is not viewed as the natural order of things anywhere else in the world” (p.375). In addition, the costs of billing and the costs of bad debt in the United States add substantial inefficiency to the US system. In most countries, the government regulates the levels of fees paid to physicians (Lee, Grumbach & Jameson, 1990).

In Canada, the level of payment is established through a province-specific negotiation process. With the establishment of health insurance for medical services, most provincial governments accepted the fee schedules of the provincial medical associations and paid amounts ranging from 85 to 90 percent of the fee schedule value (Lomas et al., 1989). Over time a more formal negotiation process was established in each province to determine the increases to the fee schedules. In the 1980s the provincial governments, to varying degrees, recognized the need to

control not only the service prices, but also the service quantity. This led to the establishment of formal dispute resolution processes within the provincial negotiations.

In Ontario, a single provincial fee schedule is negotiated between the government and the physicians. There are two components to the negotiations: the first is the size of the total fee increases, and the second is the allocation of this increase across the medical fee items defined by specialty. In an attempt to control the increasing costs associated with the provision of medical care in Ontario, an expenditure threshold or cap was negotiated with the physicians. Under this threshold cap, the physicians as a group were accountable for a portion of the growth in the global expenditures. If the identified threshold expenditure was exceeded by Ontario physicians, they would be subject to a revenue claw back in the following period.

The method of physician compensation (for example, fee-for-service, fee-for-medical case, fee-for-episode of care, fee-for-patient/capitation, or fee-for-period/salary) is also dependent upon the structure of the health care system. Figure 2.4 provides a summary of the advantages and disadvantages of each of the methods of physician remuneration.

Figure 2.4 Advantages and Disadvantages of Physician Compensation Methods

COMPENSATION METHOD	ADVANTAGES	DISADVANTAGES
FEE-FOR-SERVICE	<ul style="list-style-type: none"> - greatest amount of patient choice, - provides a record of activity which can be used for management purposes, - from the perspective of the payer, given the will to negotiate, enables budgetary control, - enables participating physicians the greatest amount of clinical autonomy, - provides the physician with a direct relationship between the service provided and the compensation received, and - has been shown to provide better accommodation to changing physician to population ratios than other systems; 	<ul style="list-style-type: none"> - inflationary, with incentive to increase the provision of service, - disproportionate ranking of procedures above cognitive services, counselling, planning, medical education, and research, - disincentive for physicians to be involved in initiatives designed to improve quality of care, - no incentive for physicians to spend unbillable time with patients, - potential for inequities in physician remuneration among specialties, - records and correspondence are not income producing, - seen to create conflict between physicians and the hospitals in which they work, - interruption of practice may result in complete loss of income, - does not typically reward for experience or ability, - more expensive and least flexible to administer as a result of the large number of transactions that need to be recorded.
FEE-FOR-MEDICAL CASE/EPISODE OF CARE (CASE-BASED)	<ul style="list-style-type: none"> - ability to monitor and maintain quality of care, - does not limit the array of services which may be provided, and - less incentives to provide excess and possibly unnecessary services, 	<ul style="list-style-type: none"> - potential for "DRG/CMG creep", or manipulation, - difficulties in acceptable definitions of medical cases/episodes and accounting for payments to specialists, - inherent incentives for limiting the number of services per case and possibly "dumping" hard to serve patients on other physicians.

Figure 2.4 Advantages and Disadvantages of Physician Compensation Methods, Continued

COMPENSATION METHOD	ADVANTAGES	DISADVANTAGES
<p>FEE-FOR-PATIENT (CAPITATION)</p>	<ul style="list-style-type: none"> - provides predictable revenue for the physician, - does not limit array of services that may be provided, - easiest system to forecast future program costs, enabling easier service planning, - less incentive to provide excess and possibly unnecessary services, - incentive for the physicians to keep their patients satisfied, otherwise the patients will switch physicians, - may encourage a preventive rather than restorative approach and continuing responsibility rather than episodic courses of treatment, - incentives to control costs, through the development of a more cost-conscious style of practice, and - easier to administer than FFS. 	<ul style="list-style-type: none"> - may lead to avoidance of enrollment of those most in need of care, who are expected to have significant demands for service, - may lead to increased referrals to other physicians, - must be strengthened with constraints such as hours of work, or acceptable patient numbers to be effective in changing physician behaviour, - limits the patient's choice of provider for a defined period and may cause concern among consumers of under servicing, and - potential that physicians can increase their incomes by spending less time and fewer resources with patients.
<p>FEE-FOR-PERIOD (SALARY)</p>	<ul style="list-style-type: none"> - ability to develop explicit service arrangements with physicians, which could include expectations related to service quantity, service quality, resource management, CME, and management activities, - enables greater consistency among the physicians with the hospital objectives, - enables funders to maintain greater control over expenditures, - amenable to rational planning and allocation of physicians, - simpler to administrate than FFS or capitation models and therefore less costly; and - salary provides a measure of income security and eliminates constraints on choice of diagnosis or treatment methods. 	<ul style="list-style-type: none"> - does not provide any incentive to work harder, - may increase referrals to other physicians, - may be less responsive to patients' nonurgent needs than FFS physician, - if the salary is not linked to patient satisfaction, may reduce patient satisfaction with care.

While the majority of Ontario physicians is remunerated on a FFS basis, alternate funding/payment plans have been negotiated and implemented in Ontario for community health centres (CHC)³, health service organizations (HSO)⁴, some emergency departments and some academic medical programs.

Community health centres receive program-based funding from the Ministry of Health to cover a negotiated range of services specific to the communities served. There are 56 CHCs in the province with about 125 full-time equivalent physicians, with all CHC staff receiving payment by salary.

The health service organization program provides prospective payments to groups of physicians based on the numbers of reported or rostered patients. The HSOs use the capitation payment to pay the salaries of the physicians and associated staff of the HSO practice. There are 59 HSOs in the province with about 200 physicians. The HSO program goal is:

to ensure accessible, flexible, coordinated, high quality primary care,
emphasizing health promotion and disease prevention, in a cost-effective
service delivery model that offers alternatives to institutional care
whenever possible (Ontario Ministry of Health 1991, p.5).

³Community health centres provide a range of primary health care and social services to rostered patients in Ontario and in Saskatchewan (known as health cooperatives) and British Columbia (health and human resource centres). (MacKenzie et al., 1993). They are governed by a community board and remunerate physicians on a salary basis, negotiated between the physicians and the board.

⁴Health service organizations have existed in Ontario since 1973, providing primary care physician services, with capitation funding for rostered patients (MacKenzie et al. 1993). Previously some HSOs received additional funds for certain types of specialty care, but this has been discontinued (Vayda, 1994).

The alternate funding plans for emergency departments are individually negotiated to ensure sufficient physician coverage. In addition to the AFP with the HSC Department of Paediatrics, alternate funding/payment plans have been negotiated in academic settings with the South Eastern Academic Medical Organization (SEAMO) in Kingston (effective July 1994), the surgical and psychiatric specialists at HSC (effective July 1994) and the Children's Hospital of Eastern Ontario.

There have been no published studies of the impact of alternate funding plans in the academic sector or within community health centres. The published studies of HSOs have shown mixed results. The pattern of use of medical services has not been found to be predictable, with some studies finding lower medical service use with alternate funding arrangements and others finding lower use in the FFS population (Abelson & Birch 1993). Vayda et al (1989) found that CHCs and HSOs were more likely to have formal workload guidelines, patient recall practices, greater levels of care provided by non-physician health professionals and monitoring of hospitalization patterns than private physician group practices. However the effect of these mechanisms on patient care and utilization were not compared among the FFS practices and the CHCs and HSOs.

2.3.1 Structure of the Academic Health Science Centre

The academic health science centre has a structure that has been influenced by the tripartite missions of teaching, research and clinical care. In Canada, revenues from clinical services provided by physicians have been used to support the costs of teaching and research within the academic health center. At the University of Toronto, a large proportion of the total funding of

the Faculty of Medicine is generated by FFS billing and hospital support of clinical teachers (ACMC/ACTH, 1995). However, funders of hospital services have expressed concern about the high costs of the academic centres and alternative funding/payment plans are seen as an option to recognize and support the costs associated with clinical teaching. The Fundamental Principles of the Alternative Funding

Plan of the Queen's University Faculty of Medicine, suggested that funding should be sufficient to cover all three of the objectives of the Academic Medical Centre: education; research, scholarship or inquiry; and provision for the support of an effective interface between the Faculty and the Teaching Hospitals (and other health service providers) so that the clinical services meet the needs of the referral communities. Several reports have recommended restructured funding for academic medical centres to achieve the objectives of education, research and clinical care, with less reliance on clinical incomes (Barer & Stoddart, 1991; Ontario Hospital Association, 1991). The studies in this area suggest that the structure of the academic health science centre and the requirement to meet the needs associated with clinical care, teaching, and research require an alternative method of physician payment to the current FFS system.

2.4 Objectives of the Physician

The next component of the Framework (Figure 2.1, page 11) that will be addressed is the *Objectives of the Physician*. Pauly et al. (1992) presented three models which they suggested could be used to interpret how physicians responded to financial incentives. The first model is the *patient agency model*. An agency relationship exists whenever one party contracts with another party to perform some actions on its behalf (Pontes, 1995). In a direct patient-physician

(Hillman, 1991). However, the structure of the health care system results in other parties, such as payers and regulators, impacting on the patient-physician agency relationship. When physicians are required to incorporate financial constraints or are motivated by financial incentives, they become the agent of the payer, in addition to their role as patient agent. This creates a conflict of interest for the physician (Hillman, 1991). The Ontario Hospital Association (1991) indicated that physicians were no longer regarded as private agents for their patients' (and their own) interests, but as agents for the collective objectives of the health care system. The changing nature of health care delivery has also resulted in a diminishing of the bond between patient and physician, with a corresponding strengthening of the relationship between physician and practice organization (Greenfield, 1989).

Rice (1983) indicated that one reason physicians may deviate from their role as patient agent is to protect themselves against malpractice suits. Test ordering behaviour may reflect the physician's desire to avoid a malpractice suit. A second reason for potential deviation discussed by Rice (1983) was the physician's economic motivation. The research has strongly supported changes in physician practice behaviour in response to financial concerns (Barer, Evans & Labelle, 1988; Gable & Rice, 1985; Rice, 1983). These factors suggest that while physicians generally act as agents for their patients this role is modified by other motives.

The second, the *profit maximization model*, suggested that physicians will constantly seek to increase their incomes. Under this model physicians make their decisions in relation to the impact on their long term financial status. Hemenway et al. (1990) found support for the profit

maximization model. When physicians in an ambulatory care centre were reimbursed based on a percentage of the gross monthly charges they generated (as opposed to a flat hourly rate), utilization of physician services, as well as laboratory and radiology tests, increased significantly. However, Pauly et al. (1992) suggested that the profit maximization model does not hold up well to actual physician practice, as other physician objectives influence physician decision making (for example, the provision of high quality medicine). This was supported by the study by Hurley, Labelle, and Rice (1990) which found that while physicians can initiate utilization shifts in response to fee changes, they do not always do so.

The final model is the *target-income model*, where physicians seek a 'target' income level and structure their practice accordingly. This model is a variant of the utility maximization model (Gabel and Redisch, 1979), which hypothesized that physicians structure their practice and resulting income to meet their personal goals, which may include goals such as the ability to treat interesting cases. Barer, Evans and Labelle (1988) suggested that because physicians can influence the demand for their services they are able to maintain a "roughly specified level of target income" (p. 3). Wright (1991) found evidence of a 'target-income' practice among physicians, with practice workloads designed to generate a predetermined income. In a study of general practitioners in Copenhagen, Krasnik et al. (1990) found that with a change in payment from capitation to a combination of capitation and fee-for-service, the physicians initially overshot their

target income through high activity levels, however, in subsequent periods the activity level decreased as the physicians achieved their target incomes⁵.

The target income model appeared to be the most consistent with physician motives as demonstrated in the literature. Rizzo and Blumenthal (1995) found that physician target incomes varied with fluctuations in actual income and in relation to physician and practice characteristics. They suggested that physicians unconsciously set their income targets to compensate for the difficulties, costs, and risks associated with the establishment of their medical practice. This would suggest that physicians will structure their practices to achieve their target income.

2.5 Structure of Physician Practice

The Analytical Framework (Figure 2.1, page 11) suggests that both the *Objectives of the Physician* and the *Structure of the Health Care System* impact upon the *Structure of Physician Practice* within the system. Hastings & Vayda (1986) supported a link between practice structure, health system structure, and physician performance by suggesting that through the use of alternative practice models “substantial shifts could be made from acute hospital inpatient care to less costly alternatives, including community health centres” (p.340). Where previously physicians had substantial autonomy in decisions about their practices, changes in the structure of the health care system have had an impact on the nature of physician practice. For example, Leatt et al. (1989) suggested that medical staff organization and practice is being controlled to a greater

⁵ However, the self-selection of these physicians may limit the generalizability of these results to other physicians.

extent by outside organizations, such as professional organizations, the government, and hospitals or other provider organizations. The evolving health care paradigm requires physicians working within an academic health centre to function within multi-disciplinary teams, to focus on effective resource utilization, and to modify their practice patterns to meet patient needs. Fried and Leatt (1986) also identified that the increase in the number of salaried physicians has changed the relationships between the physicians and their employers. Figure 2.5 illustrates the changing nature of physician practice resulting from changes in the structure of the health care system.

Figure 2.5 Paradigm Shift in Physician Practice

PRACTICE PARADIGM IN WHICH PHYSICIANS WERE TRAINED	EVOLVING PRACTICE PARADIGM
• independent activity/practice	• group/team effort
• department focus	• system focus
• competitive orientation	• customer service orientation
• directing/controlling	• supporting/collaborating
• free-style practice	• protocols/guidelines/standards
• judging quality	• continuous quality improvement
• provision of functional expertise	• strategic business orientation

Within the hospital sector, physician practice has been changing, pressured both by financial constraints and greater recognition of the importance of client and patient focused care.

Organizational structures within the hospital sector are changing to reflect organization around the needs of patients with interdisciplinary teams providing coordinated care. Physicians appear to be taking a greater role in strategic management of the health care system.

As this study focuses on a group of paediatricians, the next section provides a discussion of the structure of physician practice within paediatrics.

2.5.1 Changing Physician Practice Within Paediatrics

The practice of paediatrics has undergone significant change over the years. Paediatrics developed as a medical specialty in the late 1800s (American Academy of Pediatrics, 1991). In 1933 paediatrics evolved as a formal entity, with the establishment of the American Board of Pediatrics. In the late 1950's a "new paediatric" practice was identified, with the expectation that paediatricians would have greater involvement in identifying and responding to the social and emotional problems of children (Bergman et al., 1966). The nature of paediatric practice has continued to change. Mortality and morbidity from infectious diseases have decreased (Haggerty, 1974), with the result that the current serious problems of children largely comprise of intentional and unintentional injuries, chronic disease, and developmental, behavioural, social, and educational disorders (American Academy of Pediatrics, 1991). In 1974, Haggerty indicated that chronic disease accounted only for approximately 3% of paediatric practice, but that over 10% of children had some form of chronic illness. He suggested that this imbalance would result in chronic diseases becoming a larger part of paediatric practice.

In addition, there has been considerable debate related to the extent that paediatricians practice primary care versus the specialist, consultative nature of the practice. Paediatric practice in North America is quite different from paediatric practice in the Western European countries, where the paediatrician is usually hospital based and functions as a consultant (Yankauer et al., 1970). A number of studies have addressed the primary care/specialized service dichotomy of paediatrics (Bergman et al., 1966; McCrindle et al., 1992). One recent study found that the compensation method for primary care physicians had an influence on the distribution of primary versus

secondary level procedures completed in the practice (Conrad et al., 1998). The funding model was shown to influence the amount of primary and secondary paediatric care provided in the practice. The *Structure Of Physician Practice* is therefore an important component of the analytical model, with relationship to the *Structure of the Health Care System*, the *Objectives of the Physician* and *Physician Performance*.

2.6 Physician Performance

The literature was reviewed for a definition of performance for the academic paediatrician. "...the general paediatrician in academia has a significantly different role than does the general paediatrician in clinical practice" (Helfer, 1992, p.545). Helfer (1992) identified the following seven functions of the general paediatrics unit within an academic department: teaching; developmental and behavioural paediatrics; preventive paediatrics and epidemiology; community services and child advocacy; administrative responsibilities; clinical services; and research. Many authors have identified the difficult balance between teaching, research, and patient service within the academic environment (Iglehart, 1993; Ledley & Lovejoy, 1993; Anderson et al., 1994).

The American Academy of Pediatrics (1991) stressed that "time for both bench and clinical research studies must be protected as faculty face increasing pressures to generate income from patient care (p. 406). Ledley and Lovejoy (1993) postulated that the multifaceted careers of academic paediatricians resulted from the impositions of research on their primary responsibilities of teaching and clinical care. Their study found that "respondents expressed profound pessimism when asked to describe their feelings about the future role of physicians in research" (pg. 441).

The Hospital for Sick Children Department of Paediatrics Funding Agreement (1990)⁶ defined Department Services as “clinical, teaching and research activities (including related administrative activities) carried out by the Department Physicians in the premises of the Hospital, a related facility or the University” (p.2). The role of the academic paediatrician is therefore defined for this study as encompassing clinical practice, teaching, and research activities and performance relates to the quantity and quality of the outcomes of the practicing paediatricians in each of these areas.

The Analytical Framework (Figure 2.1, page 11) suggests that the *Structure of Physician Practice* has an impact on *Physician Performance*. This is consistent with research in the field of organizational behaviour in which organizational effectiveness has been shown to be associated with organization design (Leatt, Shortell & Kimberly, 1994, Shortell, 1994). In addition, Pauly (1970) suggested that the output of the physician is related to the method of compensation of the physician. Although the consumer is expected to make the final decision whether and what health care services to receive, the characteristics of the patient - physician relationship results in the physician creating much of the demand for medical services. Many studies have demonstrated that a change in the payment level can result in physicians creating changes in the quantity or complexity of the services provided to influence the payment received (Barer, Evans & Labelle, 1988; Gable & Rice, 1985; Rice, 1983; Marmor & Thomas, 1970).

⁶See Appendix 9.2.

CHAPTER 3 LITERATURE REVIEW: EMPIRICAL RESEARCH RELATING TO THE STUDY HYPOTHESES

Over the years, a variety of studies have been conducted to determine the effects that financial incentives to physicians might have on the provision of health care services. The following sections review this research. The majority of the research was based in the United States, as the U.S. system has a variety of payment models which have been implemented and evaluated. In the Canadian system prices for physician services are set in a monopolistic market (MacKenzie et al., 1993), which has limited the extent to which research on physician's fees can be conducted. While it is recognized that the American and Canadian health care systems are very different, there may be lessons to be learned from the experience in physician payment in the U.S.

Physician payment for services rendered can be viewed as an exchange process. The physician provides a health care service in exchange for the payment. In Canada patients do not generally make out-of-pocket payments for most necessary medical services. They have no awareness of the price of medical services. Therefore Canadian patients are not directly impacted by changes in the level or method of compensation. It is the Canadian physician who is directly affected by fee changes (Hurley, Labelle & Rice, 1990). As such, any changes in utilization as a result of changes in the payment mechanism can be considered to be supplier-driven (Hurley, Labelle, and Rice, 1990).

3.1 Impact of the AFP on Clinical Utilization

To date, the research results on the impact of changes in physician payment on clinical utilization have been inconsistent. For example, Abelson and Birch (1993) reviewed the existing studies of alternative funding and delivery models and found that patterns of medical service utilization related to changes in funding methods were not predictable. They found mixed results, with some studies reporting lower medical use in the capitated HSO population, while others found lower use in the FFS population.

Renaud et al. (1980) completed a study comparing the medical care provided for tension headaches in the community health and social service centres (CLSCs)⁷ with that provided in private practice in Montreal. The CLSC physicians were compensated by salary, whereas the private practice physicians were paid on a FFS basis by the Quebec Health Insurance Board. This study found that 50.6% of the private practice physicians and 25.0% of the physicians employed in CLSCs prescribed what was judged to be inadequate therapy. The CLSC physicians spent more time with the patient (an average of 21.1 minutes, compared to an average of 8.0 minutes for the private practice physicians). The authors also reported that patient satisfaction was lower for the private practice (FFS) physicians. Kristiansen and Holtedahl (1993) found in a study of GPs in rural Norway that physicians paid on a FFS basis provided more home visits (which were reimbursed at a higher rate) than salaried physicians. They also expected that FFS physicians

⁷Centre Local de Services Communautaires (CLSC) - The local community centres have been in existence in Quebec since 1970, providing health and social services to a defined geographic area. The CLSCs receive per capita funding and pay the physicians a salary (MacKenzie et al., 1993), although the physicians receive payment directly from the Quebec Medical Plan, and not through the CLSC administration (Crichton, 1993). The initiation of the CLSCs was a move towards a physician group practice model, which would provide services on a 24-hour basis, 7 days a week (Renaud et al., 1980) and is the only provincially planned regional network of health and social services (Vayda, 1994).

would spend less time with each patient to enable them to see more patients. However, contrary to their expectations, the payment method did not have an impact on the length of the consultations provided by the GPs in the study.

The disadvantages that have been identified for the FFS model of physician payment strongly suggest a potential for over-utilization of physician services under this mode of remuneration. Funders of physician services consider FFS to be inflationary, as it carries a powerful incentive to increase the provision of service (British Columbia, 1993; Wilensky & Rossiter, 1986). In a 1960 study investigating a change in physician compensation, Alexander (1967) concluded that because nothing else in the program had changed except the method of compensation, the observed increase in physician visits and prescription services was likely a result of the change in payment mechanism from capitation to fee-for-service. These increased services created an increase in the total costs of the program under study, and there was also an increase in the administrative costs of the program related to the FFS payment mechanism.

The benefit schedules associated with FFS tend to desegregate services to provide more information, which Showstack et al. (1979) have postulated leads to medical cost inflation as doctors charge for higher valued and increased numbers of services. Woodward and Warren-Boulton (1984) indicated that only output-based incomes (such as FFS) for physicians contained the financial incentives which may result in physicians providing more than appropriate amounts of medical care.

The FFS system encourages a disproportionate ranking of procedures above cognitive services, counselling, planning, medical education, and research (Vayda, 1994; Wright, 1991; Reinhardt, 1985), as there is no incentive for physicians to spend unbillable time with patients (British Columbia, 1993). Fee schedules “tend to place greater rewards on procedures such as surgery, injections, X-rays, and laboratory and diagnostic tests, than on less clearly defined consultative or preventative services “ (Showstack et al., 1979 p. 240). Schroeder and Showstack (1978) developed a number of theoretical models which they used to demonstrate that the FFS system in existence in the United States at the time of the study contained strong financial incentives for the use of technology-intensive medical care within primary medical care. Blumenthal and Epstein (1992) suggested the FFS system contained “perverse financial incentives to specialize in highly technical disciplines and overuse certain procedures and diagnostic tests, thus reducing the appropriateness and increasing the cost of medical services” (pg.1330).

Proponents of salaries or service contracts for physicians cited the major benefit as the ability to develop explicit service arrangements with physicians, which could include expectations related to service quantity, service quality, resource management, continuing medical education, and participation in management activities (British Columbia, 1993). It was suggested that salary systems decreased the amount of excessive services provided (Nova Scotia, 1993).

The major disadvantages cited for the salary system include potential lack of incentives for physicians to work more effectively (Nova Scotia, 1993; Reinhardt, 1985; Lee & Butler, 1975); and the possibility of increasing referrals to other physicians (Coyte, 1995). This off-loading of

referrals was illustrated in a small study by Eisenberg et al. (1974). A group of four paediatricians, who had one practice for which they received a salary and a separate practice with FFS compensation, were studied for an eight week period. The physicians ordered significantly more laboratory tests, and referred significantly more patients for consultation in the practice for which they received a salary, as compared to the FFS practice.

Hickson et al. (1987) suggested that salaried physicians may be less responsive to patients' nonurgent needs than FFS physicians. If the salary is not linked to patient satisfaction, it may reduce patient satisfaction with care (Nova Scotia, 1993; Reinhardt, 1985). However this was not supported in a study by Hickson et al, (1987), who found no difference between FFS physicians and salaried physicians in terms of patient satisfaction. (The study involved the random assignment of 18 medical residents within a clinic setting to either FFS or salary compensation.) However, the study did find 22% more per capita visits by patients using the FFS physicians than for patients using the salaried physicians. This finding was consistent with a study by Hemenway et al. (1990) which found that salaried physicians tended to treat their patients less aggressively than FFS physicians. However, Groenewegen and Hutten (1995) reported on studies that showed consultation lengths in countries with salaried physicians to be two to three times longer than in countries with FFS. Coyte (1995) suggested that the change at The Hospital for Sick Children from FFS to global budget reduced the participating physicians' incentives to 'earn' their full salaries. However, the extant research suggested that FFS may result in over utilization and that the AFP might result in more appropriate levels of utilization.

It has been hypothesized that the FFS funding system also encourages inappropriate use of hospital services. The large variation in utilization rates among regions and the variable quantities of services provided to comparable patients in different hospitals are evidence of this inappropriate utilization. A number of studies have shown a direct connection between financial incentives and service utilization. For example, Hillman et al. (1990) found that the patients of physicians who themselves performed diagnostic imaging examinations were four times more likely to have an imaging procedure than patients with similar symptoms whose physicians referred to a radiologist for diagnostic imaging. While the authors were unable to state which practice pattern represented the most appropriate care, they suggested that financial incentives had an impact on the service utilization studied. These results were consistent with a previous study by Hemenway et al. (1990), which found that use of imaging services increased when the physician compensation method was changed to include consideration of the frequency with which the physicians ordered the service. This study was conducted on a consistent group of physicians and patients, with no changes in the financial impact on the patients.

Studies have found reduced numbers of procedures for patients associated with practices with other than the traditional FFS payment system. Perkoff, Kahn and Mackie (1974) and Perkoff, Kahn and Haas (1976) found that a prepaid group practice HMO⁸ used more ambulatory services, but less hospital days than a comparable group of patients cared for by fee-for-service private

⁸Health Maintenance Organizations (HMOs) - Health maintenance organizations provide comprehensive coverage of hospital services, physician services, mental health care, drug benefits and other options in the United States (MacKenzie et al., 1993). HMOs generally receive pre-payment (capitation) to cover the costs of a defined set of health care services for the population covered. Physicians employed in HMOs can be paid by salary, fee-for-service, or capitation, and may participate in profit-sharing or other efficiency-based incentive programs.

physicians. Tussing and Wojtowycz (1994) compared cesarean section rates among prepaid group practice health maintenance organizations (HMOs)⁹, FFS independent practice associations (IPAs)¹⁰, and conventional fee-for-service practice (FFS). Their results indicated that when the diagnoses usually resulting in cesarean-sections were controlled, HMO physicians were less likely to perform c-sections. Hillman, Pauly and Kerstein (1989) identified a number of factors within the HMO model with an impact on use of hospital services. Both salary and capitation payment to physician were found to be associated with lower hospital use in comparison with FFS physician payments. However, these studies generally were not able to determine conclusively whether the differences were a result of the different models or were simply a case of physicians with particular practice styles that self-selected into their preferred mode of practice.

A number of reasons for the observed differences in utilization of services have been hypothesized. The lower hospitalization and procedure rates of the alternative models could be the result of: (1) self-selection by patients who are less frequent users of the health care system (Stearns et al., 1992; Lichtenstein et al., 1991; Strumwasser et al., 1989); (2) the alternative models may serve to attract those physicians with more conservative practice styles (Luft, 1991; Stearns et al., 1992); or (3) alternative practice and funding arrangements actually provide incentives to physicians to practice more cost-conscious care delivery (Strumwasser et al., 1989).

⁹ Categorized as per the Welsh, Hillman and Pauly (1990) typology.

¹⁰ Categorized as per the Welsh, Hillman and Pauly (1990)typology.

For example, less expensive ambulatory care may be substituted for more expensive hospital care for enrollees (Perkoff, Kahn & Haas, 1976, Stearns et al., 1992). In the following sections the studies which have attempted to test these hypotheses are reviewed.

(1) Studies investigating self-selection by patients who are less frequent users of the health care system

The studies that have investigated the possibility of self-selection by members of the alternative delivery models have not had consistent results. Strumwasser et al. (1989) found that employees who enrolled in either a health maintenance organization (HMO) or a preferred provider organization (PPO) used less covered health care in the year before enrollment in comparison to the employees who remained with the traditional carrier. The authors indicated that “biased self-selection was apparent in the rate of hospital admissions, in the average length of stay of those admitted, and in outpatient visits and services” (pg. 438). The authors suggested that only those patients with infrequent contact with the health care system would be willing to switch providers, while heavy system users would want to remain with their physician and would chose to remain in the existing plan. However, there were limitations to the analysis, as employees of only one company were included, which may limit the generalizability to other individuals. The long term reliability of the data was not considered and the authors recognized that past utilization may not accurately predict future utilization. In a study with opposite results to Strumwasser et al., Feldman et al. (1989) found no evidence of selection bias. However, this study also found similar levels of utilization in the HMOs relative to the FFS practices.

(2) Studies investigating self-selection of physicians who naturally limit services when they feel the costs outweigh the benefits

Murray et al. (1992) studied a university-based general medical practice where the physicians had a mix of FFS and capitation patients within their caseload. They found that the capitation patients had fewer laboratory tests, and consequently, lower patient costs than the FFS patients. The authors suggested that the capitation and FFS patient populations were similar as there were no statistically significant differences in hypertension control or in the hospitalization rates. In addition, there were no differences in the number of physician visits among the FFS and capitation patients. The conclusion was that the physicians were motivated by the cost-containment incentives within the capitation plan to change their test ordering behaviour, without any compromise in the health outcomes of the patients. Because the physicians were involved in both retrospective and prospective reimbursement and only changed their test ordering behaviour with the capitation plan patients, this study provided evidence for the financial incentive within the alternative model impacting behaviour and not self-selection by the physicians.

(3) Studies investigating whether alternative practice arrangements provide incentives to physicians to practice more cost-conscious care delivery.

In a study analyzing the relationship between utilization and changes in relative fees and the real fees received for providing the services, Hurley, Labelle, and Rice (1990) found that utilization responded to fee changes in 13 out of the 28 procedures studied. This led the authors to conclude that “although physicians can initiate utilization shifts in response to fee changes, they do not always do so” (p. 74). Hurley, Labelle, and Rice (1990) used time-series data to demonstrate a

statistically significant change in utilization of a surgical procedure in response to an isolated change in the fee for the operation. Like these Canadian studies, an American study by Escare (1993) reported inconclusive results regarding the effects of variations of relative fees on the demand for surgical operations by elderly Medicare enrollees.

There are other factors which may have influenced the sometimes contradictory results of the studies in this area. The previous sections considered whether the financial incentives employed in HMOs impact physician behaviour. It is also possible that the group practice model in itself may provide the utilization changes identified. Luft (1978) found that prepaid group practices had lower hospital days per enrollee than prepaid individual practice associations. Several researchers have suggested that the organizational aspects of group practice had significant impact on lowering hospital utilization (Nobrega et al., 1982; Scitovsky & McCall, 1980). Hsiao et al., (1988) suggested that it was not possible to determine whether the lower hospital and surgical rates found in HMOs were due to the economic incentives of the physicians or to the influence of the HMOs' organizational structure on the physicians' practice patterns.

In addition it is possible that there are characteristics within the service plans that are not measured within the study which impact the results (Hellinger, 1996). This means that there may be other variables with a greater influence on practice patterns which have not been addressed in the extant literature. Hellinger (1996) suggested that benefit structure, use of clinical guidelines, use of utilization review procedures, educational activities and the existence of peer pressure were

all factors which could potentially influence the study results. However, few studies were able to include measures of these factors in the analysis.

Although the results have been mixed, the literature review on the impact of changing physician funding/payment suggests the following hypotheses for this study with respect to physician clinical utilization:

H1: The AFP will be associated with decreased clinical utilization by the participating paediatricians.

H2: The AFP will be associated with a change in the type of services the paediatricians provide to their patients and families, with more counseling and consulting services and less procedurally-based services.

3.2 Impact of the AFP on Teaching and Research Activity

Few studies have related the level of participation in teaching and research to payment method. Davies, Langley and Speert (1996) stated that “most Canadian departments of pediatrics have not established formal policies for addressing faculty members’ contributions to published research” (p.882). Given that one of the purposes of the AFP was to enable Department members to concentrate on research and teaching without having to ensure sufficient fee-for-service revenue from clinical practice to subsidize these activities (Haslam & Walker, 1993), one would expect the participating physicians to demonstrate an increase in teaching and research activity. This leads to the following hypotheses.

H3: The AFP will be associated with increased research activity among the members of the Department of Paediatrics

H4: The AFP will be associated with increased teaching activity among the members of the Department of Paediatrics

3.3 Impact of the AFP on Physician Satisfaction

MacKenzie et al. (1993) reviewed the Canadian Medical Association's 1990 PRQ Survey and reported that FFS specialists worked 4% more hours than salaried specialists and GP/FPs on FFS worked 11% more hours than salaried GP/FPs. However, the small number of physicians on salary at the time of the survey (9.5%) potentially limits the usefulness of these results. Reinhardt (1985), in an international study of physician compensation, found that physicians paid by capitation worked slightly fewer hours in direct patient care as compared to FFS physicians. Because of the variation in medical practice among the participating countries, Reinhardt suggested the differences were not statistically significant, but was not able to complete a test. In addition, from the physician perspective, there is a perceived loss of income and a perceived threat to the professional autonomy of the physician with the implementation of either a capitation or salary method of remuneration (Nova Scotia, 1993).

From the perspective of the physician, under FFS any interruption of practice may result in complete loss of income (Lee et al., 1975), and FFS does not typically reward for experience or ability (Lee & Butler, 1975). A salary system provides a measure of income security and eliminates constraints on the choice of diagnosis or treatment methods (Lee & Butler, 1975). At

HSC, the implementation of the AFP did not change the method of payment to the paediatricians, as they had always been remunerated through salary through the practice plan. However, before the AFP, the paediatricians were still required to bill OHIP to generate the revenue for the practice plan for distribution as salary. The change to AFP meant the paediatricians did not have to be concerned that the OHIP billings were sufficient to cover the practice plan costs. Another significant change for the paediatrician group was the potential for the paediatricians to perceive that they were no longer independent contractors, but that they were now *employees* of the Hospital. Coyte (1995) suggested that the members of the Department of Paediatrics lost some autonomy and independence with participation in the AFP. However, the Agreement (1990) specifically states “ nothing in this Agreement, including the Minister’s funding, is intended to direct or control the Chairman or the department Physicians in any way in the performance of the Department services, or to create the relationship of employer/employee between the Chairman or any Department Physician and the Minister or the Crown” (p. 6).

FFS has been found to be the most expensive and the least flexible system to administer, largely as a result of the large number of transactions that need to be recorded (Wright, 1991; Lee & Butler, 1975). However, FFS provides a detailed record of activity which can be used for management purposes (MacKenzie et al., 1993). Salary systems are more amenable to rational planning and allocation of physicians (Glaser, 1970), and a salary system is much simpler to administer and therefore is less costly (Nova Scotia, 1993; Reinhardt, 1985; Lee & Butler, 1975).

In addition, an AFP enables hospital management to implement strategic and operational plans

with the medical staff. The FFS system was seen to create conflict between physicians and the hospitals in which they work (British Columbia, 1993). The FFS system “places these physicians in direct conflict with the hospital’s need to meet their global budgets and to ensure a high quality of care” (British Columbia, 1993, p.10). A salary system for physicians would ensure greater consistency among the physicians with the hospital objectives and would enable funders to maintain greater control over expenditures (British Columbia, 1993).

Based on the existing literature, hypothesis five proposes the following relationship between physician satisfaction and the AFP at The Hospital for Sick Children.

H5: Generally, the paediatrician group will express greater satisfaction with the AFP than with the previously existing FFS practice plan arrangements.

CHAPTER 4 RESEARCH METHODS

4.1 Research Design

As discussed in the previous chapter, the hypotheses to be tested in this study are:

H1: The AFP will be associated with decreased clinical utilization by the participating paediatricians.

H2: The AFP will be associated with a change in the type of services the paediatricians provide to their patients and families, with more counseling and consulting services and less procedurally-based services.

H3: The AFP will be associated with increased research activity among the members of the Department of Paediatrics

H4: The AFP will be associated with increased teaching activity among the members of the Department of Paediatrics

H5: Generally, the paediatrician group will express greater satisfaction with the AFP than with the previously existing FFS practice plan arrangements.

There were two components to the study design. The first comprised quantitative analysis of physician clinical utilization at The Hospital for Sick Children (HSC). The research design consisted of an interrupted time series analysis with a non-equivalent, no treatment control. The variables were measured for five years, before (1989/90), immediately after (1991/92), two (1992/93), three years (1993/94) and four years after (1994/95) the change to the alternative funding plan. The year 1990/91 (t2) was omitted from analysis as it was the transition year.

To control for the effects of history the variables were also measured during the study time periods for all paediatricians in the province of Ontario. An attempt was made to use a comparable hospital as a more suitable control. The Children’s Hospital of Eastern Ontario in Ottawa was identified as the only appropriate control hospital, but this organization was not able to provide the required utilization information for the study. Therefore the Ontario paediatricians were used as the control group. Throughout the study period, the majority of Ontario paediatricians continued to bill the Ontario Health Insurance Plan (OHIP) fee-for-service. These data comprise the billing records of the Ontario Health Insurance Plan (OHIP).

The study design is illustrated as follows.

Figure 4.1 Study Design

	t1	t2	t3	t4	t5	t6 ¹¹
HSC	<u>X</u> 1	<u>O</u>	<u>X</u> 2	<u>X</u> 3	<u>X</u> 4	<u>X</u> 5 ¹²
ONTARIO	X1c		X2c	X3c	X4c	X5c

The second component of the study consisted of a satisfaction survey of the paediatricians involved in the AFP. Personal interviews were conducted with a sample of members of the Department of Paediatrics, management staff of the Hospital, and the Dean of Medicine at the University of Toronto. The data from the seven interviews were used to construct a satisfaction questionnaire which was administered to all paediatrician members of the Department of Paediatrics. The survey is included in Appendix 9.3 and includes general physician satisfaction

¹¹t1-1989/90, t2-1990/91, t3-1991/92, t4-1992/93, t5-1993/94, t6-1994/95

¹²X refers to an observation; O refers to the event (establishment of AFP)

questions previously tested and administered to physicians at Sunnybrook Health Science Centre (Hospital Management Research Unit, 1995), as well as new questions designed for this survey. The reliability and validity of the existing questions were established as part of the physician judgement system (MDJS) by Nelson et al. (1992) and Hays et al. (1994). The seven new questions related to the AFP were pretested by two members of the Department of Paediatrics.

The satisfaction survey was administered to all paediatrician members of the Department of Paediatrics in April 1996. In an effort to ensure an adequate response rate, the surveys were accompanied by a letter of explanation and support from the Paediatrician-in-Chief. Follow-up notices were sent as reminders to complete the surveys. The surveys were accompanied by stamped mailing envelopes for direct return to the author at the University of Toronto, and complete confidentiality was assured. The survey questionnaire and survey procedure was reviewed and approved by the University of Toronto Human Subjects Research Committee in February 1996.

The survey data were summarized for the entire paediatrician sample and for two groups of respondents. The first group comprised those physicians who practiced at HSC prior to the implementation of the AFP and had continued practice to the survey date. The second group were those physicians who joined the HSC Department of Paediatrics after the implementation of the AFP. Analysis of the survey data was completed using frequency distributions, cross-tabulated tables and t-tests to establish areas of significant difference between the two groups.

4.2 Sample

The study population included the 236 paediatricians who are members of the Department of Paediatrics at The Hospital for Sick Children and who participate in the alternate funding plan. The quantitative analysis was completed using two different definitions of the AFP population at HSC. The first approach assumed that the HSC Department of Paediatrics was responsible for a volume of services required by the paediatric population served by the Hospital, and included all HSC paediatricians in the Department of Paediatrics. In the second approach the Department paediatricians were classified into 3 different groups based on their tenure within the Department and the analysis only included those paediatricians who reported billing or shadow billing¹³ in 1989/90 pre-AFP, and in the post-AFP years (1991/92, 1992/93, 1993/94 and 1994/95). The satisfaction survey included all 236 physicians on staff, participating in the AFP.

4.3 Sources of Data

A list of 84 OHIP procedure codes with relevance to the practice of paediatrics was established with the Paediatrician-in-Chief, Department of Paediatrics and a member of the Health Records Department at the Hospital for Sick Children. These codes are listed in Appendix 9.4. The billing and shadow billing data were requested from HSC for the members of the Department of Paediatrics for these codes for the years 1987/88, 1988/89, 1989/90, 1991/92, 1992/93, 1993/94 and 1994/95. The HSC data contained actual volumes billed prior to 1990 and volumes shadow-billed after 1990. The shadow-billing was a requirement of the Ministry of Health detailed in the

¹³The HSC paediatricians were required to complete billing records for all patient contacts after the establishment of the AFP. This process is described as shadow billing as billing records are not submitted to OHIP for payment.

AFP agreement. Williams & Helyar (1996) suggested the following advantages of shadow billing: the provision of a profile of the volume and type of services reported and audit of the eligibility of both the beneficiaries and services provided. The principal disadvantage of shadow billing is the potential loss of motivation and accountability (Williams & Helyar 1996) when the records are not tied to finances, suggesting a possible lack of reliability.

The Hospital had always completed the OHIP billings for the physicians on behalf of the practice plan and therefore to the physicians the shadow-billing procedures were no different than their requirements pre-1990, which suggested acceptable reliability in these records. The billing and shadow billing records for all members of the Department of Paediatrics were examined.

Similarly, the Ontario Health Insurance Program provided the volumes billed for these 84 OHIP procedure codes for all paediatricians in Ontario for the same years. The data from OHIP were presented in aggregate for all paediatricians. It was not possible to isolate either individual physicians or groups of physicians associated with hospitals. The billings for the HSC paediatricians were removed from the OHIP billing data by the author for 1989/90 and were not included in the OHIP billing data for the years following the implementation of the AFP.

Thirteen OHIP codes were eliminated from the analysis for the following reasons:

- there were no billings recorded for either HSC or Ontario paediatricians for more than one year of the study years (1 case), or

- the reported volumes for the HSC physicians were greater than the reported volumes for the entire province in the OHIP data base. This data anomaly occurred in 12 cases.

This resulted in a total of 71 OHIP procedure codes for use in the analysis.

4.4 Study Variables

Figure 4.2 Study Variables Illustrated in the Analytical Framework

Adapted from Hombrook & Bekki (1985)

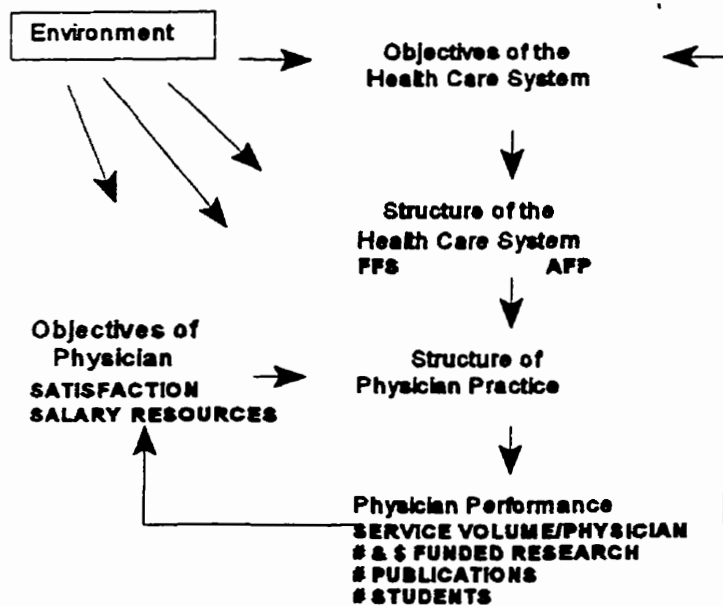


Figure 4.1 illustrates the study variables within the Analytical Framework. The characteristics of the *Environment* and the *Objectives of the Health Care System* were discussed in Chapter 2 and were assumed not to change substantially during the course of the study. The independent variable of funding plan is measured as a variable within the *Structure of the Health Care System*. The *Structure of Physician Practice* did not change during the course of this study. The HSC Department of Paediatrics continued to operate the Departmental practice plan. Although changes may have occurred at the individual practice level among all paediatricians in Ontario, overall there were no global changes to the *Structure of Physician Practice* in the province. The *Physician Performance* dependent variables are service volume per physician, number and dollar value of funded research projects, number of peer-reviewed publications, and number of resident, fellows and graduate students in the Department. The dependent variables relating to the *Objectives of Physician* are physician satisfaction and salary resources.

4.4.1 Dependent Variables

Utilization of Physician Clinical Services - This variable was measured as the number of procedures Ontario Health Insurance Plan (OHIP) billed or shadow-billed, by procedure, by physician, within the Department of Paediatrics. Utilization of physician clinical services has been defined in a number of different ways. Kralj (1995) defined utilization as the actual OHIP payments for the clinical services rendered, adjusted for changes in the OHIP benefits, to measure both changes in volume and in service mix. Utilization, as defined above, was not considered as an appropriate indicator of change in physician clinical activities for the purposes of this study, as it included the financial reimbursement for the services rendered. Revisions to the fee schedule are

made privately by the Ontario Medical Association (OMA) and it is difficult to determine why specific fees are changed (Hurley et al., 1990). Hurley et al. (1990) included three measures of physician utilization: utilization per capita for persons eligible to receive the procedure; utilization per physician; and utilization per bundle of services, (defined as the utilization of a procedure divided by the total utilization of a bundle of consults and visits commonly performed by the specialists who are the primary providers of the procedures) (Hurley et al., 1990). The first and third specifications of utilization were considered inappropriate for this study. The study focused solely on the paediatricians associated with one hospital, The Hospital for Sick Children. Children residing in Metropolitan Toronto may receive their care from physicians associated with The Hospital for Sick Children, however, they may also receive care from physicians associated with other hospitals and therefore the per capita specification of utilization could not be used in this study. The Hospital for Sick Children is a tertiary care paediatric teaching hospital and this designation would likely influence the bundles of services provided and therefore the bundle approach to defining utilization was also not appropriate. This study uses service volume per physician as the definition of utilization, with measurement of the number of procedures billed/shadow-billed to capture the clinical activity of the physicians.

Volume of Physician Research and Teaching Activities - Four measures were used to track the research and teaching activity of the paediatricians. The first two were the number of funded research projects and the level of research funding obtained; the third was the number of publications by staff members; and the fourth was the number of fellows, residents and graduate students active within the Department. To ensure these data were not skewed by a few individuals

within the Department with high levels of research projects, funding or publications, ratios of number of research projects, number of publications, and dollar value of research projects per Department member were calculated (Queen's Health Policy Unit, 1996).

The data for these measures were obtained through secondary data sources (i.e. data collected for administrative purposes and maintained in databases), directly from the Hospital for Sick Children or OHIP databases.

Physician Satisfaction - this was measured through the physician satisfaction survey, presented in Appendix 9.3

4.4.2 Independent Variables

There was one independent variable:

Funding Plan - the independent variable is the funding plan, and can have two values - FFS through the practice plan, or AFP. FFS indicates physician billing of OHIP for services rendered. AFP refers to the global budget plan at HSC.

CHAPTER 5 RESULTS

5.1 Impact of the AFP on Utilization of Physician Services

5.1.1 Total Clinical Utilization

Hypothesis one proposed that the implementation of the AFP would result in decreased clinical utilization for the participating paediatricians. Table 5.1 illustrates the total annual billing/shadowing billing volume, dollar value and mean volume per physician for the paediatrician members of the Department of Paediatrics at The Hospital for Sick Children (HSC) from 1987/88 to 1994/95. The AFP was established in April 1990. Fiscal 1989/90 represents the year immediately preceding the AFP; 1991/92 is one year post-AFP; and 1994/95 is four years post-AFP. This table includes all OHIP procedures reported as billed/shadow billed by all paediatrician members of the HSC Department of Paediatrics. Changes in the OHIP fee schedule over the time period mean that the dollar value figures are not comparable from year to year.

Table 5.1 Total Clinical Utilization for the Members of the Department of Paediatrics, Hospital for Sick Children 1987/88 to 1994/95

	Year	Total Volume of Procedures	Mean Volume of Procedures per Physician	Dollar Value of Procedures
Pre-AFP	1987/88	246,338	1,094.8	\$8,191,810
	1988/89	240,096	1,091.3	\$8,403,859
	1989/90	244,191	1,080.5	\$8,670,023
Transitional Year	1990/91	260,227	1,053.0	\$9,446,471
Post-AFP	1991/92	262,192	1,135.0	\$10,025,381
	1992/93	254,000	1,071.7	\$9,630,908
	1993/94	247,102	1,098.2	\$9,631,793
	1994/95	243,861	1,064.9	\$9,593,043

Source: Hospital for Sick Children Billing/Shadow Billing Records

The fiscal years 1987/88 and 1988/89 are included in the table to show that 1989/90, the year immediately preceding the implementation of the AFP, generally reflects the clinical utilization reported in the previous two years. This enables the year 1989/90 to be used as the baseline year for the analysis of the impact of the AFP. Table 5.1 reflects a 0.1% decrease in total volume of procedures between 1989/90 and 1994/95, four years after implementation of the AFP. There was an increase of 7.4 percent between 1989/90 and 1991/92, immediately following the implementation of the AFP. However, the volume decreased by 7.0 percent between 1991/92 and 1994/95.

In 1989/90 226 physicians billed OHIP through the Hospital for Sick Children Department of Paediatrics. In 1991/92 there were 231 physicians, in 1993/94 225 physicians, and in 1994/95 229 physicians reporting shadow billings in the Department of Paediatrics. This resulted in the illustrated changes in the per physician procedure volume.

Further analysis revealed different utilization by the physicians who joined the Department of Paediatrics after implementation of the AFP as compared to those physicians who were members of the Department prior to the AFP. Table 5.2 illustrates three physician groups within the Department of Paediatrics. Group I includes physicians with billings recorded only in 1989/90. Group II includes physicians with billings in 1989/90, pre-AFP, and in at least three of the study years post-AFP; and Group III includes physicians who joined the Department after the AFP.

Table 5.2 Physician Group Assignment in Relation to Years in Which Billings/Shadow Billings were Reported, HSC Department of Paediatrics

Physician Group		89/90	91/92	92/93	93/94	94/95
Group I 1989/90 Billings Only	# of Physicians	20	N/A	N/A	N/A	N/A
	# of Procedures/Physician	672.4	N/A	N/A	N/A	N/A
	Annual Volume	13,448	N/A	N/A	N/A	N/A
Group II Billings 1989/90 - 1994/95	# of Physicians	206	203	190	171	166
	# Procedures/Physician	1,120.1	1,173.8	1,134.9	1,161.4	1,144.4
	Annual Volume	230,743	238,289	215,627	198,596	189,970
Group III Billings Post AFP (1991/92-1994/95)	# of Physicians	0	28	47	54	63
	# of Procedures/Physician	N/A	853.7	816.4	898.3	855.4
	Annual Volume	N/A	23,903	38,373	48,506	53,891
Total Department of Paediatrics	# of Physicians	226	231	237	225	229
	# of Procedures/Physician	1,080.5	1,135.0	1,071.7	1,098.2	1,064.9
	Annual Volume	244,191	262,192	254,000	247,102	243,861

Source: Hospital for Sick Children Billing/Shadow Billing Records

Table 5.2 demonstrates that those physicians who joined the Department after the establishment of the AFP reported fewer procedures per physicians as compared to the physicians who had worked in the Department prior to the AFP. Figure 5.1 illustrates the percentage of the total utilization contributed by Groups II and III from 1989/90 to 1994/95. Group I was eliminated as these physicians only participated in 1989/90. This figure illustrates that the Group II physicians contributed the large majority of the clinical utilization from 1989/90 to 1994/95. However the percentage contribution of the Group II physicians decreased from 94% in 1989/90 to 78% in 1994/95 as the number and per physician procedure volume of the Group III physicians increased during this time period.

Figure 5.1 Clinical Utilization of Group II & III Paediatricians as a Percentage of Clinical Utilization of the Entire HSC Department of Paediatrics, 1989/90 to 1994/95

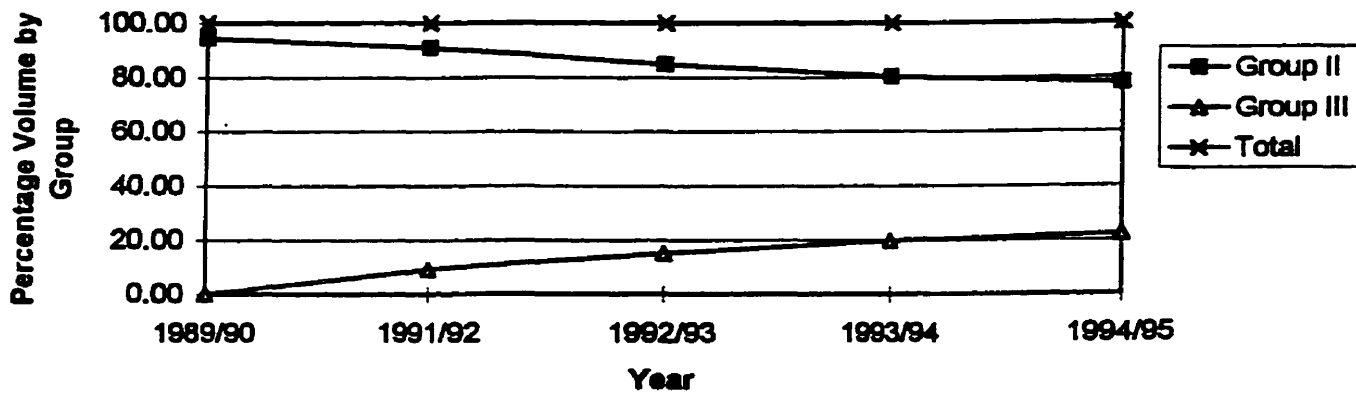
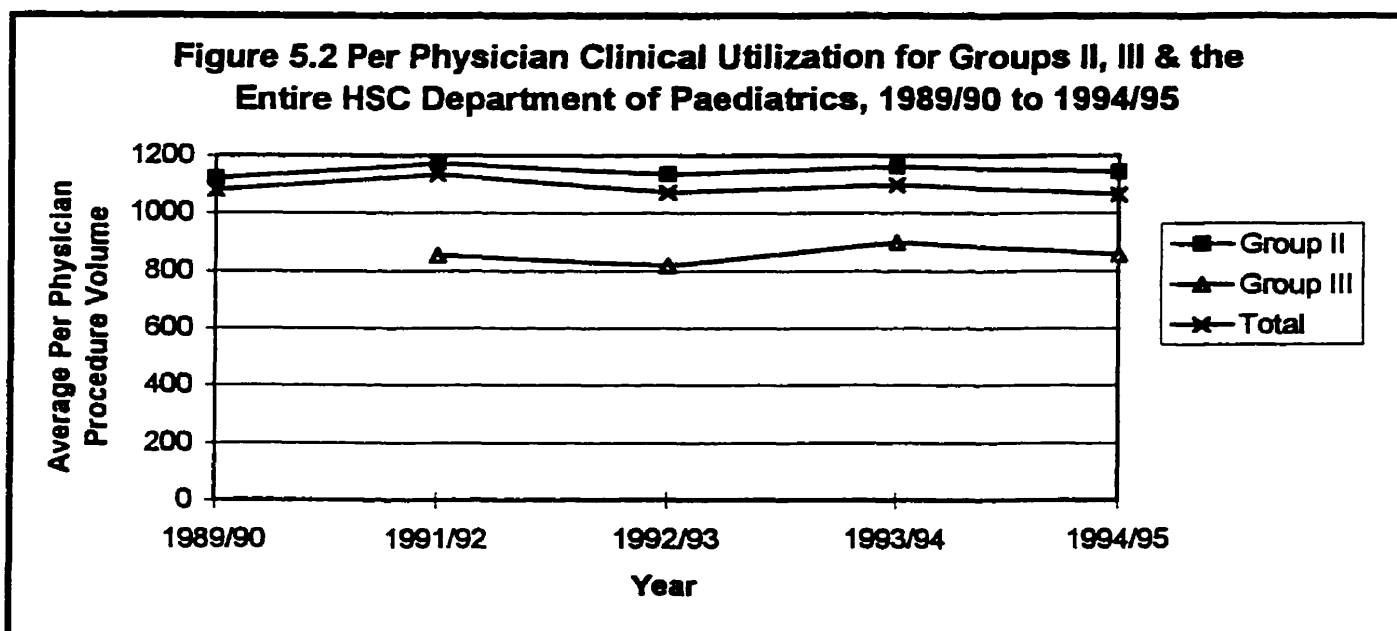


Figure 5.2 presents the average annual clinical utilization per physician for Groups II and III, and the entire Department of Paediatrics. This figure illustrates the relatively stable per physician utilization between 1989/90 and 1994/95 of the Group II and Group III physicians. At an average of 1,146.9 procedures per physicians, the Group II physicians displayed greater per physician clinical utilization throughout the study period than the Group III physicians, with average of 856.0 procedures per physician.



Analysis of the billing/shadow billing patterns of Group II and Group III physicians from 1991/92 to 1994/95 was completed using a two-factor repeated measures model analysis of variance. The two independent factors were: GROUP (between factor), and TIME (within or repeated factor). This analysis considered the variance within the mean number of procedures by physician either OHIP billed or shadow billed by the Group II paediatricians with the variance in the mean number of procedures billed or shadow billed by the Group III paediatricians from 1991/92 to 1994/95. The average of the existing data elements was used to fill in missing data. The SPSS MANOVA program was used to complete the analysis and the ANOVA summary table (Table 5.3) is presented below. The ANOVA tests the hypothesis that the means of the two groups are equal. With an F value of 1.7 this analysis suggests that at $p < 0.05$ the two groups were not significantly different in their clinical utilization.

**Table 5.3 ANOVA Summary Table for Comparison of Per Physician
Clinical Utilization of Group II and III Paediatricians**

SOURCE	SS	df	MS	F	Sig of F
Between					
WITHIN + RESIDUAL	2028290568	225	9014624.7		
GROUP	10495743.33	1	10495743	1.77	.185
Within					
WITHIN + RESIDUAL	227735298.6	675	337385.63		
TIME	171339.79	3	57113.26	0.17	0.916
GROUP BY TIME	1905253.11	3	635084.37	1.88	0.131

In other words, although the Group III physicians who joined the Department of Paediatrics after the implementation of the AFP had lower reported clinical utilization, the large variation in per physician clinical utilization in Group III was not statistically different from those physicians who participated in the implementation of the AFP (Group II). Throughout the study period, the Group I, Group II and Group III physicians provided a volume of clinical service to the population, with increasing utilization by the Group III physicians as the utilization of the Group II physicians decreased. The ANOVA results suggest that all HSC paediatricians should be included in further utilization analysis.

The per physician utilization of seventy-one of the OHIP (listed in Appendix 9.4) procedures were further analyzed. As described in Section 4.3 (page 46), utilization data were requested for 84 OHIP procedure codes, representing the most commonly used codes by paediatricians in Ontario.

These data were reviewed and 13 codes were eliminated from the analysis for the following reasons:

- there were no billings recorded for either HSC or Ontario paediatricians for the study years (1 case), or
- the reported volumes for the HSC physicians were greater than the reported volumes for the entire province in the OHIP data base. This data anomaly occurred in 12 cases.

This resulted in a total of 71 OHIP procedure codes for use in the analysis. Table 5.4 presents the volume of these 71 procedures for 1989/90 to 1994/95. The 71 procedures account for over 82% of the total volume of procedures, except 1994/95 (78.5%), and therefore comprise sufficient volume for further analysis.

Table 5.4 Total Clinical Utilization for the Members of the Department of Paediatrics, Hospital for Sick Children for the 71 Study Procedures

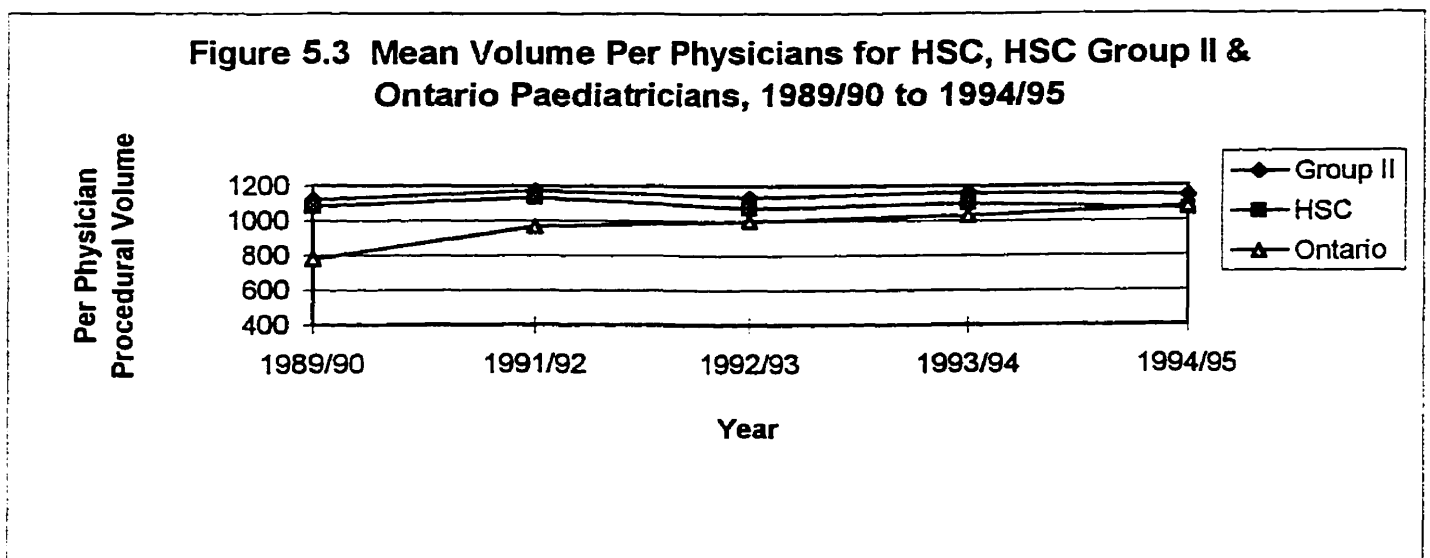
Year	Total Volume of Procedures	Volume for 71 Study Procedures (% change from 1989/90)	Percentage of Total Procedure Volume
1989/90	244,191	200,904	82.3%
1991/92	262,192	232,523 (15.6%)	88.7%
1992/93	254,000	209,219(4.1%)	82.4%
1993/94	247,102	206,710 (2.9%)	83.7%
1994/95	243,861	191,518(-4.7%)	78.5%

Source: Hospital for Sick Children Billing/Shadow Billing Records

The total volume for the 71 study procedures for the HSC paediatricians also demonstrated the same pattern of increased volume (15.6%) from 1989/90 to 1991/92, with decreased volume of 17.6% between 1991/92 and 1994/95, and 4.7% fewer procedures in 1994/95 than reported in 1989/90. However, this change in clinical utilization by the HSC AFP physicians may not be

related to the implementation of the AFP, but may reflect a main effect of history, such as changing practice for all paediatricians in Ontario. To analyze this possibility, the utilization of the 71 study procedures was obtained for all paediatricians in Ontario. Over the study time frame (1989/90 to 1994/95) the Ontario paediatricians, (excluding the HSC paediatricians), reported a 16% increase for the 71 study procedures (9,264,804 in 1989/90 to 10,781,453 in 1994/95). The reported clinical utilization of the HSC paediatricians decreased slightly after 1991/92 for the same 71 OHIP procedures.

Figure 5.3 presents the mean procedure volume per physician for the HSC, HSC Group II and Ontario paediatricians. The per physician clinical utilization for Ontario paediatricians increased throughout this period, while the HSC paediatricians had a fluctuating pattern. The total HSC per physician volume decreased below that of the Ontario paediatricians in 1994/95. In comparison, the HSC Group II physicians (those paediatricians working at HSC prior to, during and following the AFP) demonstrated consistently higher per physician volumes.



Hypothesis one, that the AFP will result in decreased clinical utilization by the participating paediatricians, was tested statistically using a two-factor multifactorial analysis of variance. This analysis considered the variance within the mean number of per physician procedures either OHIP billed or shadow billed by the Hospital for Sick Children paediatricians with the variance in the mean number of per physician procedures billed to OHIP by all Ontario paediatricians (excluding the HSC paediatricians) for the same time period. The SPSS MANOVA program was used to complete the analysis and the ANOVA summary table is presented below.

Table 5.5 ANOVA Summary Table for the Comparison of the HSC Paediatricians to Ontario Paediatricians

EFFECT - AFP	Value	Exact F	Hypoth df	Error df	Sig of F	
Multivariate Tests						
Pillais	0.04028	1.12487	5.00	134.00	0.350	
Hotellings	0.04197	1.12487	5.00	134.00	0.350	
Wilks	0.95972	1.12487	5.00	134.00	0.350	
	Hypoth SS	Error SS	Hypoth MS	Error MS	F	Sig of F
Univariate F Tests						
pp8990	1053742.02	42959092.4	1053742.02	311297.771	3.38500	.068
pp9192	1199922.54	50350404.8	1199922.54	364858.013	3.28874	.072
pp9293	1333675.70	58427130.9	1333675.70	423385.006	3.15003	.078
pp9394	1223549.38	53208334.2	1223549.38	385567.639	3.17337	.077
pp9495	1270125.31	55373343.0	1270125.31	401256.109	3.16537	.077

The ANOVA tested the hypothesis that the means of the two groups were equal. At a level of significance of $p < 0.05$ the null hypothesis could not be rejected, indicating that the clinical utilization of the HSC paediatrician group participating in the AFP was not significantly different from the clinical utilization of the Ontario paediatricians paid FFS. This analysis was completed by procedure, with a sample of 71 procedures. The power analysis indicated that the effect size was

very small at 0.040¹⁴ and the study power was 0.52. The power may have been increased with a larger sample size, however the number of procedures was limited by the OHIP billing codes and the number of procedures for which reliable data were available. Changing the level of significance to $p < 0.10$ increased the power to 0.71, but the F values were still not significant.

The same multifactorial analysis of variance was completed comparing those paediatricians at HSC who were members of the Department of Paediatrics and who had billing/shadow billing data pre and post-AFP with the Ontario paediatricians. This analysis was limited to the Group II physicians who had billing/shadow billing reported in 1989/90 and in at least three of the post-AFP study years (1991/92, 1992/93, 1993/93 and 1994/95). The SPSS MANOVA program was used to complete the analysis and the ANOVA summary table is presented below.

Table 5.6 ANOVA Summary Table for the Comparison of the HSC Pre & Post-AFP Paediatricians to Ontario Paediatricians

EFFECT - AFP	Value	Exact F	Hypoth df	Error df	Sig of F	
Multivariate Tests						
Pillais	0.06824	1.99196	5.00	136.00	0.084	
Hotellings	0.07323	1.99196	5.00	136.00	0.084	
Wilks	0.93176	1.99196	5.00	136.00	0.084	
	Hypoth SS	Error SS	Hypoth MS	Error MS	F	Sig of F
Univariate F Tests						
pp8990	5.817E+11	2.102E+13	5.817E+11	1.502E+11	3.87	.051
pp9192	6.849E+11	2.536E+13	6.849E+11	1.811E+11	3.78	.054
pp9293	7.704E+11	3.027E+13	7.704E+11	2.162E+11	3.56	.061
pp9394	7.523E+11	2.912E+13	7.523E+11	2.080E+11	3.62	.059
pp9495	7.914E+11	3.113E+13	7.914E+11	2.223E+11	3.56	.061

¹⁴Cohen (1977) suggested that an effect size of 0.20 is small, 0.50 is medium and 0.80 is large.

The ANOVA tested the hypothesis that the means of the two groups were equal. At a level of significance of $p < 0.05$, with a small effect size of 0.061, the observed power was 0.58. This was deemed to be insufficient power for detecting a type II error and the level of significance was changed to $p < 0.10$, with observed power of 0.77. At $p < 0.10$, the clinical utilization of the HSC Group II paediatricians participating in the AFP was significantly different from the clinical utilization of the Ontario paediatricians. However, as discussed in detail later, this difference may not be associated with the establishment of the AFP. This relationship is illustrated in Figure 5.3, page 59.

5.1.2 Clinical Utilization by Service Type

The second study hypothesis was that the AFP would result in a change in the type of services the paediatricians provided to their hospital patients and families, with more counselling and consulting services and less procedurally based services. The services provided by the HSC paediatricians were categorized in accordance with Hurley et al. (1996) as: major consultations, intermediate assessments, minor assessments, hospital care, and diagnostic and therapeutic procedures. To better reflect the practice of paediatrics, the surgical procedure category used by Hurley was replaced with a counselling procedures category. The author allocated the fee schedule codes to the categories and the allocation is included in Appendix 9.5. Appendix 9.6 illustrates the OHIP procedure codes in each of the service categories grouped according to the change recorded for the study period.

Figure 5.4 illustrates the change in share of fee service category from 1989/90 to 1994/95 for the procedures billed/shadow billed by the HSC AFP paediatricians, and Figure 5.5 illustrates the same data for the Ontario paediatricians (excluding the HSC paediatricians).

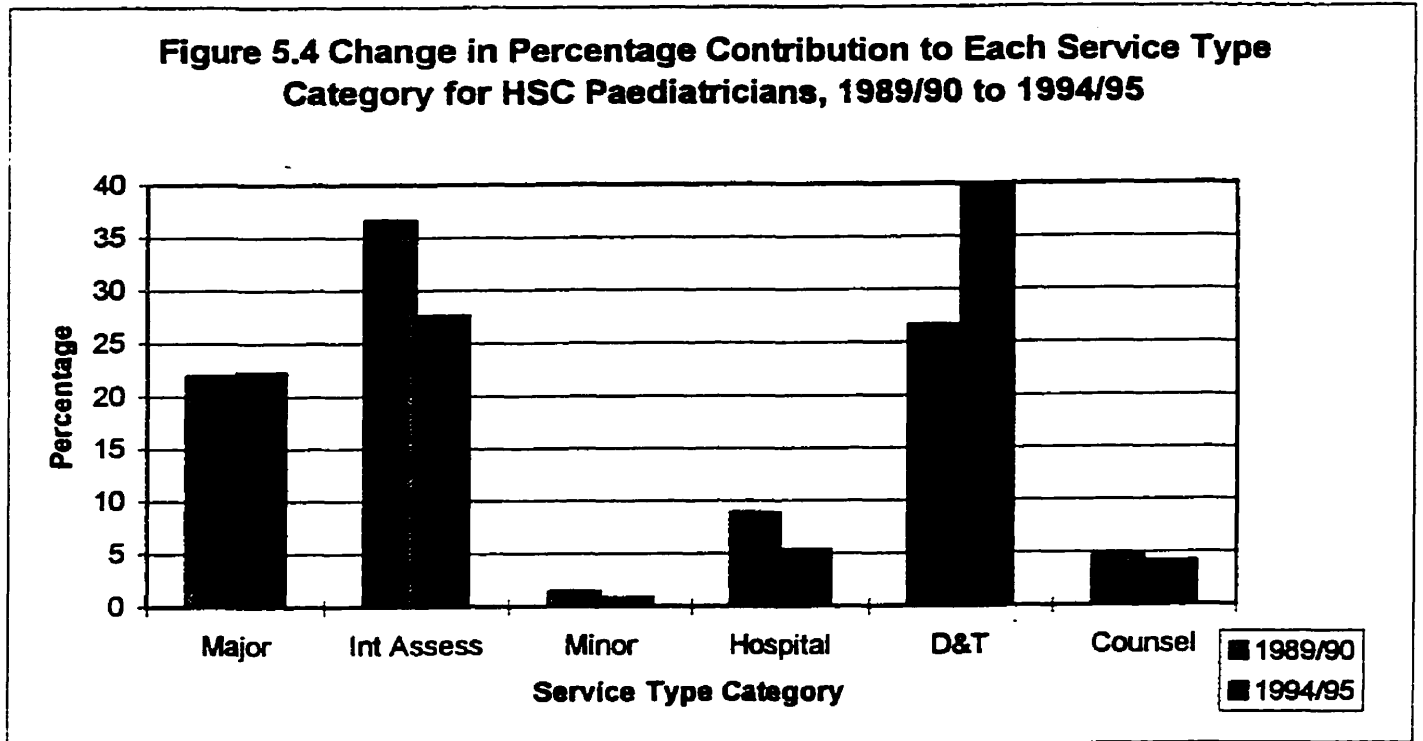


Figure 5.4 shows that for the HSC paediatricians procedures within the categories of intermediate and minor assessment, hospital visits and counselling decreased between 1989/90 and 1994/95, while diagnostic and therapeutic procedures showed increased utilization in this time period. In comparison, as illustrated in Figure 5.5, the Ontario paediatricians reported relatively stable patterns of service type utilization. There was little appreciable change in the service type between 1989/90 and 1994/95 for the Ontario paediatricians. However, the percentage of diagnostic and

therapeutic procedures for this group comprised the largest proportion of the service volume, with a small increase of 0.8 points recorded between 1989/90 and 1994/95.

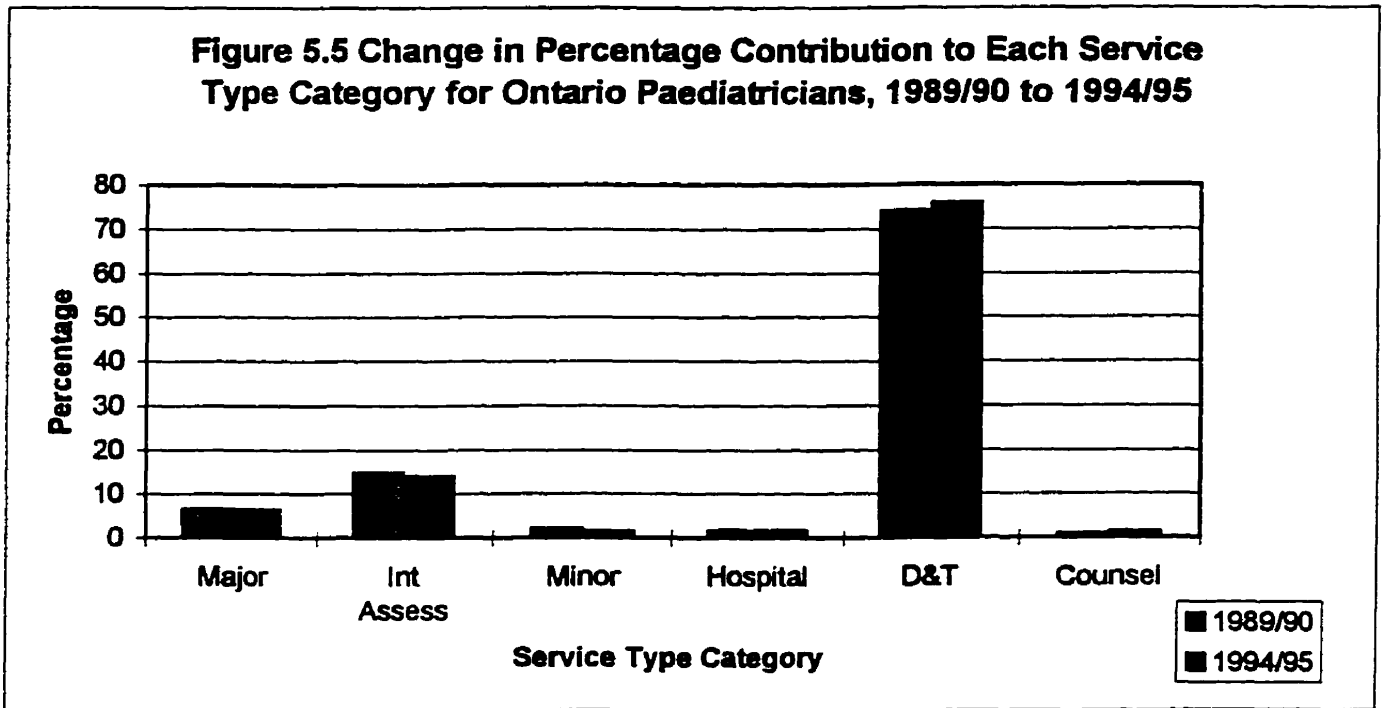


Table 5.7 illustrates the change in the volume share of each of the service categories from 1989/90 to 1994/95 for the HSC and Ontario paediatricians.

**Table 5.7 Service Category as a Percentage of Total Clinical Utilization
Hospital for Sick Children Department of Paediatrics
and Ontario Paediatricians 1989/90 and 1994/95**

Service Type Category	HSC 1989/90	HSC 1994/95	Absolute Change in Volume 1989/90 - 1994/95	Ontario 1989/90	Ontario 1994/95	Absolute Change in Volume 1989/90 - 1994/95
Major consultation	21.9	22.2	0.3	6.5	6.3	-0.2
Intermediate assessment	36.6	27.6	-9.0	14.7	13.9	0.8
Minor assessment	1.4	0.8	-0.6	2.1	1.5	0.6
Hospital care	8.8	5.3	-3.5	1.7	1.7	0
Diagnostic & therapeutic	26.6	40.0	13.4	74.1	75.3	-1.2
Counselling	4.7	4.1	-0.6	0.9	1.3	-0.4
Total	100	100		100	100	

Source: Hospital for Sick Children OHIP Billing/Shadow Billing Records

Table 5.7 illustrates that over the study time period the absolute volume decreased for intermediate and minor assessments, hospital care and counselling procedures, with a combined total decrease of 13.7 points. This was balanced by the 13.4 point increase in diagnostic and therapeutic procedures (and 0.3 point increase in major consultations). This trend was apparent in 1991/92, immediately after implementation of the AFP, with a 7.8 point increase in diagnostic and therapeutic services, with decreases in all other service categories. These changes were not seen for the Ontario paediatricians (excluding the HSC paediatricians).

The recorded decrease in hospital care services was likely associated with the general reduction in inpatient care at HSC. The following table illustrates the inpatient cases and outpatient visits for

the HSC Department of Paediatrics from 1989/90 to 1993/94.

**Table 5.8 Number of Inpatient and Outpatient Cases,
Hospital for Sick Children Department of Paediatrics 1989/90 to 1993/94**

YEAR	1989/90	1991/92	1992/93	1993/94	1994/95
Admissions Department of Paediatrics	7,915	7,996	7,326	7,256	7,489
Total Admissions HSC		18,908	17,074	16,708	16,637
% Total HSC Cases		42.2	42.9	43.4	45.0
Outpatient Visits	67,766	72,402	75,103	75,166	74,894
Emergency Visits	53,452	52,832	48,873	48,610	51,000
Total Outpatient/Emergency Visits HSC	251,154	282,856	288,922	283,741	263,065
% Total HSC Outpatient Visits	48.3	44.3	42.9	43.6	47.9

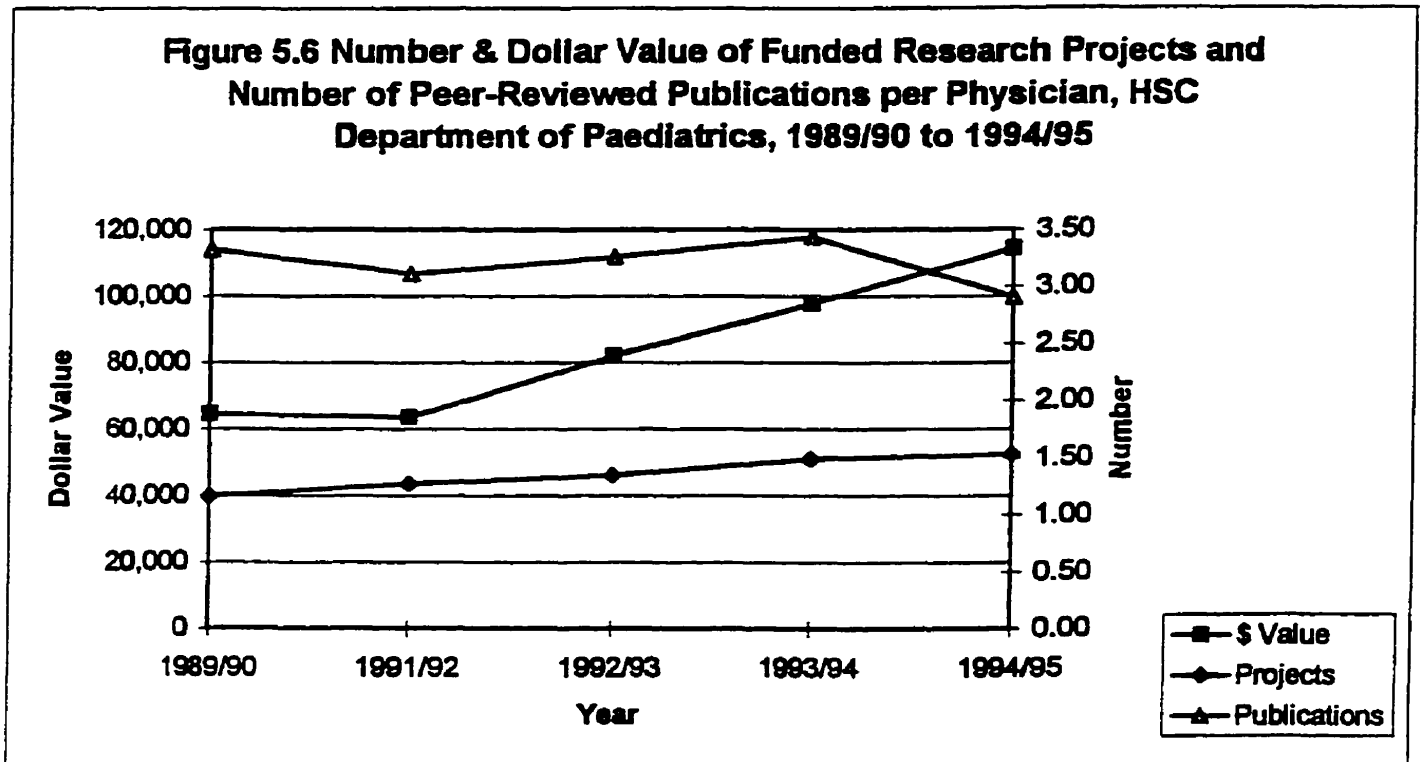
Source: The Hospital for Sick Children Health Records Department

There was a five percent decrease in the total inpatient cases for the Department of Paediatrics from 1989/90 to 1994/95. However the percent of total inpatient cases related to the Department of Paediatrics was relatively stable over the years, suggesting a hospital-wide decrease in inpatient activity. In comparison, the outpatient activity of the Department of Paediatrics decreased as a percentage of the total outpatient activity of HSC, from 48.3% of the total hospital outpatient caseload in 1989/90 to 43.6% in 1993/94. Increased emergency visits in 1994/95 increased the percentage of outpatient activity of the Department of Paediatrics in 1994/95.

5.1.3 Research Activity

The next figure, 5.6, illustrates the annual change in both the number and dollar value of the funded research projects and the annual number of peer-reviewed publications per physician for the members of the HSC Department of Paediatrics. There was a 28% increase in the number and

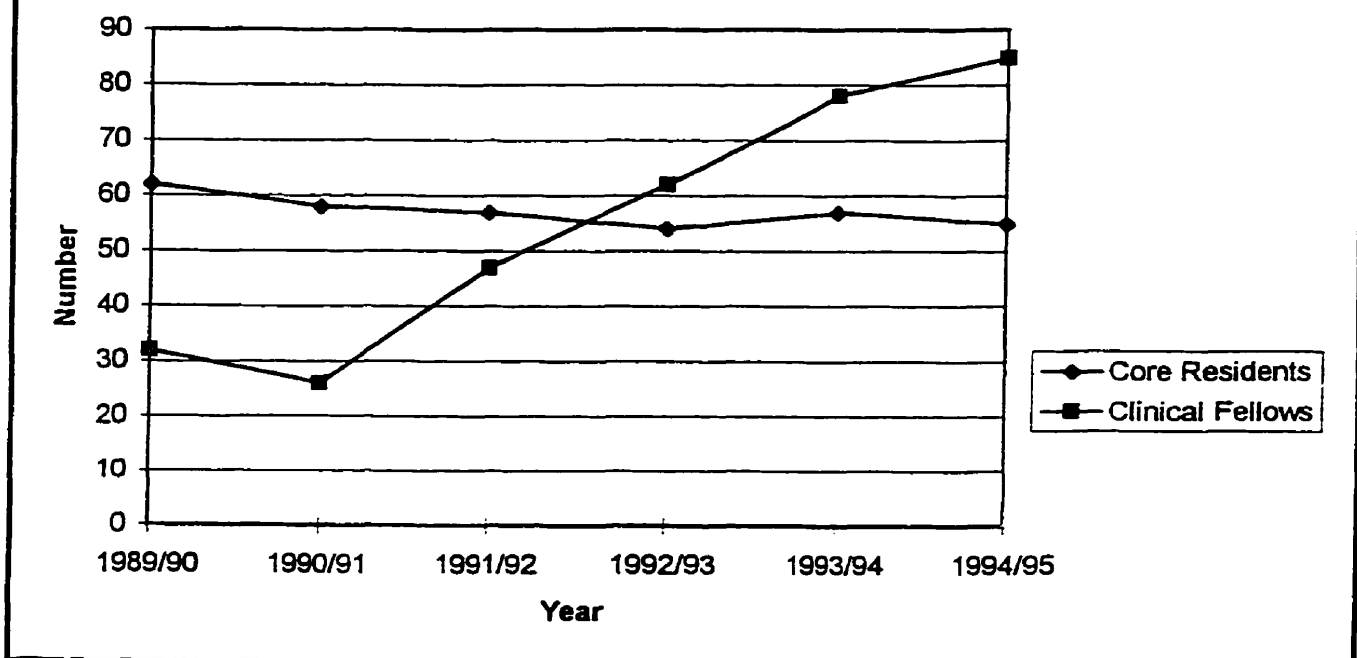
a 52% increase in the dollar value of research projects from 1989/90 to 1994/95. While the number of peer-reviewed publications decreased from 1989/90 to 1994/95, an increasing trend was recorded from 1989/90 to 1993/94.



5.1.4 Teaching Activity

Hypothesis four was that the AFP would be associated with increased teaching activity among the members of the Department of Paediatrics. Figure 5.7 presents the annual number of core residents and clinical fellows for the HSC Department of Paediatrics from 1989/90 to 1994/95.

**Figure 5.7 Core Residents & Clinical Fellows
HSC Department of Paediatrics, 1989/90 to 1994/95**



As illustrated, the number of core residents decreased by 11% from 1989/90 to 1993/94. Review of each of the divisions revealed that Dermatology, Infectious Diseases and Medical Education reported fewer students over this time period. This decrease was balanced by increases in the number of students in Chest Diseases (60%), Clinical Genetics (106%), Clinical Pharmacology & Toxicology (66%), Endocrinology (250%), Haematology/Oncology (67%), Immunology/Allergy (171%), Neonatology (31%), and Rheumatology (167%). During this same time period, the number of clinical fellows increased by 166% (from 32 fellows in 1989/90 to 85 fellows in 1994/95).

5.2 Impact of the AFP on Physician Satisfaction

A physician satisfaction survey was administered to all members of the Department of Paediatrics in April 1996. The survey instrument is included in Appendix 9.3. The questionnaire took approximately 15 to 20 minutes to complete. Three hundred and forty surveys were sent through the internal mail system of The Hospital for Sick Children to Department members. One hundred and five surveys were not eligible as they were sent to non-physician members of the Department or to individuals who did not participate in the AFP, resulting in a total of 236 eligible surveys. One hundred and twenty three surveys were returned completed for an overall response rate of 52%. This is comparable to the response rates of between 50 and 75% recorded for hospital physician surveys (Nelson et al., 1990) and is greater than the 32% response rate for a physician survey reported by Deckard (1995).

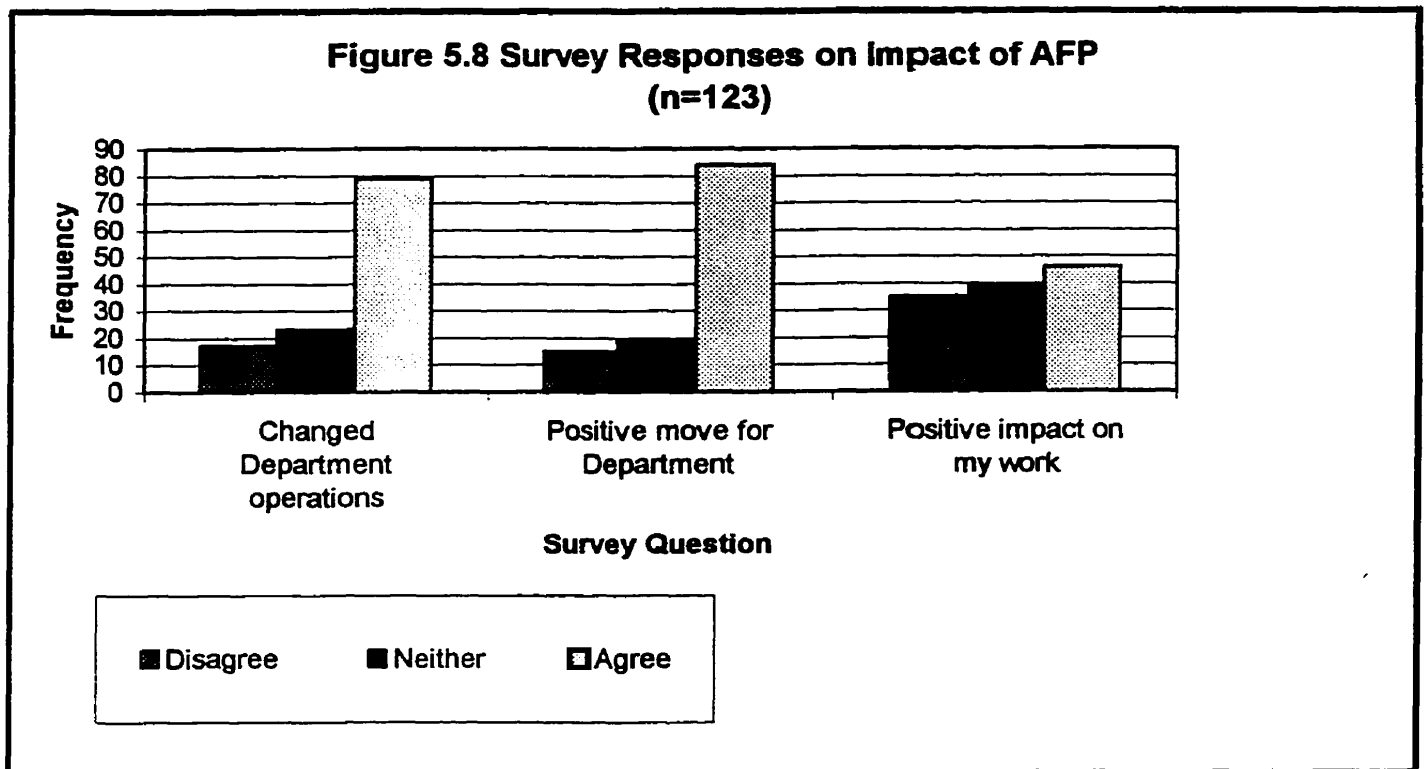
The satisfaction survey focused on three aspects of physician satisfaction: global satisfaction (i.e., satisfaction with practice at hospital overall), availability of resources (i.e., resources for teaching, research and clinical practice, as well as compensation), and facet-specific satisfaction (e.g., satisfaction with administration). The survey focused specifically on the impact of the AFP on the organization and on the practice, research and teaching activities of the physicians. The job satisfaction questions were developed by the Quality Research Group of the Department of Health Administration, University of Toronto. These questions were not pre-tested as they had been successfully tested and administered to physicians within another Toronto teaching hospital. The seven new questions pertaining specifically to the AFP were reviewed for clarity with the Paediatrician-in-Chief and Administrative Director of the Department of Paediatrics.

5.2.1 Demographics of the Survey Respondents

One hundred and twenty-three completed surveys were received. Twenty-eight percent of the respondents were female. The majority of the respondents were in the 40 to 49 year age range, with 65% of respondents age 40 to 59 years. Thirty-five percent of the respondents had worked/practised at HSC for more than 16 years. Only three percent had been at HSC for less than one year.

The respondents were compared to the nonrespondents and there were no differences in the division or tenure between the HSC physicians who responded to the survey and those who did not respond. There was a difference in the gender of the respondents as compared to the nonrespondents. While 28% of the respondents were female, 43% of the nonrespondents were female, suggesting that fewer females than males responded to the survey. The Ontario Physician Human Resources Data Centre reported that in 1994 in Ontario there were a total of 750 paediatricians, with 35% female. It appears that the respondent population under represents female paediatricians. Within the nonrespondent group, 50% of the females practised full time while only 34% of the males practised full time. Whereas among respondents, 77% of the females and 64% of the males practised full time. The 1993 Canadian Medical Association Physician Resource Survey reported that female physicians spent twice as many hours maintaining their households and four times as many hours on child care compared to male physicians (Buske 1997). It is possible that the female physicians may have had greater time constraints which limited their ability to complete the survey.

The hypothesis tested by the survey was that generally, the paediatrician group would express greater satisfaction with the AFP than with the previously existing FFS practice plan arrangements. As illustrated in Figure 5.8, the survey respondents believed that the AFP had an impact on the Department of Paediatrics.



Sixty-six percent of the survey respondents indicated that the AFP had changed the operations of the Department of Paediatrics, while 14% felt the AFP had not changed the Department operations. Seventy-two percent of the survey respondents indicated that the establishment of the AFP had been a positive move for the Department of Paediatrics as a whole. However, 61% of

the respondents felt that the establishment of the AFP did not have a positive impact on their ability to complete their work within the Department.

The survey results were further analyzed by gender, age and departmental tenure of the respondents, with t-tests completed to determine if there were areas where differences in responses could be considered statistically significant. The survey responses of those physicians who joined the Department after implementation of the AFP were compared with the physicians who participated in the implementation of the AFP and various aspects of the satisfaction of respondents were also analyzed.

5.2.2 Analysis by Demographic Characteristics

There were two areas where the responses of the females appeared to be less positive than the responses of the males. In the first area, female respondents indicated the support provided by the Hospital for their career aspirations was only fair¹⁴, while the male respondents reported fair to good support. In the second area the female respondents indicated less appropriate and meaningful involvement in the administration of the department than the male respondents¹⁵. However, with t-values of -1.73 and -1.81 (respectively) the differences were not significant at $p < 0.05$.

¹⁴The wording of the question was “The following section asks about your opinions of The Hospital for Sick Children as a place to practice. Please rate each area on the following five point scale (Poor, Fair, Good, Very Good, Excellent): Support for career: Hospital support for the career aspirations of individual physicians.

¹⁵Physician Involvement in Administration of the Department: The appropriateness and meaningfulness of physician involvement in administration of the Department of Paediatrics.

As illustrated in Table 5.9, the older physicians tended to be least positive about the impact of the AFP on their ability to complete their work. However, Chi square analysis indicated that the differences were not significantly significant at $p < 0.05$ (Table 5.11).

Table 5.9 Age Group of Respondent Cross Tabulated with Response to Questions on Departmental and Personal Benefit of the AFP

	Easier for department to achieve goals				Positive impact on my ability to complete work				
Age Group	Disagree # (%)	Neutral # (%)	Agree # (%)	Total	Age Group	Disagree # (%)	Neutral # (%)	Agree # (%)	Total # (%)
30 - 39	3 (11)	7 (27)	16 (62)	26	30 - 39	6 (22)	11 (41)	10 (37)	27
40 - 49	8 (18)	9 (20)	28 (62)	45	40 - 49	14 (31)	11 (25)	20 (44)	45
50 - 59	6 (20)	7 (23)	17 (57)	30	50 - 59	9 (30)	9 (30)	12 (40)	30
60+	2 (18)	3 (27)	6 (55)	11	60+	3 (25)	6 (50)	3 (25)	12
Total	19 (17)	26 (23)	67 (60)	112	Total	32 (28)	37 (33)	45 (39)	114

Source: HSC Survey

As illustrated in Table 5.10, individuals with longer tenure in the Department appeared to be less positive about the impact of the AFP on both the operations of the Department and their personal work. Chi square analysis (Table 5.11) indicated no significant difference for the responses to the question "The AFP has made it easier for the Department of Paediatrics to achieve the goals in clinical care, teaching and research". However, as illustrated in Table 5.11 at $p < 0.05$ the Likelihood Ratio and the Linear-by-Linear Association suggested that the responses of those individuals with shorter tenure to the question "The AFP has had a positive impact on my ability to complete my work", were statistically significantly different from the responses of those individuals with longer tenure.

Table 5.10 Tenure of Respondent Cross Tabulated with Response to Questions on Departmental and Personal Benefit of the AFP

Tenure in Department	Easier for department to achieve goals				Positive impact on my ability to complete work				
	Disagree # (%)	Neutral # (%)	Agree # (%)	Total	Tenure in Department	Disagree # (%)	Neutral # (%)	Agree # (%)	Total
Less than 5 years	2 (8)	7 (28)	16 (64)	25	Less than 1 yr	3 (11)	9 (35)	14 (54)	26
6 - 15 yrs	7 (15)	10 (21)	31 (64)	48	6 - 15 yrs	13 (27)	15 (31)	20 (42)	48
16 + yrs	9 (24)	9 (24)	20 (52)	38	16 + yrs	16 (41)	13 (33)	10 (26)	39
Total	18 (16)	26 (23)	67 (61)	111	Total	32 (28)	37 (33)	44 (39)	113

Table 5.11 Summary of Chi-Square Analysis

Analysis	Chi-Square	Value	DF	Significance
The AFP has made it easier for the Department of Paediatrics to achieve the goals in clinical care, teaching and research by Age Group	Pearson	4.43962	8	0.815
	Likelihood Ratio	4.17108	8	0.841
	Linear-by-Linear Association	0.73169	1	0.392
The AFP has had a positive impact on my ability to complete my work by Age Group	Pearson	6.69940	8	0.569
	Likelihood Ratio	6.67833	8	0.572
	Linear-by-Linear Association	1.92765	1	0.165
The AFP has made it easier for the Department of Paediatrics to achieve the goals in clinical care, teaching and research by Tenure	Pearson	3.27661	4	0.513
	Likelihood Ratio	3.26623	4	0.514
	Linear-by-Linear Association	1.38169	1	0.240
The AFP has had a positive impact on my ability to complete my work by Tenure	Pearson	8.62952	4	0.071
	Likelihood Ratio	9.58356	4	0.048
	Linear-by-Linear Association	7.86950	1	0.005

Analysis of the response differences between those individuals who joined the Hospital medical staff after the implementation of the AFP and those individuals who were on staff before the AFP revealed that those individuals on staff prior to the AFP were significantly less positive ($p < 0.05$) about the impact of the AFP on their ability to complete their work.

Table 5.12 highlights the mean responses and level of significance for t-tests for selected aspects of satisfaction compared by tenure in the Department pre AFP with tenure in the Department after the implementation of the AFP. Mean pre-AFP refers to the mean of the responses of those individuals who were members of the Department of Paediatrics prior to the implementation of the AFP. Mean post-AFP refers to the mean response for those survey respondents who joined the Department of Paediatrics after implementation of the AFP. As illustrated in Table 5.12, the paediatricians who participated in the Department prior to the AFP were only different on one component, i.e. they were significantly less likely to indicate that the AFP had a positive impact on their ability to complete their work, in comparison to those paediatricians who joined the Department after the AFP.

Table 5.12 Satisfaction Scores Compared by Tenure in the Department

Aspect of Satisfaction	Mean Pre-AFP	Mean Post-AFP	Significance
The implementation of the AFP was a positive move for the Department of Paediatrics*	5.23	5.44	0.565
The AFP has made it easier for the Department to achieve the goals in clinical care, teaching and research*	4.81	5.16	0.291
The AFP has had a positive impact on my ability to complete my work*	3.95	4.77	0.024
If I were considering joining this organization today, the AFP would be a positive factor in my decision*	4.45	4.77	0.380
I am more positive about my involvement with this organization since the implementation of the AFP*	3.66	4.19	0.181
For me this is the best of all possible organizations for which to work*	4.83	5.30	0.153
Overall, the quality of this hospital as a place to practice medicine**	3.63	3.63	0.981
Overall, the support and recognition given to physicians at HSC**	3.08	3.26	0.424
Extent to which this hospital is a comfortable place to practice, free from operational and bureaucratic difficulties**	2.37	2.63	0.241

*Scale: 1. Strongly disagree; 2. Moderately disagree; 3. Slightly disagree; 4. Neither agree nor disagree; 5. Slightly agree; 6. Moderately agree; 7. Strongly agree.

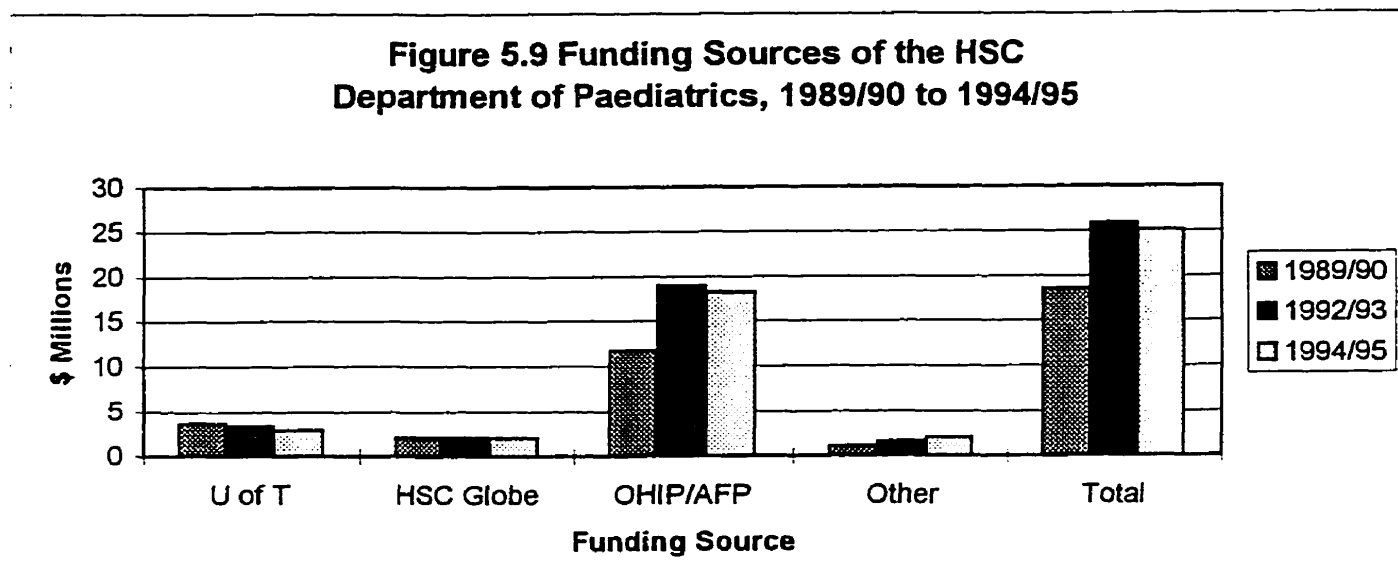
**Scale: 1. Poor; 2. Fair; 3. Good; 4. Very Good; 5. Excellent.

Overall the respondents were relatively positive about the Hospital for Sick Children as a place to practice medicine. Eighty-six percent rated the hospital as a good, very good, or excellent hospital in which to practice medicine

5.3 Impact of the AFP on the Funding of the Department of Paediatrics

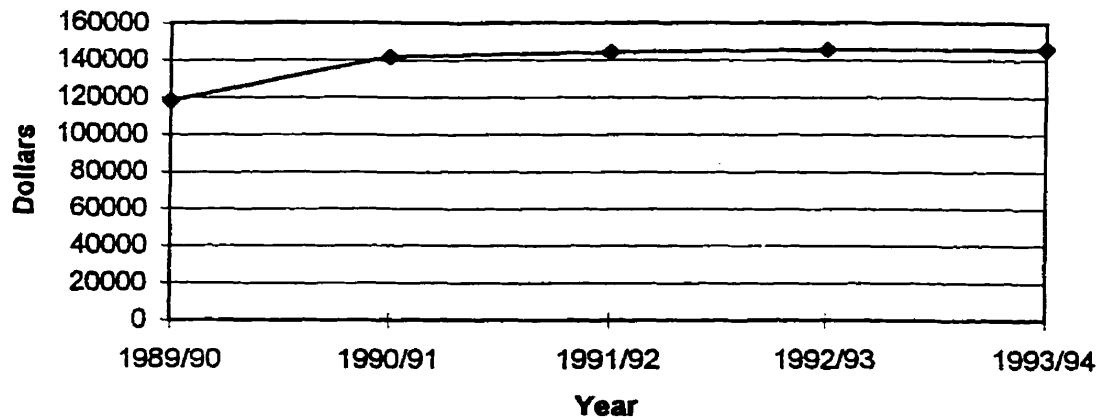
Figure 5.9 highlights the change in the funding sources of the HSC Department of Paediatrics from 1989/90 to 1994/95. As illustrated, the AFP increased the Ministry of Health contribution to the Department operations, while the contributions of the University of Toronto and the global

budget of HSC decreased. The other sources of funding with minor increases include the HSC Research Foundation and support from external agencies.



Although only 47% of respondents reported the resources available for compensation as fair or good, the amount of funds available to the Department increased substantially over the study period. Figure 5.10 highlights the available resources per FTE physician for the HSC Department of Paediatrics from 1989/90 to 1993/94. The average financial resources, as dollars per full time equivalent (FTE) physician, increased from \$118,120.12 in 1989/90 to \$145,896.09 in 1993/94, a 24 percent increase. Although the Departmental resources increased, 54% of the survey respondents indicated the distribution of the resources for compensation was fair or poor.

Figure 5.10 Average Departmental Financial Resources, Dollars per FTE Paediatrician, in HSC Department of Paediatrics, 1989/90 to 1994/95



The next figures, Figures 5.11 and 5.12 plot the financial resources available to the HSC Department of Paediatrics with the volume of clinical services for the period from 1989/90 to 1993/94.

Figure 5.11 OHIP/AFP Funding, Total Departmental Funding, & Clinical Service Volume for the HSC Department of Paediatrics, 1989/90 to 1994/95

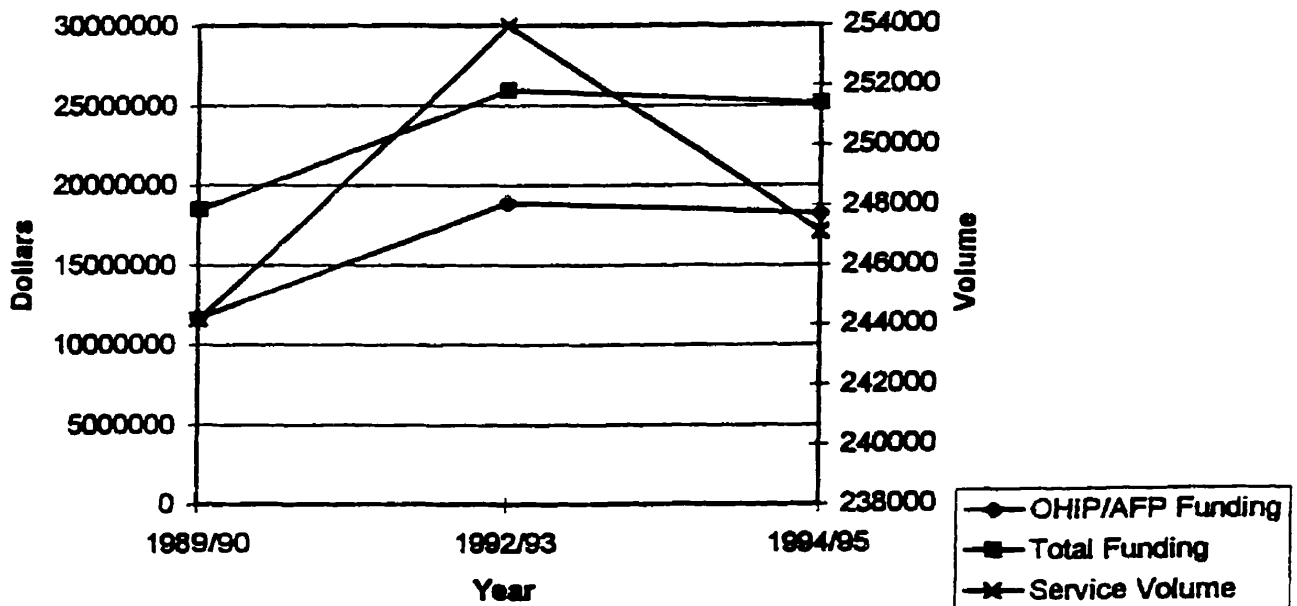


Figure 5.12 Comparison of Departmental Financial Resources per Physician with Clinical Service Volume, 1989/90 to 1993/94

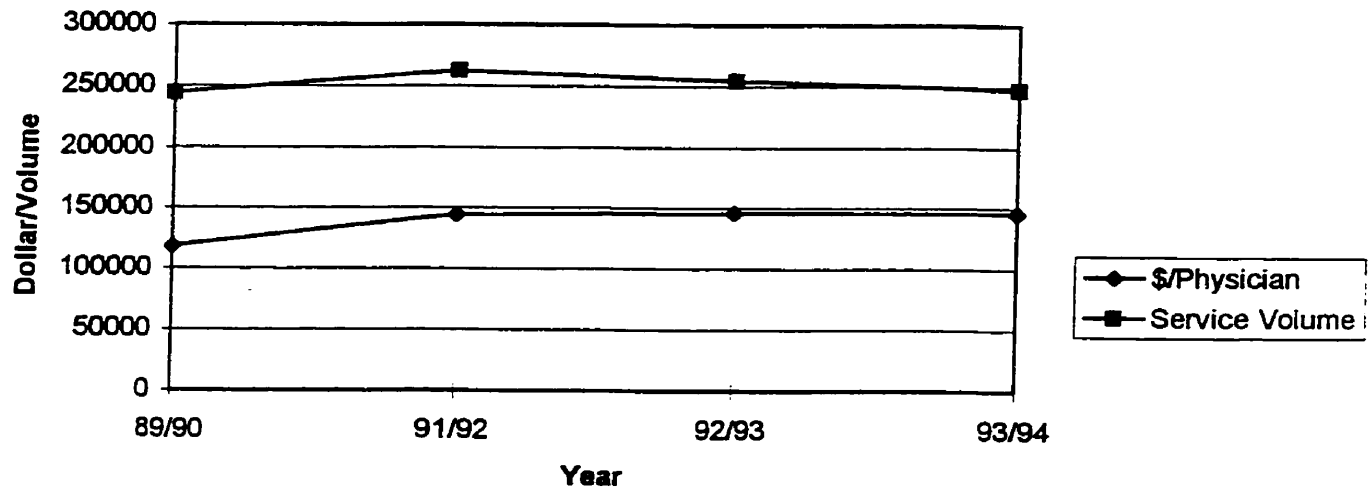


Figure 5.11 shows that in the year where a substantial increase in financial resources was achieved through the establishment of the AFP, the clinical utilization volume of the total Department also increased. However, the total Departmental service volume returned to the pre-AFP levels and financial allocations to the Department of Paediatrics levelled off in the following years.

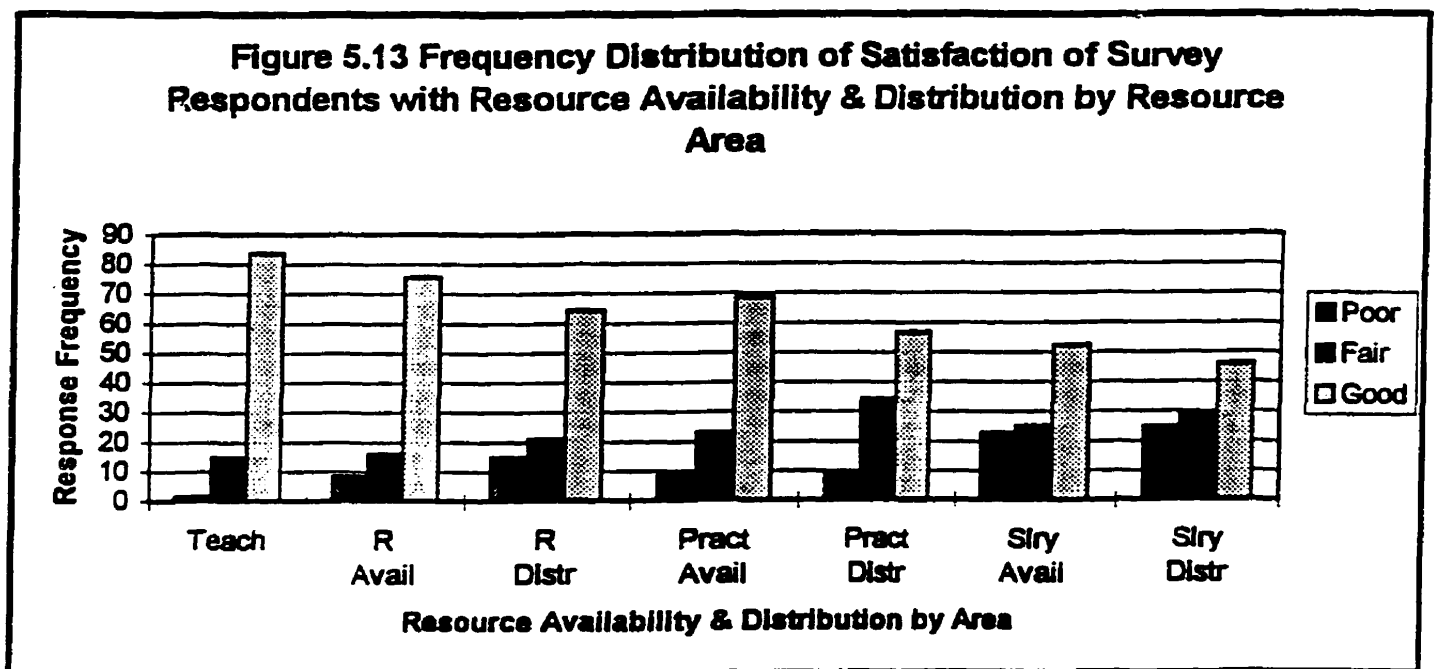
Figure 5.12 illustrates a similar pattern between the resources per physician and the clinical utilization. Both the available financial resources per physician and the clinical utilization increased immediately following the implementation of the AFP; the resource levels and service volumes decreased in the following years.

The survey asked respondents to comment on the availability of resources used for research, clinical practice, and salary and on the distribution of these resources among the Department members, using self-pairing of each respondent for the questions on availability and distribution. Paired sample t-tests were completed and the survey respondents were significantly less positive about the distribution of the resources. The following table presents the t-test analysis results.

Table 5.13 Paired T-Test Analysis of Availability and Distribution of Resources

Variables	Number of Pairs	Means	t-value	df	Significance
Availability of Research Resources Distribution of Research Resources	115	3.2565 2.8000	5.50	114	.000
Availability of Practice Resources Distribution of Practice Resources	119	2.9118 2.7059	3.04	118	.003
Availability of Salary Resources Distribution of Salary Resources	117	2.5128 2.3632	1.98	116	.050

As illustrated in Figure 5.13, in all cases the survey respondents were less satisfied with the distribution of the resources than with the overall availability of those resources.



CHAPTER 6 DISCUSSION AND CONCLUSIONS

6.1 Test of the Hypotheses

6.1.1 Clinical Utilization

Hypotheses one and two were not supported.

H1: The AFP will be associated with decreased clinical utilization by the participating paediatricians.

The clinical utilization of the paediatrician members of the Department of Paediatrics, measured as volume of procedures, was not shown to be statistically significantly different from the clinical utilization of Ontario paediatricians during the period of the study, from 1989/90 to 1994/95.

Based on early analysis of the HSC utilization data, Coyte (1995) had suggested that the members of the Department of Paediatrics of HSC off-loaded some of their workload when not required to generate FFS income. This was not found in this study. When the analysis was completed using the perspective of the HSC Department of Paediatrics providing a “needed” volume of services to the Toronto community (that is, analysis of the total volume of services provided by all HSC paediatricians), the results did not show a decrease in clinical utilization with the establishment of the AFP. The data illustrated a large increase in clinical volume in 1990/91 and 1991/92, the years immediately following the AFP, with a decrease back to the levels of clinical utilization prior to the establishment of the AFP in the time period from 1991/92 to 1994/95. The clinical service volume in 1994/95 was the same magnitude as the clinical volume prior to the introduction of the AFP.

Analysis was also completed of the average per physician clinical service volumes for all HSC paediatricians. Although the per physician volumes of the HSC paediatricians decreased by 1.4% (from 1080.5 procedures in 1989/90 to 1064.9 procedures in 1994/95) the analysis of variance did not find this decrease to be statistically significantly different from the per physician utilization of the Ontario paediatricians during the study time frame.

Separate analysis of the group of paediatricians who practiced at HSC both prior to and after the implementation of the AFP revealed that this group experienced a 17.7% decrease in clinical utilization from 1991/92 to 1994/95 (230,743 procedures in 1989/90 to 189,970 procedures in 1994/95). However, the average per physician volume for this group of physicians (1,120.1 in 1989/90 to 1,144.4 in 1994/95) increased by 2.2%. In addition, the per physician procedure volume for this group was found to be significantly greater than the per physician procedure volume of the Ontario paediatricians throughout the course of the study. This suggests that the overall decrease in clinical utilization for this group was not related to the establishment of the AFP, but was more likely the result of physicians with longer tenure reducing their practice as newer physicians joined the Department to pick up components of the clinical workload.

A 1994 random survey of Ontario physicians conducted by the Ontario Medical Association found that Ontario physicians generally believed that patients used the services of Ontario physicians more than needed and that lower physician utilization was appropriate (Kralj 1995). The respondents to the 1994 Canadian Medical Association (CMA) Physician Resource Questionnaire indicated that an aging population, government health insurance programs that

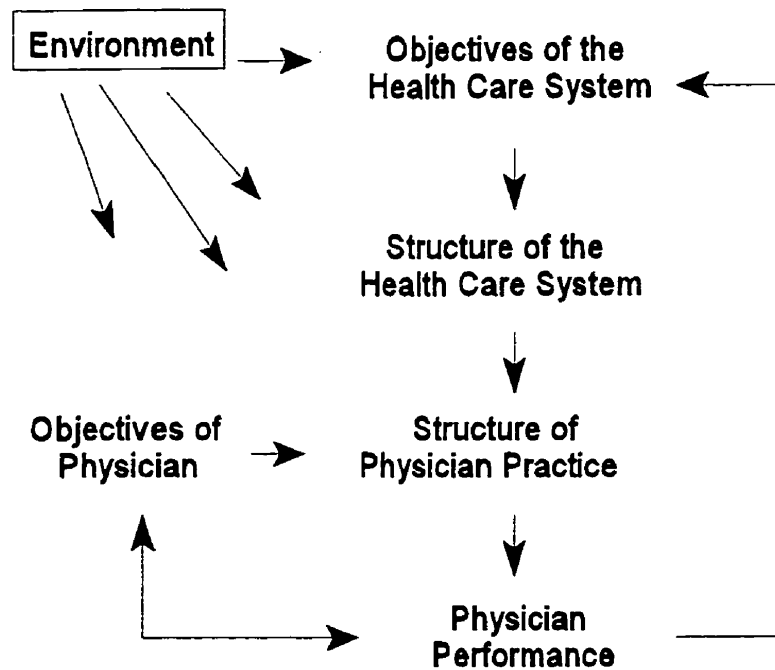
provided access to free medical services, and the fact that patients now seek medical attention for more minor health problems were the major factors that contributed to increasing utilization of physician services in Canada (Kralj 1995). The results of both the OMA and CMA surveys suggest that the FFS physicians in Ontario have higher clinical utilization than required to meet population needs. While a number of studies have shown that changing physician payment from FFS to salary or capitation methods leads to a reduction in clinical utilization (Hickson et al, 1987, Hemenway et al, 1990, Tussing & Wojtowycz, 1994, Hillman, Pauly & Kerstein, 1989), in this study the introduction of the AFP did not appear to have an effect in decreasing the clinical utilization of this group of paediatricians. In fact, in the years immediately following the establishment of the AFP, the clinical utilization increased.

As indicated earlier, the physician participants of this study had always been compensated by salary through the Department practice plan. The change occurred in the transfer of funding from the Ministry of Health to the practice plan, where FFS billing was replaced by a global budget. The fact that the AFP did not change the structure of physician practice at the level of the individual, suggests the participating paediatricians may not have experienced any change in incentives influencing the volume of their clinical utilization. In other words, although the structure changed at the level of the health care system, this was not translated into a change in structure at the level of physician practice. As a result, the participating physicians may not have experienced any change in their direct practice incentives.

In relation to the Analytical Framework described in Chapter 2, and presented below, although there was a change in the *Structure of the Health Care System*, because this was not translated into a change in the *Structure of Physician Practice* there was no observable impact on *Physician Performance*.

Figure 6.1 Review of the Analytical Framework

Adapted from Hornbrook & Berki (1985)



H2: The AFP will be associated with a change in the type of services the paediatricians provided to their patients and families, with more counselling and consulting services and less procedurally based services.

The change in the type of services rendered by the HSC paediatricians during this period was an increase in diagnostic and therapeutic procedures, with concomitant decreases in assessment, hospital care and counselling procedures. These utilization changes were opposite to the changes proposed in hypothesis two. Prior to the AFP there had been a clear incentive for physicians to complete procedures that would result in higher revenue for the Department to maintain Department operations. The OHIP fee schedule generally compensates procedurally-based services at a higher level than consulting and counseling-type services, perhaps leading to greater utilization of diagnostic and treatment procedures. Previous studies have found that diagnostic and surgical services tend to be more responsive to changes in fees than consultations or visits (Mitchell et al. 1989, Hurley et al. 1990). However, after the establishment of the AFP there were no financial incentives for the paediatricians to emphasize particular service types. Yet the diagnostic and therapeutic services increased substantially over this time period, while the assessment and counseling services decreased.

The possible reasons for the observed switch include: the changing role of the Hospital for Sick Children, changing needs of the population, patient/family expectations, general changes in the practice of medicine in Ontario, and financial incentives for The Hospital for Sick Children. Each is discussed below.

Changing Role of The Hospital for Sick Children

During the course of the study, the Hospital for Sick Children began the implementation of a new strategic vision that supported general paediatric care in regional paediatric centres outside the Toronto city core, with HSC maintaining its role as a specialized teaching, research and tertiary/quaternary acute care hospital. All providers of paediatric services would be connected through a paediatric network. This change in role may lead to increased assessment and counseling procedures taking place in the regional centres, with HSC playing a greater role in complex diagnosis and treatment. Although the new Hospital role had been communicated, coordinated planning with the regional paediatric centres was just being initiated. There was insufficient time for a substantial shift in role to have taken place.

If the HSC paediatricians functioned primarily as tertiary or quaternary contacts to other paediatricians in the community, the focus of their work might have changed from intermediate and minor assessments to diagnostic and treatment procedures, resulting in the changes in procedures observed in this study. However, the diagnostic and therapeutic service with reported decreases in service volume included services such as dialysis and hyper-alimentation, whereas those diagnostic and therapeutic services which increased among the HSC paediatricians and decreased among the Ontario paediatricians were generally EEG, venipuncture, respiratory testing, stress testing and injections. See Appendix 9.6 for a list of the procedures with increased or decreased utilization over the study time frame. The procedures with increased volume within the diagnostic and therapeutic service category appeared to be procedures that could be completed at other paediatric centres, not requiring the specialized expertise of The Hospital for

Sick Children. Many of these are also procedures for which the indications are not well-defined, and Wright (1998) suggested it was not unreasonable for physicians to order tests where the indications are loosely defined more often than tests where the indications are clearly defined. It appears, therefore, that the changing role of HSC was not a factor in the change in service utilization pattern.

Changing Population Needs

Other than the system-wide changes associated with the paediatric network discussed above, there were no indications that general population needs for paediatric services changed during the course of the study. The study period was characterized by ongoing shifts from inpatient to outpatient/ambulatory care. However, other than decreasing the in-hospital services provided, this would not account for reductions in assessments and counseling and increases in diagnostic and therapeutic services. Lending further support to the hypothesis that the utilization shifts were not in response to changing patient needs, a 1996 study by Hurley et al. suggested that market area characteristics had less influence on utilization changes than physician characteristics.

Patient/Family Expectations

As previously discussed, the diagnostic and therapeutic services with reported decreases in service volume included the more complex services, such as dialysis and hyper-alimentation, whereas those diagnostic and therapeutic services which registered increases among the HSC paediatricians and decreases among the Ontario paediatricians were generally for EEG, venipuncture, respiratory testing, stress testing and injections. These are procedure types which might be

expected by patients or their parents. Children and their parents have limited expertise in determining the indications for dialysis, but may expect a blood test in association with a visit to a specialist. This suggests that patient and family expectations may have contributed to the reported changes in procedure type.

Changing Practice of Medicine in Ontario

The literature related to the practice of paediatrics suggested that the practice was changing and that paediatricians would be expected to provide more community care, such as health supervision and preventive health care (American Academy of Paediatrics 1991). This change would likely require a greater focus on consultation, assessment and counseling procedures. However, the HSC paediatricians increased diagnostic and therapeutic procedures, while decreasing counseling and assessment procedures during the time frame of the study. These results are consistent with the findings of a previous study reviewing the utilization of other medical specialists. Hurley et al. (1996) found a strong shift in procedures from assessment visits and consults to diagnostic and therapeutic and surgical procedures for Ontario dermatologists, neurologists, and ophthalmologists from 1983 to 1990. In this study the Ontario paediatricians demonstrated a much higher proportion of diagnostic and therapeutic procedures than the HSC paediatricians, which increased minimally between 1989/90 and 1994/95. It is therefore likely that the shift observed among the HSC paediatricians was a reflection of specialist practice patterns throughout the province.

Financial Incentives for the Hospital

Although the paediatricians no longer had financial incentives to complete certain services or procedures, completion of some procedures would result in a technical fee component to cover the operating costs of diagnostic services. This means there was still an incentive for the physicians to complete certain diagnostic procedures on site at HSC to enable this technical fee component to be realized by the Hospital.

In summary, the volume of clinical utilization did not change over the study period. The pattern of clinical utilization changed but in the opposite direction to that hypothesized, with increases in diagnostic and therapeutic services. This shift in the pattern of utilization is likely the result of financial incentives for HSC to receive the technical portion of diagnostic fees, patient and family expectations, and overall changes in specialist practice throughout the province.

6.1.2 Teaching and Research Activity

Hypothesis three was supported.

H3: The AFP will be associated with increased research activity among the members of the Department of Paediatrics

Research utilization is an area where the Department members would have the ability to control the amount of time and effort invested in research activities. Proponents of the AFP suggested it could result in a better balance among the teaching, research, and clinical activities (Haslam & Walker, 1993). Generally, the research indicators demonstrated a pattern of increased utilization. It is suggested that the time frame of this study may not have been long enough to fully capture all

of the changes in research, with an underestimate of the increase in the research activities. In March 1996, the Queen's University Health Policy Unit (QHP) sponsored a 2-day workshop on the evaluation of alternate funding/payment plans. The report summarizing this workshop (QHP, 1996) suggested it may take at least five years before changes in education and research brought about by an AFP can be observed. In this study, the research activity increased in the years following implementation of the AFP.

Hypothesis four was supported

H4: The AFP will be associated with increased teaching activity among the members of the Department of Paediatrics

The members of the HSC Department of Paediatrics demonstrated an important increase in their teaching activity. While maintaining undergraduate levels, there was a substantial increase in post-graduate teaching. The core residents, where entry is controlled externally, remained at the same levels while the clinical fellows increased by 166% from 1989/90 to 1994/95. In the past, the fees derived from patient care heavily subsidized education and research within the academic setting, which put teaching and research at risk (Anderson et al., 1994). The AFP enabled the Department members to concentrate on teaching and research without having to focus on earning sufficient FFS income (Haslam & Walker, 1993).

In addition to the numbers of students increasing within the Department, the quality of the teaching experience improved following the implementation of the AFP. For example, the number of applicants to the core residency program at HSC rose by 58 percent from 1991 to 1995. Within

the undergraduate medical education program the teaching quality was reflected in improvement in the mean scores in Paediatrics for the University of Toronto in the Medical Council of Canada Licensing Examination results. From 1986 to 1990 the mean scores were below 500, but increased to 505 in 1991, 528 in 1992 and 530 in 1993. In summary, both the quantity and reported quality of the teaching activity increased during the study time frame.

6.1.3 Physician Satisfaction

Hypothesis five was not supported.

H5: Generally, the paediatrician group will express greater satisfaction with the AFP than with the previously existing FFS practice plan arrangements.

Hypothesis five was not supported. The survey respondents who were members of the Department of Paediatrics prior to the implementation of the AFP were significantly less likely to indicate that the AFP had a positive impact on their ability to complete their work when compared with the survey respondents who joined the Department following the implementation of the AFP.

Previous studies have shown that physicians tend to be least satisfied with the material and psychological rewards of medical practice (Kravitz, Linn & Shapiro 1990). Lower satisfaction with material rewards was found in this study. Although 86% of the survey respondents indicated that HSC was a good, very good or excellent place to practice medicine and 72% of the survey respondents indicated the establishment of the AFP was a positive factor for the Department, a

large proportion (25 to 59% of respondents) indicated both the amount of resources and the distribution of those resources were poor or fair. The respondents were significantly less positive with respect to the actual distribution of the resources for research, clinical practice and salary as compared with their responses in relation to the availability of the resources. The literature stresses that both distributive and procedural justice exist within organizations. Distributive justice addresses concerns about the fairness of the distribution of resources, while procedural justice is concerned with how such decisions are made. Dailey and Kirk (1992) found that distributive justice was related to job satisfaction, while procedural justice was related more closely to the intent to leave the organization. This was supported by McFarlin and Sweeney (1992) who found that procedural justice was related to organizational commitment. Brent (1992) stressed the importance of all department members perceiving that they have equitable and fair access to departmental resources. The survey results would suggest that many of the respondents did not have this confidence in the resources or resource distribution within the Department.

In this study, the older physicians tended to be least positive about the impact of the AFP on their ability to complete their work. This finding deviates from previous studies which showed a consistent relationship among physicians between increased age and greater job satisfaction (Kravitz, Linn & Shapiro, 1990). Because physicians with longer tenure and older age in other studies tended to express greater job satisfaction, findings in this study which would suggest satisfaction with the AFP among this group might be interpreted as general increasing job satisfaction with increasing age/tenure. However this study found that the older physicians with longer tenure in the Department were less positive about the impact AFP, suggesting the AFP did

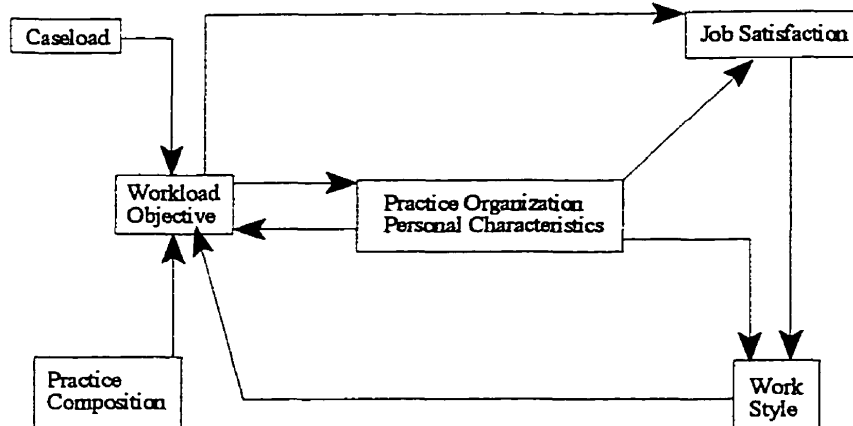
not have a positive impact on physician satisfaction.

Although in other studies physicians have expressed dissatisfaction with their existing participation in making administrative and organizational decisions (Kravitz, Linn & Shapiro 1990), this was not generally evident in this study. Seventy-eight percent of respondents indicated that the extent to which the hospital administrators were open to physician's suggestions and solicited their ideas was fair to good, and 77% percent felt that HSC was generally free from operational and bureaucratic difficulties.

After completing a comprehensive literature review on the job satisfaction of physicians Groenwegen and Hutten (1991) developed a model of physician job satisfaction which summarized the results of the studies in this area. This model is illustrated in Figure 6.2

Figure 6.2 Factors Impacting Physician Job Satisfaction

Groenwegen & Hutten (1991)



Using Figure 6.2 one can see that workload objective, practice organization and personal characteristics have been shown to influence job satisfaction. An alternate funding plan could change the workload objective, by creating incentives for the physicians to either increase or decrease their workload. However, as shown in the earlier analysis, the AFP did not change the workload objective of the participating physicians at HSC. An alternate payment plan could change the practice organization, but the HSC plan was a global departmental budget, which did not have any impact on the practice organization or the personal characteristics of the participating paediatricians. Therefore it is not unexpected to find that the AFP did not have a positive impact on the job satisfaction of the participating physicians.

6.2 Implications for Policy Makers

In March 1996 the Queen's University Health Policy Unit sponsored a 2-day workshop on "Evaluating Alternative Funding Plans in Academic Health Centres". The report summarizing the workshop proceedings suggested the following reasons for completing an evaluation of an AFP: (1) to demonstrate whether the objectives of the AFP had been achieved, (2) to provide accountability to stakeholders, and (3) to determine the impact of the AFP on the mission(s) of the participating organizations (QHP 1996). The implications of this study for policy makers will be reviewed with respect to each of these reasons for conducting an evaluation of an AFP.

6.2.1 To Demonstrate Whether the Objectives of the AFP Have Been Achieved.

Objectives of the Health Care System

The analytical model underlying this analysis (Figure 6.1, page 84) suggests that changes in the objectives and structures of the health care system will impact on the structure of physician practice and ultimately, physician performance. As discussed earlier (Objectives of the Health Care System, page 13), the overall objective of the health care system is to provide cost-effective and affordable publicly funded health care services, with all residents having the ability to choose and participate in a comprehensive range of necessary services. The financial constraints of decreasing transfers from the federal government and declining provincial revenues, (environmental factors with an impact on the health care system), increased the emphasis on cost reduction in this objective. This study would suggest that the system objectives may not have been achieved through the establishment of the AFP. The initial amount of funding provided by the Ministry of Health through the AFP was greater than the FFS billings of the Department. Even

though the AFP agreement enabled the global funding levels to be tied to the economy, which eventually led to a decrease in the budget from the level funded in 1990/91, the amount remained greater than the FFS OHIP billings for the same level of clinical service, as illustrated in Figure 5.11 (page 78). The same clinical volume was delivered for a greater amount of system resources.

Preservation of the system requires ongoing teaching and research. The objectives of the health care system in relation to teaching and research are important, but often unstated. The AFP funding model appeared to be successful in increasing the teaching and research activities. For an additional allocation of financial resources (with decreases in funding allocations from the Hospital for Sick Children global budget and the University of Toronto) the system was rewarded with the same clinical output and an increase in teaching and research activity.

Objectives of the Ontario Ministry of Health

The objectives of the Ontario Ministry of Health in entering the AFP Agreement with HSC were not documented. A reasonable, but unstated goal of the Ontario Ministry of Health may have been to achieve greater predictability and control of health care spending. This objective was achieved as the establishment of the AFP enabled the government to ensure control over the amount of funding allocated to paediatric services at The Hospital for Sick Children. This study showed that the AFP participants maintained service levels at the volume achieved prior to the AFP. However, the amount of funding was greater than that provided through the FFS OHIP billings.

While control over the operating funds was obtained, a stated funding principle of The Ministry of Health is to not fund health care research through funds meant to support the operations of health care institutions. In this Agreement, the Ministry set a precedent for enabling operating funds to support a research infrastructure.

Objectives of the HSC Department of Paediatrics

The primary financial objective of the Department of Paediatrics was to obtain sufficient FFS revenue to support the clinical, teaching and research activities. However, concerns about the effect of the provincial claw backs and income caps on the operating revenue of the Department led the leaders to trade some of the independence of operations of the Department for greater predictability in resource availability. This action is consistent with the propositions of resource dependency theory, whereby organizations are willing to bear the costs of restricted discretion in exchange for the benefits of predictable and certain exchange (Pfeffer & Salancik 1978). It would appear that the objective of the Department of Paediatrics to obtain a stable funding base, enabling the participating physicians to allocate time to teaching and research, was also achieved.

Objectives of the Members of the HSC Department of Paediatrics

Prior to the implementation of the AFP the physicians had a strong objective to maximize revenue. However in an academic health setting, one can presume that the member physicians would also have objectives related to quality clinical service, teaching and research as well as target income objectives. The results of the satisfaction survey suggest that the AFP was not overly successful in enhancing these objectives of the Department members.

In summary, it appears that the AFP enabled achievement of the objectives of the Ontario Ministry of Health and the Department of Paediatrics, but was less successful in supporting the objectives of the Canadian health care system or the individual physicians.

6.2.2 To Provide Accountability to Stakeholders

This study was not designed to identify the appropriate level of clinical utilization of this Department to meet the needs of the community. While the clinical utilization of the Department did not decrease in response to the AFP, as hypothesized, the levels of service provided may not be sufficient to meet the needs of the population. This is likely the largest difficulty with the implementation of alternate funding mechanisms. Without a priori defined service expectations it is difficult to ensure the accountability of the practitioners.

As discussed in Chapter 1, the Agreement between the Ministry of Health and HSC did not contain explicitly defined service expectations. The Agreement did not set out clear service expectations. This does not enable government funders to effectively monitor whether the Department of Paediatrics is meeting the needs of paediatric patients and their families. In a review of studies evaluating the impact of HSOs in Ontario, Abelson and Birch (1993) suggested that “HSOs have not performed in the manner that was originally conceived, largely because of the absence of explicit performance objectives.....” (p. 28). This study exposes a similar concern about the lack of performance expectations in the AFP of the Department of Paediatrics.

There are a wealth of studies which show that feedback is essential for learning, motivation and performance improvement (Ilgen, Fisher & Taylor, 1979, Ashford & Cummings, 1983, Ashford & Cummings, 1984). “Feedback is that information that denotes how well individuals are meeting various goals” (Ashford & Cummings, 1984, p.372). The change from FFS reimbursement eliminated an existing form of feedback. Physicians previously received financial information directly tied to their service provision. Clearly, patient outcomes form a very important feedback mechanism, but Greller and Herold (1975) stressed that performance improvement requires both appraisal feedback (e.g, that which informs whether the individual is functioning successfully, such as patient outcome information), and referent feedback. Referent feedback identifies what is required for the individual to function successfully within the position. Removal of the FFS OHIP billings eliminated a source of referent feedback. It is possible that the resource allocation to the Department of Paediatrics through the global budget became a replacement source of referent feedback to the physician group, with the paediatricans modifying their clinical utilization in association with the level of resources allocated to the Department. This explanation is consistent with an approach to understanding physician response to changing reimbursement proposed by Giacomini et al (1996) which would argue that a change in physician reimbursement represents a communication mechanism, whereby physicians respond to their perceptions of this communication, and modify their behaviour accordingly. Individuals by their very nature, look for feedback on their performance (Ashford & Cummings, 1984, Ashford & Tsui, 1991) and the reimbursement message is a communication function, with its interpretation related to the need of physicians for sources of referent feedback information. Reinhardt (1987) described the health care system in terms of an exchange relationship between providers and patients. The providers

transfer health care resources to patients and financial resources are transferred from society to the providers of health care. Reinhardt argues that the providers typically see this relationship as a very tight, direct exchange. Therefore, in this exchange a decrease in the flow of financial resources is interpreted by providers as a move to limit the flow of health care resources. Consistent with the model proposed by Reinhardt (1987), the pattern of increased service volume in the year immediately following the establishment of the AFP, with the return to pre-AFP volumes in subsequent years could be interpreted as a physician response to their AFP perceptions. As the funding increased, the physicians may have interpreted this as a link to increased exchange of health care. As the funding decreased again, this may have been interpreted as intent to decrease health care.

The important implication for policy makers is that future AFP agreements should clearly articulate the service expectations and the consequences if those service targets are not met. This will provide clarity around the issue of patient access, provide essential feedback information for the clinicians, and facilitate accountability to the stakeholders.

The members of the Department of Paediatrics are another group of stakeholders with an interest in the AFP. The Executive Committee of the Department carried responsibility for the distribution of the Department resources. The physician satisfaction survey suggested that procedural justice may be an issue for the responding physicians. Previous research has shown that distributive justice is related to general satisfaction, while procedural justice is more closely related to organizational commitment and intent to leave the organization (Dailey & Kirk, 1992, McFarlin &

Sweeney, 1992). The general satisfaction scores were relatively high, which is generally consistent with previous studies. For example, Burns, Anderson and Shortell (1990) found that salaried hospital-based physicians reported less conflict over autonomy than FFS physicians. However, attention needs to be paid to the issues related to procedural justice. The survey was not designed to measure organizational commitment. The low scoring on the perceptions of procedural justice within the Department may have a negative impact on long term commitment to the Hospital for Sick Children by the members of the Department of Paediatrics. In fact, the Department has since implemented human resources processes to address this issue.

6.2.3 To Determine The Impact Of The AFP On The Mission(s) Of The Participating Organizations

Consistent with the analytical framework (Figure 6.1, page 84), environmental constraints stimulated a change in the objectives of the health care system which led to a different payment structure for a portion of Ontario paediatricians. However, while there was a change in the structure of the health care system, this did not translate into changes in the structure of physician practice. The dependent variables which measured some components of physician performance did not illustrate significant change in the performance of the participating paediatricians. The physician satisfaction measures suggested that the AFP did not have a positive impact on assisting the physicians meet their objectives. It appears that without a change in the structure of physician practice, the AFP exerted little impact on the performance objectives.

The AFP as structured, did not focus the physicians on the mission and strategies of the Hospital for Sick Children or even the mission of the Department of Paediatrics. The mission of the Department requires “excellence in the health care of children” with health care defined in the broadest sense to include education/promotion, prevention, advocacy, health maintenance and treatment. Pagano (1993) identified the need for a physician compensation model to address the personal incentives of the physicians, but also the mission and values of the organization. The practice of paediatrics in the network model proposed by The Hospital for Sick Children and in meeting the mission of the Department would require a shift in services provided in the opposite direction from that shown by the AFP paediatricians. The future practice of paediatrics in this model would likely encompass greater attention to counseling and consultation and fewer simple diagnostic and therapeutic procedures by the HSC paediatricians. Robinson (1997) stressed the imperative to coordinate physician and hospital behaviour. Luft and Greenlick (1996) suggested that a global service budget which included hospital and physician services may be the best way to create incentives for cost-effective and affordable health care.

The global budget of the HSC AFP is not associated with a defined or rostered population and is only directed to the provision of physician services. Although Haslam and Walker (1993) suggested that when the pressures to bill for clinical service are removed attention can be redirected to a greater patient orientation, the AFP arrangement does not have sufficient safeguards to ensure physician accountability in achieving the mission of the Hospital for Sick Children within the allocated budget.

CHAPTER 7 STUDY LIMITATIONS

As noted previously, to generate a complete picture of the changes evoked by the implementation of the AFP it would be necessary to study the impact on utilization, costs, quality and access. This study was limited to study of the impact of the AFP on utilization. There are little reliable data on service quality and access for the time period of this study.

The study used the Ontario Health Insurance database. Generally, medical insurance databases have a reputation for being of relatively poor quality (Connell, Diehr & Hart 1987). There were discrepancies in the data reported by HSC and that of the OHIP database. For 12 of the OHIP procedures studied, the 1989/90 OHIP data base reported less volume than that actually billed by the HSC Department of Paediatrics. The results of this study should be interpreted with understanding of the limitations of the OHIP database.

There are two potential threats to the internal validity of this study. The first is a potential main effect of history. During the study period many external events, such as an economic downturn in the Province of Ontario, and the imposition of expenditure caps and social contract by the Ontario government could have had an impact on the measures in this study. However, the comparison with the Ontario paediatricians would suggest that the results observed were not solely related to history.

The second potential threat relates to instrumentation, where the variable measurements change over the course of the study. There is the potential that the OHIP shadow billing data has not

been collected by The Hospital for Sick Children in the same manner as the actual OHIP billing data prior to 1990. The Hospital continued to assist the physicians with the shadow billing process as it had with the OHIP billing process. This provides some assurance of consistency in the billing/shadow billing data of HSC.

It is recognized that the HSC and provincial paediatrician populations are not equivalent. The HSC paediatricians practice within an academic health science centre and carry expectations for teaching and research in addition to their clinical practice. The Ontario paediatrician population used in this analysis excludes the HSC paediatricians and therefore includes only a small number of academic paediatricians from centres such as Hamilton, Kingston, Ottawa and London. It would be expected that academic paediatricians would display lower clinical utilization in comparison with all paediatricians in Ontario. The HSC per paediatrician clinical utilization was lower than the Ontario per paediatrician clinical utilization throughout the study period.

The study design enabled repeated measures analysis of the HSC physicians, with each physician participating in the measurements in 1989/90, 1991/92, 1992/93, 1993/94, and 1994/95. This enabled all of the HSC paediatricians to participate as controls and cases within the study comparing the utilization of the different physician groups within the Department of Paediatrics. However to ensure confidentiality of the Ontario OHIP database, there were no physician identifiers provided. Individual physicians could not be identified within the data so there was no way to ensure the same stability in the paediatricians in Ontario over the study time period. This

necessitated the use of multifactorial analysis of variance and not repeated measures analysis of variance.

This study was based on OHIP billing and shadow-billing data for the HSC paediatricians. The OHIP fee schedule tracks volume and dollar values of designated medical services and the billing codes do not contain diagnostic or functional information on the patient and therefore do not reflect the levels of acuity or severity of the patients seen by the physicians. The time and effort expended in completing services that may vary among patients could not be captured in this study. The change in role in the HSC may have resulted in patients with higher acuity levels in both in and outpatient programs at the Hospital. Although the volume of medical services did not change appreciably, the casemix within the volume may have reflected a higher level of acuity and more physician time per service.

A standard questionnaire was used to capture physician satisfaction with the Hospital and with the AFP. Nelson, Rose and Batalden (1990) have suggested that because each physician has individual needs and expectations related to his/her practice hospital, it is difficult to design a general purpose questionnaire that accurately reflects the diversity of opinion.

Finally, this study did not explore how the paediatricians in the Department actually allocated their time among teaching, research and clinical service. Future study should explore in a time-motion type study how the paediatricians actually spend their time. Unfortunately, it will be difficult to obtain reliable baseline data prior to the establishment of the AFP. Other areas of physician time

utilization that should be studied include frequency of out-of-town teleconferencing and telephone consultations, the nature and extent of on-call activity, and the nature and extent of consultative activity within the Hospital.

7.1 Areas for Further Research

This study only reviewed the utilization impact of the AFP up to 1994/95. It will be important to determine if the reported clinical, teaching and research activities continue for a longer time period through additional study. Following the increased clinical utilization immediately after the establishment of the AFP, the clinical utilization decreased back to the levels of utilization achieved prior to the AFP. It will be important to determine whether the clinical utilization continues to decline beyond the 1989/90 levels or whether an equilibrium is reached. This can only be determined through further longitudinal study.

To gain a complete picture of the changes evoked by the establishment of the AFP it is necessary to study the impact on utilization, costs, quality, outcomes, and access. This study was limited to study of the impact of the AFP on physician utilization. Further study should look at the impact of an AFP on quality, outcomes and access. Measurement of these components is complex, with few valid and reliable indicators readily available. The importance of alternate funding and payment mechanisms should be their ability to influence the outcomes of the care process. Analysis of the volumes and types of services provides a necessary first step in evaluating the impact of an alternate funding or payment plan. However, it is the impact on the health of the population

receiving care through the plan physicians that is more important in determining the success of the AFP/APP.

At this point in time measures could not be obtained on the use of other hospital services, such as laboratory and diagnostic imaging by the AFP physicians. This would be an interesting area for future study. The observed changes in the type of service provided by the AFP physicians might have had an impact on the diagnostic and therapeutic services of The Hospital for Sick Children, possibly increasing costs in these areas. Further study is required to enable identification of all of the costs and benefits associated with the AFP. It would also be useful to study the impact of the AFP on the utilization of other health care services. There is potential for an AFP/APP to shift utilization from the acute care setting to rehabilitation, long term care or home care. Future study in these areas would be useful. A population or patient-based approach to this study would provide useful information on appropriate levels of clinical service.

The satisfaction component of this study focused solely on the satisfaction of the physicians with the AFP and the HSC in general. This is a very limited view of satisfaction. Further studies should be conducted which investigate the satisfaction of associated health care providers, both within and external to HSC, and the patients and their family members.

It was suggested by the Queen's Health Policy Unit that AFP "evaluation can be ongoing, and can serve to create a learning environment whereby the AHC can continually improve as it addresses the education, research and clinical service missions" (QHP, 1996 p.20). As the first study of an

AFP in Ontario, this research project should serve as a first step in a series of research initiatives designed to fully measure the total impact of the implementation of an alternate funding plan.

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INTERVIEWS

Aberman, A.; Dean of Medicine, University of Toronto, December 6, 1994

Doyle, J.; Division of Haematology/Oncology, February 14, 1995.

Clarke, J.; Division of Clinical Genetics, January 1998.

Federau, M.; Vice President of Corporate and Professional Services, November 15, 1994.

Freedom, R.M.; Division of Cardiology, February 14, 1995

Parkin, P. ; Division of General Paediatrics, February 14, 1995.

Walker, N.; Director, January 1995.

CHAPTER 9 APPENDICES

Appendix 9.1 Glossary Of Terms

Allied Health Professionals - Qualified professionals, other than physicians who provide health care directly to patients.

Capitation - Refers to a reimbursement rate per person unit of time that is independent of utilization of services (Payson, 1989). Fees may be set competitively, or through negotiations between the medical profession and payer (Nova Scotia, 1993).

Community Health Centre (CHC) - Community health centres provide a range of primary health care and social services to rostered patients in Ontario and in Saskatchewan (known as health cooperatives) and British Columbia (health and human resource centres). (MacKenzie et al., 1993). They are governed by a community board and remunerate physicians on a salary basis, negotiated between the physicians and the board.

Comprehensive Health Organization (CHO) - Is defined by the Ontario Ministry of Health as a nonprofit corporation which assumes responsibility for providing or purchasing the delivery of a full range of vertically integrated health care and related services to a defined population (Ontario Ministry of Health, 1992).

Centre Local de Services Communautaires (CLSC) - The local community centres have been in existence in Quebec since 1970, providing health and social services to a defined geographic area. The CLSCs receive per capita funding and pay the physicians a salary (MacKenzie et al., 1993), although the physicians receive payment directly from the Quebec Medical Plan, and not through the CLSC administration (Crichton, 1993). The initiation of the CLSCs was a move towards a physician group practice model, which would provide services on a 24-hour basis, 7 days a week (Renaud et al., 1980) and is the only provincially planned regional network of health and social services (Vayda, 1994).

General Practitioner (GP) - Individual who has entered general practice of medicine having successfully completed the four-year medical school training and one-year internship (Nova Scotia, 1993).

Health Care - Encompasses the full spectrum of health services from health promotion and disease prevention to the care and treatment of the sick.

Health Maintenance Organizations (HMOs) - Health maintenance organizations provide comprehensive coverage of hospital services, physician services, mental health care, drug benefits and other options in the United States (MacKenzie et al., 1993). In one typology of HMOs used by Interstudy (1986), four models of HMOs were identified: staff, group, network, and

independent practice association. Physicians employed in HMOs can be paid by salary, fee-for-service, or capitation, and may participate in profit-sharing or other efficiency-based incentive programs. Hillman (1987) found a variety of payment methods of the primary care physicians among HMOs, as illustrated in Figure A. The majority of the HMOs surveyed reported either FFS or capitation as the methods of payment of the primary care physician.

Figure 8.1 Method of Paying Primary Care Physicians,
According to Type of Plan and Ownership

Typology	Number Report	Method of Payment		
		Salary	Fee-For-Service	Capitation
Type				
Staff	29	23 (79%)	3 (10%)	3 (10%)
Group	31	12 (39%)	8 (26%)	11 (35%)
Network	59	1 (2%)	13 (22%)	45 (76%)
IPA	199	8 (4%)	105 (53%)	86 (43%)
Mixed	35	9 (26%)	9 (26%)	17 (49%)
Total	353	53 (15%)	138 (39%)	162 (46%)
Ownership				
For Profit	216	22 (10%)	91 (42%)	103 (48%)
Not For Profit	137	31 (23%)	48 (35%)	58 (42%)
Total	353	53 (15%)	139 (39%)	161 (46%)

Source: Hillman, 1987, p.1745.

Health Service Organization (HSO) - Health service organizations have existed in Ontario since 1973, providing primary care physician services, with capitation funding for rostered patients (MacKenzie et al. 1993). Previously some HSOs received additional funds for certain types of specialty care, but this has been discontinued (Vayda, 1994).

Independent Practice Associations (IPAs) - An IPA consists of physicians with ongoing practices who join in prepaid managed care networks, usually on an discounted fee (FFS) or profit-sharing basis. The IPA structure provides greater incentive to economize than the traditional FFS practice (Tussing & Wojtowycz, 1994).

Managed Care - Managed care is a system which is designed to provide the health care needs of a defined population for a fixed and predetermined sum. In the managed care system physician payments are capped. (Vayda, 1994).

Physician-Based Centres - This model includes the wide variety of physician practice arrangements. Funding arrangements for the participating physicians vary with each model (MacKenzie et al., 1993).

Peer Review - Practitioner performance is assessed by peers.

Practice Plan - Contractual arrangement among physicians for the receipt and distribution of earnings from professional medical service.

Primary Care Services - Include those services provided at first contact between the patient and the health professional, and include health promotion and maintenance of health (Nova Scotia, 1993).

Sessional Payments - Sessional payments are defined as flat fee payments for designated half or full days.

Teaching Hospital - A hospital formally affiliated with a university for the purpose of providing clinical medical education and research.

Utilization - The use, patterns of use, or rates of use of health care services (such as hospital care, physician visits, or prescription drugs) by a population (Nova Scotia, 1993).

Appendix 9.2

The Hospital for Sick Children Department of Paediatrics Funding Agreement

SCHEDULE B

RELATED FACILITIES

1. (With respect to consultative activities):

Bloorview Children's Hospital
25 Buchan Court
Willowdale, Ontario
M5J 4S9

Mount Sinai Hospital
600 University Avenue
Toronto, Ontario
M5G 1X5

Surrey Place Centre
2 Surrey Place
Toronto, Ontario
M5S 2C2

The Hugh MacMillan Centre
350 Runney Road
Toronto, Ontario
M4G 1R8

Women's College Hospital
76 Granville Street
Toronto, Ontario
M5S 1R2

2. (With respect to teaching and research activities,
and related administrative activities):

Any premises in which a Department Physician
carries on a private medical practice.

DATED:

HER MAJESTY THE QUEEN IN RIGHT OF THE
PROVINCE OF ONTARIO as represented by
the Minister of Health for the Province
of Ontario

- and -

The Hospital for Sick Children

- and -

The Governing Council of the University
of Toronto, Represented by its Faculty
of Medicine

- and -

The Chairman of the Department of
Paediatrics of the Hospital for Sick
Children

A G R E E M E N T

SCHEDULE B

RELATED FACILITIES

1. (With respect to consultative activities):

Elcorview Children's Hospital
25 Buchan Court
Willowdale, Ontario
M5J 4S9

Mount Sinai Hospital
600 University Avenue
Toronto, Ontario
M5G 1X5

Surrey Place Centre
2 Surrey Place
Toronto, Ontario
M5S 2C2

The Hugh MacMillan Centre
350 Runney Road
Toronto, Ontario
M4G 1R8

Women's College Hospital
76 Grenville Street
Toronto, Ontario
M5S 1B2

2. (With respect to teaching and research activities,
and related administrative activities):

Any premises in which a Department Physician
carries on a private medical practice.

SCHEDULE A
DEPARTMENT PHYSICIAN'S DECLARATION

TO: THE MINISTER OF HEALTH
FOR THE PROVINCE OF ONTARIO

I, _____, hereby declare to you as follows:

1. I am remunerated by the Chairman of the Department of Paediatrics of the Hospital for Sick Children ("the Department") for my professional activities as a member of the Department.
2. My remuneration from the Chairman includes remuneration, out of funds provided by you, for my rendering insured medical services to insured persons. I accept this remuneration in lieu of any payment that I might otherwise be entitled to claim for and receive from OHIP in respect of services rendered by me as a member of the Department.
3. I will not claim for or accept payment from OHIP, either directly or through a group, for any insured services that I render on and after April 1, 1990 as a member of the Department, until otherwise authorized by you.

Signature of Physician: _____

Date: _____

MINISTER OF HEALTH

per: Steven Kaplan

date: June 26/90

CHAIRMAN OF THE DEPARTMENT OF PAEDIATRICS OF THE HOSPITAL FOR SICK CHILDREN

per: Robert Kaplan

date: June 22, 1990.

THE GOVERNING COUNCIL OF THE UNIVERSITY OF TORONTO, REPRESENTED BY ITS FACULTY OF MEDICINE

per: J. H. [unclear] [unclear]

date: June 23/90

HOSPITAL FOR SICK CHILDREN

per: [unclear]

date: JUNE 22, 1990

ARTICLE 12: EXTENSION OF THIS AGREEMENT

12.1. Subject to paragraphs 8.1 (Termination) and 12.2 (Extension), this Agreement expires on March 31, 1991.

12.2. Subject to paragraph 8.1, if each party other than the Minister notifies all of the other parties in writing before March 31, 1991 that it wishes to extend this Agreement, this Agreement will be deemed to be extended for a further six months ending September 30, 1991 ("the extension period"), except that

12.2.1 The monthly payment by the Minister under paragraph 2.1 will, during the extension period, be increased by the percentage adopted by the Ontario government as its standard 1991/92 increase in the level of basic provincial support.

12.2.2 The amounts to be provided to the Chairman by the University and the Hospital during the extension period under paragraphs 5.1 and 5.2, respectively shall be not less than 48% and 50% respectively of the amounts set out in paragraphs 5.1 and 5.2.

12.2.3 All references in this Agreement to 1990/91 (other than in paragraph 5.4) will be interpreted as referring to the extension period.

ARTICLE 13: DEPARTMENT PHYSICIANS' DECLARATIONS

13.1. The Chairman will obtain and hold for the Minister a signed Declaration from each Department Physician,

13.1.1 In the case of a full-time or regular part-time physician who is a member of the Department at the time this Agreement is signed by the Chairman, not later than 30 days after the date of signing.

13.1.2 In the case of an occasional part-time physician, at the earliest reasonable opportunity.

13.1.3 In the case of a physician who becomes a Department Physician after the date on which this Agreement is signed by the Chairman, not later than 15 days after the Physician becomes a Department Physician.

8.2.3. The Department Physicians are collectively tending to perform fewer clinical Department services, in favour of more clinical services in their private practices or more teaching, research or administrative activities, than they otherwise would but for the Minister's funding.

ARTICLE 9: BENEFICIAL INTENT

9.1. It is the intent of this Agreement that it benefit all of the parties and the Department Physicians while enhancing patient care in Ontario, and accordingly each party will act in good faith and make all reasonable efforts to achieve those ends.

ARTICLE 10: PARTIES' REPRESENTATIVES

10.1. Any party may from time to time, by notice in writing to that effect to the other parties, designate one or more persons by name or by position to exercise any function or power of the designating party under this Agreement.

10.2. A person designated pursuant to paragraph 10.1 may, on behalf of the designating party, exercise all or any of the powers and carry out all or any of the functions set out in the notice. Anything done or said by a designee that is within the scope of the designee's authority as set out in the notice referred to in paragraph 10.1 shall be deemed to have been done or said by the designating party.

10.3. A communication, whether oral or in writing to a designee shall be deemed to be a communication to the designating party.

ARTICLE 11: DEPARTMENT PHYSICIANS ARE NOT EMPLOYEES OF THE
MINISTER

11.1. Nothing in this Agreement, including the Minister's funding, is intended to or shall be construed to confer any power on the Minister to direct or control the Chairman or the Department Physicians in any way in the performance of the Department services, or to create the relationship of employer/employee between the Chairman or any Department Physician and the Minister or the Crown.

- 6.1.1. To verify the information set out in the Department Reports delivered to the Minister under Article 4.
- 6.1.2. To verify the amounts provided in 1990/91 by the Hospital and the University under Article 5.
- 6.1.3. To verify the amounts received in 1990/91 by the Chairman from other sources for research.
- 6.2. Paragraph 6.1 remains in effect despite the termination or expiry of this Agreement.

ARTICLE 7: CONSULTATION AMONGST PARTIES

- 7.1. Any party having concerns about any matter arising out of this Agreement, including its effect on the incomes of the Department Physicians or on the quality or extent of health care, teaching or research carried out by the Department Physicians, may call all or any of the other parties to meet together, consider and work toward a resolution of those concerns.

ARTICLE 8: TERMINATION

- 8.1. Any party may terminate this Agreement as of the last day of any calendar month by giving at least 30 days' (or in the case of termination by the Minister, 60 days') prior notice in writing to that effect to each of the other parties.
- 8.2. The Minister may not terminate this Agreement under paragraph 8.1 unless and until the Minister has concluded that any of the circumstances set out in 8.2.1 to 8.2.3 exist, that their existence is prejudicial to the intent of this Agreement and that despite all reasonable efforts as provided for in Article 7 the Minister's concerns cannot be resolved satisfactorily:
- 8.2.1. A party has breached or has not performed an obligation under this Agreement.
- 8.2.2. A Department Physician has not submitted a declaration to the Chairman, or has breached his/her undertaking in the Declaration.

4.2.3. An estimate, in percentages, of how the total time spent by the Department Physicians on Department services was divided amongst clinical, teaching, research and administrative activities.

4.3. The Minister may withhold a monthly payment pending delivery of the report in that month.

ARTICLE 5: OTHER FUNDING

5.1. In 1990/91 the University will provide to the Chairman not less than [REDACTED] (which amount includes [REDACTED] received from the Ministry of Colleges and Universities, and University of Toronto T & R [REDACTED]).

5.2. In 1990/91 the Hospital will provide to the Chairman not less than [REDACTED] (which amounts does not include funds provided by the University to the Hospital).

5.3. The Chairman shall use the funds provided under paragraphs 5.1 and 5.2 to pay the 1990/91 incomes of the Department Physicians for performing Department services, and for 1990/91 expenses of the Department.

5.4. The Chairman anticipates receiving the following funding in 1990/91 for Department Services:

5.4.1. [REDACTED] from sources other than any of the other parties for research.

5.4.2. [REDACTED] under the "Emergency Physician" arrangement.

5.4.3. [REDACTED] under the "Clinical Assistant" arrangement.

5.4.4. [REDACTED] from "Clinical Education" funding provided from the Hospital.

ARTICLE 6: INSPECTION BY MINISTER

6.1. While this Agreement is in effect and for two years thereafter the Hospital, the University and the Chairman will, on reasonable notice, permit the Minister to have access to and inspect hospital charts, medical records, financial records and other documents and records relating to the Department and to the performance of Department services, for the following purposes:

- 2.3. The Minister's funding is based on an adjusted 1989/90 base amount of [REDACTED] plus 5.5% as the Ontario government's standard 1990/91 increase in the level of basic provincial support, less the funding amounts set out in paragraphs 5.1, 5.2 and 5.4.
- 2.4. The Minister's funding includes [REDACTED] for an additional 5 full-time equivalent Department Physicians as well as associated support staff in 1990/91.

ARTICLE 3: NO CLAIMS AGAINST OHIP

- 3.1. The Chairman warrants that no Department Physician will claim for or accept payment under the Ontario Health Insurance Plan, either directly or through a group, for any insured Department services rendered by the physician from April 1, 1990 until this Agreement expires or is terminated.
- 3.2. If a Department Physician accepts any such payment from the Ontario Health Insurance Plan, the Minister may deduct the amount of the payment from any money that is otherwise payable to the Chairman under this Agreement.

ARTICLE 4: DEPARTMENT REPORTS

- 4.1. Forthwith after this Agreement has been signed by all parties the Chairman will deliver to the Minister a list of all Department Physicians, setting out the College of Physicians and Surgeons registration number and CHIP registration number of each and indicating whether the physician is full-time, regular part-time or occasional part-time.
- 4.2. On or before the 15th day of each month, including the month next following the expiry or other termination of this Agreement, the Chairman will deliver to the Minister a report setting out the following information in respect of the preceding month:
- 4.2.1. The names, College of Physicians and Surgeons registration numbers and OHIP registration numbers of all physicians who became or who ceased to be Department Physicians.
- 4.2.2. The daily record of clinical services rendered to each Department patient including the OHIP number of the patient and the site of the services (i.e., the hospital or the specific related facility).

1. The parties have agreed on the funding arrangements set out below, as interim arrangements pending their agreement on long-term funding arrangements for the Department Physicians.

NOW THEREFORE THIS AGREEMENT WITNESSES that the parties do hereby agree amongst themselves as follows:

ARTICLE 1: DEFINITIONS

- 1.1. "Declaration" means a Declaration in the form of Schedule A.
- 1.2. "Department" means the Department of Paediatrics of the Faculty of Medicine, University of Toronto, at the Hospital for Sick Children.
- 1.3. "Department Physician" means a physician who is a member of the Department, other than a physician who primarily carries out any services at Mount Sinai Hospital Neonatal Unit or Woman's College Hospital Neonatal Unit.
- 1.4. "Department services" means clinical, teaching and research activities (including related administrative activities) carried out by Department Physicians, as members of the Department, in the premises of the Hospital, a related facility or the University.
- 1.5. "patient" includes an out-patient.
- 1.6. "related facility" means a facility listed in Schedule B.
- 1.7. "1990/91" means the period from April 1, 1990 to March 31, 1991.

ARTICLE 2: FUNDING BY MINISTER

- 2.1. The Minister will pay to the Chairman the sum of on or before the last day of each month, beginning April, 1990 and ending March, 1991 ("The Minister's funding"). Any such payment due and unpaid before all parties have signed this Agreement will be paid forthwith thereafter.
- 2.2. The Chairman will use the Minister's funding to pay the 1990/91 incomes of the Department Physicians for carrying out Department services, and for 1990/91 expenses of the Department.

THIS AGREEMENT, called "THE HOSPITAL FOR SICK CHILDREN
DEPARTMENT OF PAEDIATRICS FUNDING AGREEMENT, made as of the 1st day of April,
1990.

B E T W E E N :

HER MAJESTY THE QUEEN IN RIGHT
OF THE PROVINCE OF ONTARIO

as represented by the Minister of
Health for the Province of Ontario
(hereinafter called "the Minister")

- and -

THE HOSPITAL FOR SICK CHILDREN

(hereinafter called "the Hospital")

- and -

THE GOVERNING COUNCIL OF THE UNIVERSITY
OF TORONTO, REPRESENTED BY ITS FACULTY
OF MEDICINE

(hereinafter called "the University")

- and -

THE CHAIRMAN OF THE DEPARTMENT OF
PAEDIATRICS OF THE HOSPITAL FOR SICK
CHILDREN

(hereinafter called "the Chairman")

WHEREAS:

1. The Minister has authority to enter into arrangements for payment to physicians rendering insured services, on a basis other than fee for service; and
2. The Department Physicians (as defined below) collectively carry out a unique and special combination of clinical, teaching and research activities, for which special funding arrangements are appropriate; and

Appendix 9.3

Satisfaction Survey Questionnaire

**THE HOSPITAL FOR SICK CHILDREN DEPARTMENT OF PAEDIATRICS
PHYSICIAN SURVEY, April 1996**

Information for Participants

The questions in this survey ask for your views about The Hospital for Sick Children and the Alternative Funding Plan (AFP) of the Department of Paediatrics.

Your individual answers are strictly confidential and will be seen only by the University of Toronto researcher. Answers will be summarized for groups of people, but with no fewer than 10 people per group. The only results I will report to your organization will be those summaries. There will be no way to identify your answers or those of anyone else.

I have tried to design this questionnaire so that it will be easy to fill out and will not take too much of your time. However, if you do have any questions, please feel free to call:

Sandra Leggat
Department of Health Administration
(416) 978-0283
sandra.leggat@utoronto.ca

Each of the statements below is something a person might say about the Alternative Funding Plan (AFP) of the Department of Paediatrics. Please circle the number from 1 to 7 that best reflects what you think about each statement.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Moderately agree	Strongly agree

- | | | | | | | | | |
|----|--|---|---|---|---|---|---|---|
| 1. | The AFP changed the operations of the Department of Paediatrics. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | The implementation of the AFP was a positive move for the Department of Paediatrics. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | The AFP has made it easier for the Department of Paediatrics to achieve the goals in clinical care, teaching and research. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | The AFP has had a positive impact on my ability to complete my work. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | If I were considering joining this organization today, the AFP would be a positive factor in my decision. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | I am more positive about my involvement with this organization since the implementation of the AFP. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Each of the statements below is something a person might say about the place where he or she works/practices and some of the activities that go on there. Please circle the number from 1 to 7 that best reflects what you think about each statement.

1 Strongly disagree	2 Moderately disagree	3 Slightly disagree	4 Neither agree nor disagree	5 Slightly agree	6 Moderately agree	7 Strongly agree
------------------------	--------------------------	------------------------	---------------------------------	---------------------	-----------------------	---------------------

- | | | | | | | | | |
|-----|--|---|---|---|---|---|---|---|
| 7. | I talk up this organization to my friends as a great organization to work for. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | I am proud to tell others that I am part of this organization. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. | This organization really inspires the very best in me in the way of job performance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. | When people in this organization make changes in the way things are done, they always talk first with the people who will be affected. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. | I find that my values and the organization's values are very similar. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. | I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. | I am extremely glad that I chose this organization to work for over others I was considering at the time I joined. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. | I really care about the fate of this organization. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. | For me this is the best of all possible organizations for which to work. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

The following section asks about your opinions of The Hospital for Sick Children (HSC) as a place to practice. Please rate each area on the following five point scale.

1 Poor	2 Fair	3 Good	4 Very Good	5 Excellent
-----------	-----------	-----------	----------------	----------------

- | | | | | | | |
|-----|--|---|---|---|---|---|
| 16. | Interest in Physician's Ideas: Extent to which administrators are open to physicians' suggestions and solicit their ideas. | 1 | 2 | 3 | 4 | 5 |
|-----|--|---|---|---|---|---|

17.	Clinical Teaching: Facilities and resources for clinical teaching within the organization.	1	2	3	4	5
18.	Research Resources: Resources, including space, equipment, time, and staff support, made available to physicians by the organization for research.	1	2	3	4	5
19.	Research Resource Distribution: Fairness and appropriateness of distribution process for organization-supplied research resources.	1	2	3	4	5
20.	Practice Resources: Resources available to physicians for their individual clinical practice.	1	2	3	4	5
21.	Practice Resource Distribution: Fairness and appropriateness of distribution methods for resources for clinical practice.	1	2	3	4	5
22.	Salary: Resources available to individual physicians for their financial compensation.	1	2	3	4	5
23.	Distribution of Salary Resources: Fairness and appropriateness of distribution methods for resources for financial compensation.	1	2	3	4	5
24.	Support for Career: Hospital support for the career aspirations of individual physicians.	1	2	3	4	5
25.	Physician Involvement in Administration of the Department: The appropriateness and meaningfulness of physician involvement in administration of the Department of Paediatrics.	1	2	3	4	5
26.	Hospital As A Place To Practice: Overall, the quality of this hospital as a place to practice medicine.	1	2	3	4	5
27.	General Support for Medicine: Overall, the support and recognition given to physicians at HSC.	1	2	3	4	5
28.	Freedom From Operational Difficulties: Extent to which this hospital is a comfortable place to practice, free from operational and bureaucratic difficulties.	1	2	3	4	5

In this final section I would now appreciate some information about you. This information will be used to analyze group responses in your organization. Anything you tell me is completely confidential.

Please circle the number beside your answer to each question.

32. Could you please indicate your age category?

- | | |
|-------------------|-------------------|
| 1. Under 30 years | 4. 50 to 59 years |
| 2. 30 to 39 years | 5. 60 or over |
| 3. 40 to 49 years | |

33. What is your gender?

- | | |
|-----------|---------|
| 1. Female | 2. Male |
|-----------|---------|

34. Which is your division within the Department of Paediatrics?

- | | |
|--|--|
| 1. Adolescent Medicine | 11. Haematology/Oncology |
| 2. Cardiology | 12. Immunology/Allergy |
| 3. Chest Diseases | 13. Infectious Diseases |
| 4. Clinical Genetics | 14. Medical Education |
| 5. Clinical Pharmacology & Toxicology | 15. Neonatology: HSC & Mount Sinai |
| 6. Dermatology | 16. Nephrology |
| 7. Emergency Paediatrics | 17. Neurology |
| 8. Endocrinology | 18. Paediatric & Adolescent Gynecology |
| 9. Gastroenterology and Clinical Nutrition | 19. Rheumatology |
| 10. General Paediatrics | 20. Scan Program |

35. How long have you worked/practised in this organization?

- | | |
|---------------------|---------------------|
| 1. Less than 1 year | 4. 11 to 15 years |
| 2. 1 to 5 years | 5. 16 or more years |
| 3. 6 to 10 years | |

Please use this space for any comments you wish to make.

Thank you very much for taking the time to complete this questionnaire. Please place it in the envelope provided and return to me by HPI by May 17, 1996.

Dear:

As you are aware, the Department of Paediatrics entered into an Alternate Funding Plan (AFP) with the Ontario Ministry of Health in 1990. After participation in the plan for six years, I feel that it is important to evaluate the impact of this AFP on the Department of Paediatrics. We are particularly interested in how satisfied you are with the AFP and how it may have impacted on your clinical practice, teaching or research activities at the Hospital. This information will be helpful in future negotiations with the Ministry of Health and in improving our internal administration of the AFP.

A graduate student, Sandra Leggat, from the Department of Health Administration, Faculty of Medicine at the University of Toronto is organizing an evaluation of the impact of the AFP, with my assistance, for her doctoral dissertation. To obtain your opinions on the AFP, Sandra has developed the attached questionnaire. In order to obtain a complete picture, all members of the Department of Paediatrics are being asked to complete the questionnaire. Your response to this survey will be important information for the future structure of our payment plan(s).

Your participation in this project is voluntary. Please assist by completing the questionnaire and mailing it to Sandra **by April 30, 1996**. As she indicates in the questionnaire, you may be assured of complete confidentiality. An identification code has been printed on the enclosed return envelope. This code will be used by the researcher only to determine who has responded to the survey, in the event a second mailing is necessary. As soon as the completed questionnaires are received, the envelope will be filed separately from the completed questionnaire. This will ensure that there will be no way to identify individual questionnaires.

If you have any questions or concerns, please do not hesitate to call Sandra at (416) 978-0283.

Thank you for your participation.

Sincerely,

R.H.A. Haslam, M.D., F.R.C.P.(C)
Professor and Chairman
Department of Paediatrics

Appendix 9.4 Key To OHIP Procedure Codes

GENERAL PRACTICE

A003A GENERAL ASSESSMENT OFFICE
A005A CONSULTATION
A006A REPEAT CONSULTATION
A007A INTERMEDIATE ASSESSMENT OFFICE

DERMATOLOGY

A023A SPECIFIC ASSESSMENT
A024A PARTIAL ASSESSMENT
A025A CONSULTATION

INTERNAL MEDICINE

A135A CONSULTATION

NEUROLOGY

A185A CONSULTATION

GYNAECOLOGY

A203A SPECIFIC ASSESSMENT
A204A PARTIAL ASSESSMENT
A205A CONSULTATION

PAEDIATRICS

A261A MINOR ASSESSMENT
A263A GENERAL ASSESSMENT
A264A GENERAL REASSESSMENT
A265A CONSULTATION
A266A REPEAT CONSULTATION

GASTROENTEROLOGY

A413A GENERAL ASSESSMENT

A565A LIMITED CONSULTATION

CARDIOLOGY

A605A CONSULTATION

HAEMATOLOGY

A613A GENERAL ASSESSMENT
A614A GENERAL REASSESSMENT

A888A ASSESSMENT EMERG. DEPT. EQUIVALENT

C010A SUPPORTIVE CARE

C101A SPECIAL CARE I.C.U OR C.C.U

NEUROLOGY

C182A SUBSEQUENT VISITS UP TO 5 WEEKS

C185A CONSULTATION

PAEDIATRICS

C262A SUBSEQUENT VISITS UP TO 6 WEEKS
C263A GENERAL ASSESSMENT
C264A GENERAL REASSESSMENT
C265A CONSULTATION
C266A REPEAT CONSULTATION
C267A SUBSEQUENT VISITS FROM 7 TO 13 WK INCL
C268A CONCURRENT CARE
C269A SUBSEQUENT VISITS AFTER 13TH WEEK

GASTROENTEROLOGY

C412A SUBSEQUENT VISITS UP TO FIVE WEEKS
C413A GENERAL ASSESSMENT

CARDIOLOGY

C602A SUBSEQUENT VISITS
C605A CONSULTATION
C612A SUBSEQUENT VISITS UP TO FIVE WEEKS
C994A NIGHTS SAT. SUN HOLIDAYS FIRST PATIENT SEEN

E030A EMERG DEPT EQUIVALENT effective 1/4/94 use A888
E717A COLONOSCOPY IF BIOPSY WITH GASTRO PROC

G009A URINALYSIS, ROUTINE
G010A URINALYSIS, WITHOUT MICROSCOPY
G100A HEMOPHILIA
G138A EVOKED POTENTIALS DOUBLE FEE FOR 2 LIMBS
G196A PENCILLIN HYPERSENSITIVITY SKIN TEST
G197A SKIN TESTS PROFESS. COMPONENT MAXIMUM 8.00
G209A SKIN TESTS
G271A ANTICOAGULANT SUPERVISION
G279A INDIRECT TRANSFUSION
G281A CHEMOTHERAPY EACH ADDITIONAL INJECTION
G289A FICK DETERMINATION
G297A ANGIOGRAMS
G299A OXYMETRY
G313A PROFESSIONAL COMPONENT
G319A MAXIMAL STRESS E.C.G. PROFESSIONAL COMPONENT

G326A CHRONIC HAEMODIALYSIS
G332A PERITONEAL DIALYSIS CHRONIC
G333A HOME DIALYSIS WEEKLY RETAINER
G359A SPECIAL SINGLE AGENT CHEMOTHERAPY
G372A INJECTION INTRADERMAL INTRAMUSCULAR
G373A INTRADERMAL INTRAMUSCULAR FIRST INJECTION
G379A INTRAVENOUS CHILD OR ADULT
G381A CHEMOTHERAPY SINGLE INJECTION
G389A INFUSION OF GAMMA GLOBOULIN
G415A ELECTRENCEPHALOGRAPHY PROFESSIONAL
G420A EAR SYRINGING
G456A EMG
G480A VENIPUNCTURE INFANT
G482A VENIPUNCTURE CHILD
G489A VENIPUNCTURE ADOLSCENT OR ADULT

G510A MANAGEMENT HYPERALIMENTATION UP TO 12 WEEKS
G515A OPEN CIRCUIT INDIRECT CALORIMETRY (DETERM. OF RES.)
G561A ECHOCARDIOGRAPHY - 1 DIM. PROFESSIONAL COMP.
G571A ECHOCARDIOGRAPHY - 1 AND 2 DIM. PROF. COMP.
G600A NEONATAL INTENSIVE CARE 1ST DAY
G621A 2ND DAY ONWARDS PER DIEM
G650A LEVEL 1 PROFESSIONAL COMPONENT
G700A WHEN A PROCEDURE IS SOLE REASON FOR A VISIT

J304A FLOW VOLUME LOOP
J306A AIRWAYS RESISTANCE
J307A FUNCTIONAL RESIDUAL CAPACITY
J311A FUNCTIONAL RESIDUAL CAPACITY

K002A INTERVIEWS WITH RELATIVES 1 HALF HOUR
K007A PSYCHOTHERAPY INDIVIDUAL 1 HALF HOUR
K008A DIAGNOSTIC INTERVIEW WITH CHILD 1 HALF HOUR
K013A COUNSELLING PER 1 HALF HOUR
K015A COUNSELLING RELATIVES
K016A GENETIC ASSESSMENT (MAX. 2 HRS.)

L800A BLOOD FILM INTERPRETATION

P004A MINOR ASSESSMENT
R051A LASER SURGERY ON GRP 1-4 MALIGNANT LESION
R051M LASER SURGERY ON GRP 1-4 MALIGNANT LESION

Z117A CHEMICAL TREATMENT 1 LESION
Z439A RIGHT HEART PRESSURES ONLY
Z440A LEFT HEART RETROGRADE AORTIC
Z441A TRANSEPTAL
Z601A RENAL BIOPSY NEEDLE
Z804A LUMBER PUNCTURE
Z805A LUMBER PUNCTURE WITH INSTILLATION OF MEDICATION

Appendix 9.5 Categorization Of OHIP Procedure Codes

Major Consultation	Intermediate Assessment	Minor Assessment	Hospital Care	Diagnostic & Therapeutic	Counselling
A003A A005A A263A A265A A613A C263A C265A	A006A A007A A264A A266A A565A A614A C262A C264A C266A	A261A C267A C269A P004A	C010A C101A C268A C994A G600A G621A E030A	G009A G010A G100A G196A G197A G209A G271A G279A G281A G313A G319A G326A G332A G333A G359A G372A G373A G379A G381A G389A G415A G420A G456A G480A G482A G489A G510A G515A G561A G571A G650A G700A J304A J306A J307A J311A L800A Z117A	K002A K007A K008A K013A K015A K016A

Appendix 9.6 Comparison of the Change in Volume by Procedure Category per Physician 1989/90 to 1993/94 Between the HSC Paediatricians and the Ontario Paediatricians

Increase in HSC & Ontario		Decrease in HSC & Ontario		Change in Opposite Direction HSC Increase/Ontario Decrease		Change in Opposite Direction HSC Decrease/Ontario Increase	
Code #	Description	Code #	Description	Code #	Description	Code #	Description
Major Consultation							
A003A	GENERAL ASSESSMENT OFFICE	A263A	GENERAL ASSESSMENT	A005A	CONSULTATION		
		A265A	CONSULTATION	C265A	CONSULTATION		
		A613A	GENERAL ASSESSMENT				
		C263A	GENERAL ASSESSMENT				
Intermediate Assessment							
A565A	LIMITED CONSULTATION	A006A	REPEAT CONSULTATION	A266A	REPEAT CONSULTATION	A007A	INTERMEDIATE ASSESSMENT OFFICE
A614A	GENERAL REASSESSMENT	A264A	GENERAL REASSESSMENT				
		C262A	SUBSEQUENT VISITS UP TO 6 WKS				
		C264A	GENERAL REASSESSMENT				
		C266A	REPEAT CONSULTATION				

Increase in HSC & Ontario		Decrease in HSC & Ontario		Change in Opposite Direction HSC Increase/Ontario Decrease		Change in Opposite Direction HSC Decrease/Ontario Increase	
Code #	Description	Code #	Description	Code #	Description	Code #	Description
Minor Assessment							
		C267A	SUBSEQUENT VISITS FROM 7 TO 13 WKS	A261A	MINOR ASSESSMENT		
		C269A	SUBSEQUENT VISITS AFTER 13 WKS				
		P004A	MINOR ASSESSMENT				
Hospital Visits							
E030A	EMERG DEPT EQUIVALENT	C010A	SUPPORTIVE CARE	C101A	SPECIAL CARE ICU/CCU		
		C994A	NIGHTS SAT SUN HOLIDAYS FIRST PT	C268A	CONCURRENT CARE		
		G621A	NEONATAL INTENSIVE CARE 2ND DAY ONWARDS PER DIEM	G600A	NEONATAL INTENSIVE CARE 1ST DAY		
Diagnostic and Therapeutic							
G100A	HEMOPHILIA	G009A	URINALYSIS, ROUTINE	G313A	PROFESSIONAL COMPONENT	G010A	URINALYSIS, WITHOUT MICROSCOPY
G359A	SPECIAL SINGLE AGENT CHEMOTHERAPY	G196A	PENCILLIN HYPERSENSITIVITY SKIN TEST	G319A	MAXIMAL STRESS ECG PROFESS COMPONENT	G197A	SKIN TESTS PROFESS COMPONENT
G489A	VENIPUNCTURE ADOLESCENT OR ADULT	G271A	ANTICOAGULANT SUPERVISION	G372A	INJECTION INTRADERMAL INTRAMUSCULAR	G209A	SKIN TESTS

Increase in HSC & Ontario		Decrease in HSC & Ontario		Change in Opposite Direction HSC Increase/Ontario Decrease		Change in Opposite Direction HSC Decrease/Ontario Increase	
Code #	Description	Code #	Description	Code #	Description	Code #	Description
Diagnostic and Therapeutic, continued							
G561A	ECHOCARDIOGRAPH	G279A	INDIRECT TRANSFUSION	G373A	INTRADERMAL INTRAMUSCULAR FIRST INJECTION	L800A	BLOOD FILM INTERPRETATION
G650A	LEVEL 1 PROF COMP	G281A	CHEMOTHERAPY EACH ADDITIONAL INJECTION	G381A	CHEMOTHERAPY SINGLE INJECTION		
G571A	ECHOCARDIOGRAPH	G326A	CHRONIC HAEMODIALYSIS	G389A	INFUSION OF GAMMA GLOBULIN		
G700A	WHEN A PROCEDURE IS SOLE REASON FOR A VISIT	G332A	PERITONEAL DIALYSIS	G415A	ELECTRO ENCEPHALOGRAPHY PROFESSIONAL		
J307A	FUNCTIONAL RESIDUAL CAPACITY	G333A	HOME DIALYSIS	G480A	VENIPUNCTURE INFANT		
		G379A	INTRAVENOUS CHILD OR ADULT	G482A	VENIPUNCTURE CHILD		
		G420A	EAR SYRINGING	G515A	CALORIMETRY		
		G456A	EMG	J304A	FLOW LOOP VOLUME		
		G510A	HYPER ALIMENTATION UP TO 12 WKS	J306A	AIRWAYS RESISTANCE		
				J311A	FUNCTIONAL RESIDUAL CAPACITY		
				Z117A	CHEMICAL TREATMENT		

Increase in HSC & Ontario		Decrease in HSC & Ontario		Change in Opposite Direction HSC Increase/Ontario Decrease		Change in Opposite Direction HSC Decrease/Ontario Increase	
Code #	Description	Code #	Description	Code #	Description	Code #	Description
Counseling							
K002A	INTERVIEWS WITH RELATIVES 1 HALF HR					K007A	PSYCHOTHERAPY INDIVIDUAL 1 HALF HR
K013A	COUNSELLING PER 1 HALF HR					K008A	DIAGNOSTIC INTERVIEW WITH CHILD 1 HALF HR
K016A	GENETIC ASSESSMENT					K015A	COUNSELLING RELATIVES