EQUITY AMONG PHYSICIANS AND THE WISH TO REALLOCATE TIME

A Thesis Submitted to the College of

Graduate Studies and Research

in Partial Fulfilment of the Requirements

for the Degree of Doctor of Philosophy

in the Independent Interdisciplinary PhD Program

University of Saskatchewan

Saskatoon

By

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Spring, 2002

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ABSTRACT

Objective: To examine the relationship between perceptions of equity among physicians and the wish to reallocate time by creating a fitted, multistage model of the *equity-distress-wish to reallocate time pathway* using structural equation modelling (SEM).

Background: The reorganizing of work among various health care professionals and better management of scarce resources are seen as necessary for the delivery of effective and efficient health care. Physicians play a key role in the health care system, and any substantive changes in their work will require their cooperation. Gaining support from physicians for changes in the allocation of their time will depend, in part, on the degree to which these changes are seen to promote their professional and personal objectives. Whether physicians perceive their practice conditions to be equitable, and how they choose to respond to efforts by others to make changes in the work they do and the rewards they receive, has important implications for the successful reform of health care in Canada.

Design: A modified panel study using questionnaires mailed to a stratified random sample of 840 physicians in Saskatchewan and British Columbia. A total of 384 physicians responded at baseline (110 from Saskatchewan and 274 from British Columbia). At follow-up, 240 usable questionnaires were returned from the remaining 371 eligible respondents for a response rate of 64.7% (72 from Saskatchewan and 168 from British Columbia).

Measures: Reliable constructs were developed for: intrinsic and extrinsic equity; distress; coping with practice demands; and the four components of professional activity (patient

care, teaching and research, continuing education, and administration). Latent variables were created for: local health care conditions; distributive equity; wish to reallocate professional time; and wish to reallocate administrative time.

Results: SEM produced a well-fitted model (P = 0.112; NFI = 0.991; RMSEA = 0.029; P for Test of Close Fit = 0.965; and Hoelter 0.05 Index = 255) that explained a substantial amount of variance at each stage of the model, and supported the hypotheses of the main pathway. The contributions of practice condition variables to the model, however, were shown to relate almost exclusively to the equity stage of the model.

Discussion/Conclusions: *Inequity* was significantly associated with *distress.* In turn, *distress* was significantly associated with the *wish to reallocate time.* The *state of local health care* contributed substantially to perceptions of equity among physicians. The physician's *ability to cope with time demands* was associated with the *equity, distress,* and *wish to reallocate professional time* (patient care, teaching & research, and continuing education). *Wish to reallocate administrative time* was associated with time already allocated to administrative duties, but was not associated with *ability to cope with time demands.* The impact of inequity on the allocation of time and the organization of the work of physicians and other health care practitioners over time should be examined in a larger study of a longitudinal design.

ACKNOWLEDGEMENTS

Many individuals contributed to the successful completion of my PhD thesis. I would like to begin by thanking the members of my Examining Committee. I want to thank the Chair of the Examining Committee and the College of Graduate Studies and Research Dean's Designate, Dr. Anne Leis, for overseeing the examination of my thesis with inimitable grace and goodwill. I want to thank my External Examiner, Dr. Elmer "Moose" Struening, School of Public Health, Columbia University, for agreeing to travel up to the bald prairie to quiz me on the content of my tome, and for giving me the opportunity to appreciate his insight and humanity.

I want to thank the members of my Advisory Committee: Professor Katherine Ash, College of Nursing; Dr. B. Singh Bolaria, Department of Sociology; and Dr. John Rigby, Department of Management and Marketing, for their many suggestions and contributions to the project, and for their continued friendship and collegiality. I want to thank the Chair of Advisory Committee and the Graduate Chair of the Individual Interdisciplinary Graduate Programs, Professor Jon Gilles, for his steadfast support and encouragement over the past four and one-half years. Jon, I will never know all that you have done on my behalf, but I want you to know that I am very appreciative. I also want to thank my supervisor, Dr. Rein Lepnurm, Department of Management and Marketing, for his wise guidance, and for his unwavering support and friendship over the years. Like sailors home from the sea, the end of one journey only marks the beginning of the next, and the new adventures that await.

Besides the members of my Examining and Advisory Committees, there are many other individuals and groups who have contributed to the completion of my doctorate. I want to thank Dr. R Glen Beck, Department of Economics, for his contribution to the project, and for his wise counsel when the future direction of my program was tenuous. I also want to thank, Doug Bicknell, former Assistant Dean, College of Commerce, for his help in getting me started on my present path so many years ago. Doug, your "can do" spirit and the timely provision of Graduate Teaching Fellowships were more important than you may ever know.

I want to thank Dr. Gary Kachanoski, the former Dean of the College of Graduate Studies and Research, for smoothing out some of the more annoying bumps in the road, and I want to thank the staff of the College of Graduate Studies and Research, University of Saskatchewan for always going the extra mile and for taking pity on a poor graduate student. I also want to acknowledge the funding provided by the National Health Research and Development Program, Health Canada in the form of a National Health PhD Fellowship from September 1999 to June 2000. Finally, I want to thank Dean Dennis Gorecki and everyone associated with the College of Pharmacy and Nutrition, University of Saskatchewan for giving me the time I needed to complete my thesis, and for providing me with an academic home and a place to grow.

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For Zachary and Delanie,
And always for Ba-de-du

Love Du-de-ba

Introduction and Statement of Principal Objectives

"Equity Among Physicians and the Wish to Reallocate Time" applies an interdisciplinary approach to the study of the relationships between equity, distress and the work of physicians, drawing on motivational and organizational theories, health systems administrative science, and medical sociology. The Independent Interdisciplinary PhD Program of the College of Graduate Studies and Research at the University of Saskatchewan provides an effective means to address the study's objectives by foregoing a single disciplinary orientation in favour of a more holistic approach.

The genesis of the study was a survey of 1030 Saskatchewan physicians by Lepnurm and Henderson in 1992. The primary findings of the Lepnurm and Henderson study were that the objectives of clinical teamwork, continuing education, teaching and research, preventive medicine counselling and administrative duties were best achieved by salaried methods of payment, and that the objectives of patient care, clinical autonomy and adequacy of income were best met by fee-for-service methods of payment (Lepnurm, 1996). In an independent examination of the same data, significant differences were observed between physicians who felt that their remuneration was fair, and physicians who felt that their remuneration was unfair, in terms of how they would prefer to allocate their time to "wellness" activities (Dobson, 1997).

In expanding the investigation of the role of equity in the work of physicians, remuneration was one of a number of factors contributing to the perception of fairness as

it related to the rewards received by physicians for services rendered. Differences in perceptions of fairness can also be due to differences in the availability of intangible rewards and to variations in the physician's practice setting and working conditions. These non-monetary factors may potentially be more important than monetary incentives in maintaining positive equity among physicians.

Making these concepts operational gave rise to a *practice demand-practice setting-equity* triad in relation to the physician's *wish to reallocate time* (Figure 1). Based on this initial model, the physician's workload (practice demands) and the practice setting (practice environment, level of integration and method of remuneration) are seen to contribute to the physician's perception of equity. In turn, the physician's perception of equity was seen to act as a motivator for behavioural changes designed to restore equity.

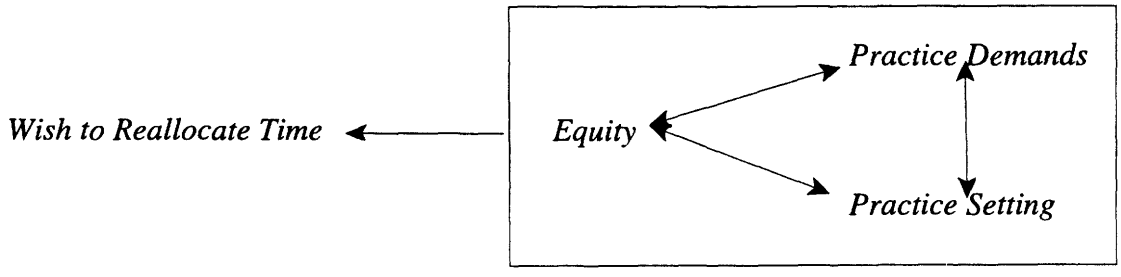

Figure 1: Conceptual Starting Point

In reviewing the literature, it soon became apparent that the relationship between the variables was more complex. The role of an intervening variable between equity and wish to reallocate time was suggested by the work of Van Dierendonck et al. (1994, 1996). In their investigations of the relationship between patient demands and changes in physician attitudes, these researchers found that perceptions of inequity led to distress,

and that this distress was associated with changes in physician attitudes toward patients.

Rather than a biological or psychological response to stressful work conditions, distress is seen as an emotional response to an unfair situation, and acts to motivate the individual to correct the situation. The inclusion of distress in the pathway led to the conceptualization of a multiple stage model (Figure 2) with possible pathways between *wish to reallocate time, distress, equity*, and *practice conditions.*

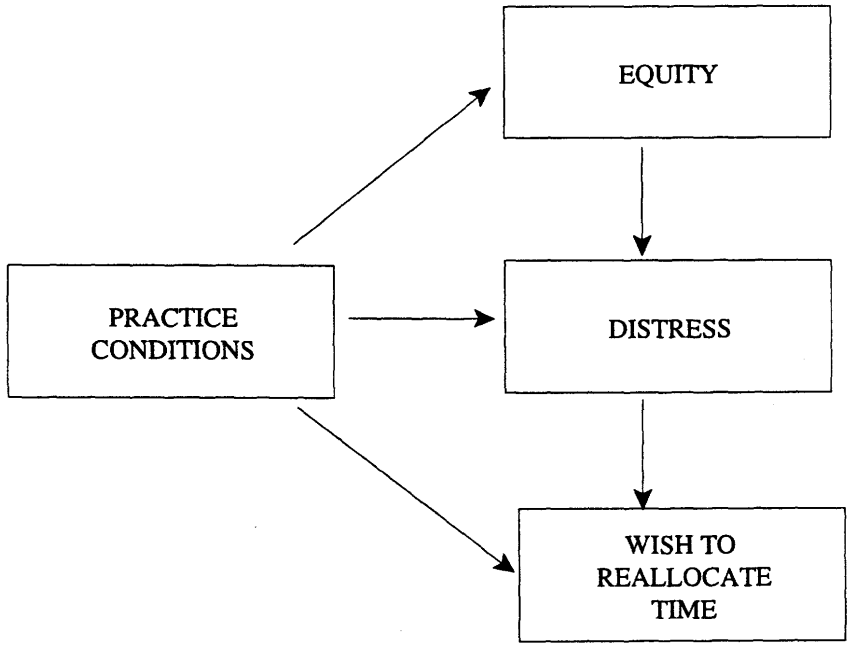

Figure 2: Proposed Model Pathways

The principle objective of this study is to extend the work previously carried out on the relationship between perceptions of equity among physicians and the wish to reallocate time (Dobson, 1997), by creating a fitted multi-stage model of the equity-distress-wish to reallocate time pathway using structural equation modelling (SEM).

1. The Work of Physicians and the Changing Health Care Environment

This chapter of the literature review will describe the work of physicians and how their time is allocated among a number of professional activities, including: patient care; teaching and research; continuing education; and administrative duties. In deciding how to allocate their time, physicians are confronted by changes in the conceptualization of health and the role of health care, changing relationships between health care provider groups, and a variety of health care reform initiatives. It will be shown that these changes are pressing physicians to abandon traditional practices and to reallocate their time in a manner consistent with these external constraints.

The ability of physicians to resist or delay these changes will also be discussed. The literature will show that despite some loss of hegemony, Canadian physicians are still able to control their time and the content of their work. This control has allowed them to allocate their time and pursue activities in support of professional and personal goals, rather than conforming to broader policy objectives. While various strategies have been adopted to encourage physicians to change their practices, these strategies have had only limited success or unintentional consequences.

The struggle between physicians and other health care stakeholders has also led to a practice environment where the rewards traditionally expected by physicians continue to be pursued while becoming harder to obtain. The literature will show that constraints with the practice environment combined with the ability of physicians to still control their

work and the allocation of their time has resulted in practices that sometimes conflict with other important the professional and personal objectives, as well broader policy objectives of the health care system.

1.1 The Work of Physicians

Weisman and Teitelbaum (1987) defined the work of physicians as, "those hours spent on patient care, teaching, research, professional development, and administrative tasks." Groenewegen et al.(1992) made a further distinction, defining two types of professional work: direct patient care and other activities. Other activities included: practice administration, education, and consultations with colleagues. Tompkins et al. (1996) reiterated this dichotomy of the work of physicians, advising that one must track the time allocated to both patient care and non-patient centred activities in order to fairly represent the entire contribution of the physician. Hurley (1986) presented the physician as a health care professional performing four key and often conflicting roles or activities: healer, technician, advocate and manager/rationer. More recently, Morrison (2000) cited eight key roles that physicians will be expected to play in the future including: clinical data collector, shaman, health advisor and wellness coach, knowledge navigator, proceduralist, diagnostician, physician manager, and quality assurance specialist.

For each activity, a minimum time commitment by the physician is required to ensure the activity is carried out in an effective manner. For most physicians, the majority of their time is devoted to the delivery of patient care (Sullivan & Buske, 1998; Chan et al., 1998). Patient care activities carried out by physicians are diverse and occur

in a variety of health care settings (Lepnurm, 1996), however, most can be broadly described as the assessment and treatment of disease, either by the individual physician or as part of a multi-disciplinary team. In either case, the physician assumes a central position in the delivery of patient care services, with emphasis on the roles of healer and technical specialist (Hurley, 1986).

Due to the growing importance of chronic diseases as a share of the medical practice, and the importance placed on health promotion and disease prevention, physicians are frequently called upon to counsel patients on health issues and to encourage their participation in the maintenance of their own health and well-being (McAvoy et al, 1999; Jaen et al., 1994). Because of these new demands and expectations, physicians increasingly rely on other health care professionals to assist them (Bezjak, 1987), or to take on the principal provider role (Aquilino, 1999). The physician must then assume the role of coordinator or case manager, allocating tasks and communicating with others to ensure optimal patient care.

Patient-centred services draw on the traditional training and skills of the physician, but increasingly require the physician to work within a health care team. The physician is also expected to coordinate care and communicate effectively with patients and with other health care providers (Morrison, 2000; Hurley, 1986). Most physicians allocate a substantial portion of their time to patient-care activities, and generally speaking, would prefer to spend more time with their patients (Blendon et al., 2001).

Non-patient centred activities are also an important part of medical practice. These activities affect the quality of care delivered to the individual patient, but also the

overall quality of medical care and the health care system as a whole, by promoting and maintaining: knowledge; skills; and the efficient use of resources. Among the non-patient centred activities carried out by physicians are: teaching and research; continuing medical education; and practice administration.

Although teaching and research activities often involve the participation of patients, these activities are generally engaged in by the physician for the purpose of creating and transferring knowledge to medical students, practising physicians, and other health care providers. As such, they represent opportunities to apply and develop areas of expertise, and to receive rewards not directly tied to patients and the delivery of medical services (Eliason et al., 2000; Hartley et al., 1999; Dodson, 1998).

Continuing medical education is another important activity carried out by physicians, and most physicians are concerned about their ability to keep up with the latest advancements (Blendon et al., 2001). With rapid changes in standards of practice and an ever expanding knowledge base, dedicating time to keeping up with the medical literature is an essential part of ongoing professional development (Miller et al., 1998).

The challenge of maintaining an acceptable level of knowledge about current medical practices can be burdensome due to high workloads and an overall lack of time (Ockene & Zapka, 2000; Miller et al., 1998; Johnson et al., 1997). At the same time, investing time and effort to meet these requirements allows the physician to participate in activities that can be professionally enriching and intrinsically rewarding (Fulkerson & Wang-Cheng, 1997; Kelly & Murray, 1996).

Finally, in light of growing concerns about the cost of care and the appropriate allocation of resources, physicians are now expected to play a much more active role in the administration and evaluation of health care services (Morrison, 2000). Such activities are less likely to fall within the parameters of traditional medical training (Schwartz & Pogge, 2000), and as such, often require additional effort and time from the physician to develop a reasonable level of proficiency (Carty et al., 1996). Unfortunately, given the reasons most individuals elect to become physicians in the first place (Vaglum et al., 1999), the rewards associated with greater involvement in administration and in the development of the necessary management skills, are often less evident or perceived as less desirable than the rewards associated with other professional activities.

In carrying out their many diverse activities, physicians are expected to: provide a very high standard of care; advocate vociferously on behalf of their patients; provide appropriate training to other health care providers; advance the understanding of disease and its treatment; and properly maintain and develop their own skills, while effectively managing the resources of the system. In meeting these expectations, a substantial demand is placed on the physician's time and abilities. In exchange, physicians have come to expect substantial benefits, including: relatively unrestricted authority over the treatment of disease; the opportunity to participate in interesting and challenging work; higher status; and a relatively good income (Epstein et al., 1993, Williamson et al., 1993).

Through most of the last century, this arrangement appeared to work to the mutual benefit of both physicians and society (Starr, 1982; Parsons, 1951). In more recent years, however, physicians have been pressed to take on new administrative tasks and other, less

traditional duties. These duties often must be carried out in addition to the physician's fundamental duty to provide quality care and maintain requisite clinical skills.

Spending more time on less traditional activities can be an opportunity to develop new skills or to pursue new areas of interest. As such, time spent on these activities can enrich the physician's work experience and can be rewarding, in and of themselves. Alternatively, new tasks may represent additional burdens to physicians. As a result, new tasks or expanded responsibilities may be viewed as trivial, monotonous, or overly demanding; preventing the physician from spending time on personally or professionally rewarding activities. In addition, these activities are often not remunerated, or are remunerated at a lower rate of pay than patient care services, requiring the physician to forego income to carry them out.

Unfortunately, very little consideration has been given by policy makers and administrators to the inherent value of these activities to physicians. Non-clinical activities associated with the modern medical practice are generally given only marginal consideration when determining fee structures (Wright, 1996). The training required to take on new roles is often inadequate (Carty et al., 1996), and for the most part, financial rewards are still based on the volume of clinical services provided to patients, and the efforts and demands placed on physicians to deliver these services (Feldman et al, 1994; Hsiao, et al., 1988). Not surprisingly, many Canadian physicians now perceive themselves to be overworked and underpaid (Sullivan & Buske, 1998).

Given the traditional goals of physicians and their ability to control the nature of their work and the allocation of their time, many physicians can be expected to resist or

abandon tasks that, while valuable to the system as a whole, may be seen as being of less value, or too time consuming for the individual physician. The challenge for policy makers and health system administrators, given existing organizational constraints and physician preferences, is finding effective ways to encourage physicians to allocate more of their time toward activities likely to benefit the health care system.

1.2 The Changing Health Care Environment

Canadian physicians work in a system that is best described as a sickness-based model of care. For decades, the emphasis of the system has been the delivery of physician and hospital-based services focussing on the identification, treatment and curing of disease and illness. Hospital and physician-based services are publicly funded, and account for the majority of health expenditures (Health Canada, 1999). To a lesser degree, services such as prescriptions drugs and dental care are publicly financed, using age and need-based criteria to determine eligibility. Most Canadians have some form of private insurance through their place of employment for services not funded publicly, or receive supplemental coverage through social assistance programs. Only a small minority of Canadians, primarily the self-employed and those not able to qualify for social assistance, lack prospective coverage for services not covered by Medicare (WHO, 1996).

Canadian physicians function as the gatekeepers to the system and, as in most Western industrialized countries, serve both as advocate for the patient and as the principal decision-maker in the allocation of health care resources (Minogue, 2000; Franks et al., 1992). Patients are free to choose their own family physician, but are

generally guided by the preferences of their physician in choosing therapies (OECD, 1994). Access to intensive or special medical treatment is somewhat restricted, and the patient's choice of specialists is greatly influenced by the family physician. Once a patient has been referred, specialists often follow practice patterns similar to the general practitioners, influencing patient care decisions and determining resource allocation.

Within the Canadian health care system, physicians also have an important role in the actual delivery of health care services (Barer & Stoddart, 1992a; Franks et al., 1992; Shortell, 1974). Through the gatekeeper function, physicians determine the services provided to the patient and, to a large extent, oversee the delivery of these services. However, changes occurring in the health care environment are increasingly affecting physicians and the nature of their work; both in terms of its content and the manner it which it is organized and integrated into the larger health care system (Arnetz, 2001).

These environmental changes can be classified along three distinct, but fundamentally interconnected, themes: an evolution in the understanding of the factors that contribute to health; changes in the relationships between health care providers; and system-wide changes in health care funding, administration and delivery of health care (health care reform). The cumulative effect has been a re-configuration of the role that physicians are expected to play, as well as the roles of patients, administrators, and other health care providers in the delivery of health care services.

1.2.1 Changing Concepts of Health and Health Care

For most of the twentieth century, the delivery of health care, the roles of the

various health care professions, and the relationships between major health care stakeholders have been largely determined by the medical model and its chief proponent, the medical profession (Engel, 1977). Beginning in the 19th Century, the medical model promoted the concept of a normal state of health and the delivery of health care services (primarily by a physician) based on scientific objectivity. Illness and disease were seen to have specific causal agents, with treatment based on the identification of specific pathology. The medical model also subscribed to *dualism* which promoted the separation of mind and body, and *reductionism* which viewed the human body as a biological machine best understood by the detailed examination of its parts (Roberts, 1994).

The medical model became the foundation for the professional and economic success of physicians. By employing the 'new' medical model, the medical profession was able to demonstrate that it could effectively control and cure many diseases (Starr, 1982). Physician care, based on the medical model, was increasingly associated with effective health care.

Broader public acceptance of the medical model was facilitated by the position of physicians in the delivery of health care and within the larger society (Parsons, 1951). In the late 19th and early 20th Centuries, groups were often defined by the role they were seen to play within society (Reidy, 1984), so that the authority of an "effective" medical profession over matters of health went largely unchallenged (Parsons, 1951). This conceding of health authority to physicians gave the medical model almost complete control over how illness and disease would be defined and treated.

Having gained supremacy, the medical model and its chief advocate, the physician, successfully maintained their authority over matters of health throughout most of the twentieth century. This was due in large measure to the Flexner Report of 1910 (Coburn et al., 1983). At that time, there were a large number of medical schools of varying quality and competing practice philosophies (Starr, 1982). In response to growing concerns within the medical profession, the famed educator Abraham Flexner was asked to evaluated the quality of the education provided by medical schools in the United States and Canada. Medical schools of poorer quality were identified by Flexner and many were closed, greatly limiting the supply of new physicians while improving the economic situation for existing practitioners.

Schools that did not subscribe to the medical model articulated by Osler and other like-minded proponents of allopathic medicine also fared poorly in Flexner's report. Following the release of the "Report" in 1910, many of these "unorthodox" schools were eventually compelled to shut down. Some schools of osteopathic and chiropractic medicine survived, but were largely marginalised by an increasing influential medical profession. In the end, the narrow bio-mechanical concept of health advanced by allopathic schools of medicine came to be seen among most health care practitioners as the only legitimate approach to health care (Coburn et al., 1983).

In time, the limitations of the medical model became evident. In most industrialized countries, the morbidity and mortality associated with acute infectious diseases were gradually replaced by a preponderance of chronic non-infectious ailments. These "new" diseases were often resistant to medical intervention (Terris, 1992). As

well, epidemiologists had begun to show that medical care had relatively little impact on health compared to improvements that could be brought about by better nutrition, sanitation and economic status (Drummond et al., 1987; Lalonde, 1974). As a result, the illness-based medical model that had served the medical profession so well was supplanted in the minds of many by more comprehensive models of health and health care (Terris, 1990; Webster, 1985; Engel, 1977).

The principal models of health that now challenge the allopathic medical model are the *social* model and the *holistic* model. The social model emphasizes the environmental and social causes of disease and holds the larger society and its political and economic manifestations accountable for maintaining health and eliminating illness (McBeath, 1991). The legitimacy of medicine as a contributor to health is still recognized, but health care services are more often seen as supporting rather than ensuring good health (Terris, 1990).

While somewhat similar to the social model, in that it recognizes the limited role of medical care, the holistic model argues that there are no universal norms of health and that the definition of health will vary across cultures and individuals (Jensen & Allen, 1993). The dualism and reductionism of the medical model are thoroughly rejected in favour of the concept of the interdependence of the body, mind and spirit (Armentrout, 1993). Like the social model, the holistic model prefers to deal with the causes of disease rather than the mere control of symptoms (Dever, 1991). Unlike supporters of the social model, who seek to integrate the medical model within a broader approach to health care, advocates of the holistic model suggest the application of the

medical model ends when symptoms of disease have disappeared (Jensen & Allen, 1993).

Proponents of the holistic model further argue that the medical model fails to secure health and well-being (Webster, 1985). Some have gone so far as to suggest that traditional (allopathic) medicine is not capable of taking up the actual practices associated with more holistic care, and that integrating these models may not be possible (Roberts, 1994; Armentrout, 1993), nor desirable (Craddock & Reid, 1993).

Physicians are generally aware of the limitations of the medical model, and have sought to accommodate these competing models of health by subsuming behaviour and life-style into a newer version of the medical model; the bio-psycho-social model (McAvoy et al., 1999; Arnetz, 1996). Indeed, the concepts of health promotion and disease prevention are now accepted into the medical orthodoxy as integral to maintaining good health.

While patient behaviour and life-style modification are aspects of health care over which physicians seek to exercise authority, the actual adoption of competing health models is most common among nursing and allied health professionals (Armentrout, 1993; Roberts, 1994; Robertson & Minkler, 1994). Physicians are more inclined to limit their preventive activities to counselling their patients against smoking, or encouraging them to exercise more (McAvoy et al., 1999). Due perhaps to their ideological orientation, or because these proactive "counselling" services do not provide compensation comparable to reactive, intervention-based medical services, physicians have generally failed to incorporate health promotion concepts into their daily practices (Pineault, 1984; McEwen, 1977). On a practical level, most physicians continue to

follow a model of health care based primarily on the assumptions of the medical model.

1.2.2 Changing Health Care Provider Relationships

In support of a more broadly defined concept of health, a number of factors are seen to affect health care delivery. These include: technological advances; demands for new health services; stagnant health care budgets; and a growing expectation that patients should be more actively involved in their own health care (Simpson, 1998; Mhatre & Deber, 1992). In response to these changes, health care systems are making greater use of multi-disciplinary teams when determining health needs and in the delivery of care (Tremethick & Wallace, 1999). Greater interdisciplinary collaboration and service integration have also meant an expanded role for non-physician providers in the delivery of patient care (Bluml et al., 1999; Kizer & Norby, 1998).

The multi-disciplinary health care team is particularly useful in the new health care environment. It allows for a greater number of perspectives when evaluating or treating a patient, it offers the potential to reduce costs through the use of non-physician providers, and the health care team improves access for its members to expertise across a variety of disciplines (Leaviss, 2000; Ray, 1998). Empirical research also provides good evidence that a multi-disciplinary approach leads to better outcomes for patients (Feiger, 1979; Rubenstein et al., 1984; Wood-Dauphinee, 1984; Knaus et al., 1986; Lamb, 1991). As a result, the multi-disciplinary health care team, rather than the individual practitioner, is now the preferred method of health care delivery in a variety of clinical settings (Hibberd, 1998; Wilson, 1998; Huffman, 1993; Hardy & Conway, 1988).

Despite its advantages, health care systems have been slow to adopt this model of health care delivery due to a number of factors (Hutchinson et al., 2001). First, there is a discrepancy between physicians and other groups of health care providers over how care should be organized (Gutkin, 1997; Temkin-Greener, 1983). While other groups seek to participate more fully in patient care, physicians are inclined to see nurses and allied health providers as physician extenders (Bezjak, 1987). Even when other professional groups are able to assume the principal provider role, they are often perceived by the public as a less than desirable substitute for physician-based care (Lamb, 1991). This is complicated by the fact that most physicians seem unwilling to accept the idea of shared responsibility and decision-making authority (Buknoda, 1996).

Second, other professional groups often differ from physicians in their approach to treatment and healing; physicians tend to focus on treating specific diseases while groups such as nursing adopt more holistic perspectives. At the same time, increasing awareness of the determinants of health and the contribution of medicine to individual well-being are causing other health professions to reassess the expertise and relative importance of physicians (Lamb, 1991).

Finally, non-physician groups tend to value teamwork and its associated practices more than physicians (Buknoda, 1996). A shift in the perceived value of the work of physicians is causing other stakeholders to question the role of physicians, including their previously unassailable leadership position in the delivery of care (Arnetz, 2001).

Attempts to expand or change professional roles within the multi-disciplinary setting, however, are as much a struggle for resource control, professional aspirations, and

a larger share of the health dollar, as they are about concerns over responsibility, the appropriate assignment of authority, and the ability to deliver quality care (Hardy & Conway, 1988). Changes in the social and political roles of women, for example, have manifested themselves in health care as the demand by female dominated professions, particularly nursing, to have a voice in the running of the health care system.

In addition to the greater role demanded by the female dominated professions, social and economic changes have allowed the re-emergence of a number of health professions (e.g. midwives, homeopaths, etc.) that had been suppressed or absorbed by the medical profession almost a century earlier (Coburn et al., 1983). Newly empowered health professions are actively seeking to expand their professional domains to secure an economic advantage previously denied due to the dominant position of physicians (Freidson, 1989).

Many of the new provider groups have adopted individualistic-lifestyle paradigms to differentiate themselves from physicians (Armentrout, 1993). The threat to medical authority is further enhanced by research showing the limited contribution of traditional medical services (Terris, 1990; Lalonde, 1974). As a result, these new provider groups are able to extract clinical autonomy and economic benefit from the health care system, often at the expense of the medical profession.

Allied health professionals such as pharmacists, physiotherapists, and nurse practitioners have also begun to challenge the physician's control over patients and resources within the health care system (Arnetz, 2001). In questioning the clinical authority of physicians, these groups often promote themselves as experts in specific

areas of health care. Nurses now promote themselves as the patient care experts, pharmacists as the drug experts, and physical therapists as the rehabilitation experts (Hardy & Conway, 1988).

With greater recognition of their expertise, these traditional provider groups are able to promote themselves as the more appropriate service provider; gaining authority to carry out activities traditionally offered by physicians and, through these activities, gaining greater access to patients, resources and economic rewards (Cooper, 2001).

There is also a growing desire among provincial governments to delegate authority away from physicians (Fyke, 2001; Marriott & Mable, 1998; Leatt et al, 1996; Simard, 1992). To improve both efficiency and the quality of care, some attempts have been made to redefine the professions and the authority needed to carry out specific activities (Coburn, 1993). These efforts are largely based on the belief that patients and the health care system would be better served by replacing clinical authority based on credentials, with clinical authority based on the abilities of the provider. By eliminating the monopolistic control created by licenses and credentialing, providers would be allowed to treat patients only after demonstrated competence, reducing the importance of professional affiliation. Less reliance on credentials could also reduce conflicts based on maintaining monopolistic profession-specific authority, encouraging a more integrated, collaborative approach toward health care delivery (Cooper et al, 1998).

A recent example of a government supported incursion by another health profession into a traditional area of medical authority was the decision by British Columbia to allow pharmacists to directly prescribe post-coital contraception (the

morning after pill) without the authorization of a physician (BCPA, 2000). Despite concerns raised by physicians and the British Columbia Medical Association, the perceived expertise of pharmacists in drug therapy rather than their credentials *per se*, was essential in the ultimate decision by the government to allow them to take on this authority. No longer requiring the permission of a physician-based regulatory body, such policy decisions blur the line between the physician and other health care providers in delineating authority and in determining who will occupy the role of the patient's primary advocate and care provider.

Despite some incursions on the authority of physicians and ongoing attempts by health care systems, professional organizations, and regulatory bodies to expand the role of nurses and other allied health professionals, physicians continue to exercise considerable influence within the health care setting (Detsky, 1993; Evans , 1992; Drummond et al., 1987). Most health care is not still not integrated (Hutchinson et al., 2001), and the physician is still the patient's main contact with the health care system (WHO, 1996). Defining the scope of practice and medical authority still rests primarily with physicians, and the roles of nursing, pharmacy, and other professions in health care delivery are still largely subordinate to the physician.

1.2.3 Health Care Reform

The disproportionately large role that physicians have played and continue to play in most areas of health is well understood (Health Canada, 1999; Terris, 1990; Rosen, 1989). Because of their large role, the decisions made by physicians greatly impact on

the type of care received by the patient (Siu et al., 1986; Kemper, 1988), as well as the efficiency of the health care system (Hutchinson & Foley, 1999). The ability of patients to access the system and the quality of care depend to varying degrees on the choices made by physicians (Godwin, 1996; Alter et al., 1999, Cox et al., 1996; Epstein, 1991; Wenneberg et al., 1987). Licensing requirements and a credential-based regulatory environment still maintain physician authority over most aspects of health care, and the emphasis on the biophysical component of illness tends to negate the contributions of other groups of health care providers. Public deference toward medicine is still strong, and the authority of the physician continues to be supported by the public.

However, with concerns about the effectiveness and efficiency of health services, changes in our conceptualization of health, and demands for changes in the role of various health care providers, it was inevitable that attempts would be made to reconfigure the health care system. Historically, the principal objective of the Canadian health care system has been to provide equality of access to necessary medical care. While relatively successful in attaining higher levels of health for all its citizens, by the late 1980s, persistent class-based disparities in health status illustrated the limits of the current medical care system in achieving an equitable distribution of health (Epp, 1986). At the same time, the health care system was facing a number of challenges arising from changes in the social, political and economic environment of the country, and there were a number of persistent problems within the health care system itself (Evans, 1992).

In an attempt to deal with these issues, various provincial commissions were established to determine how best to carry out health care reform (Mhatre & Deber,

1992). While the review processes differed between provinces, several common themes were identified: shifting from institutional interventionist care toward health promotion; increasing disease prevention and non-institutional delivery; enhancing regional governance and management structures; addressing the need for sustainable funding; establishing comprehensive management of health human resources; increasing the use evidence-based decision making; promoting the wide-spread adoption of the determinants of health framework; and enhancing system accountability (WHO, 1996).

The recommendations of the provincial commissions represented what was seen to be the most appropriate strategies for improving the overall efficiency and efficacy of the system, while also addressing the principle objective of "achieving health for all". In response to the recommendations of the various commissions, enabling legislation and a variety of programs were initiated by most provinces, and followed five general themes: promote the determinants of health; shift the system away from intervention toward health promotion and disease prevention, move toward the regionalisation of services; pursue cost containment; and improve human resource management (WHO, 1996).

The extent to which the recommendations of the commissions were adopted by health care organizations varied considerably (Lomas et al., 1997). Given the wide dissemination of the proposed health reforms, there was strong rhetorical support for the initiatives, both from the Ministries of Health and the health care organizations who depended upon the Ministries for most of their funding. However, a number of the reforms represented a substantial threat to influential stakeholders, including physicians (Mhatre & Deber, 1992).

In areas where non-compliance did not impede the overriding imperative of cost control, there was considerable variance between the expressed policy objectives of health care reform and the rate of implementation. Most provinces adopted some form of regionalisation, but there was a general lack of evaluation as to its effectiveness. Commissions called for ways to shift the focus away from physicians and institutional care, but the emphasis placed on health promotion and disease prevention was mostly rhetorical. As well, recommendations relating to human resources were not fully implemented (Lomas et al., 1997), and continue to be a major area of concern.

Ten years after the first initiatives, reforms relating to regionalisation and devolution of managerial authority have occurred in most provinces (Lomas et al., 1997), and the provinces have successfully constrained health care costs: down from more than 10% of gross domestic product in the mid-1990s to around 9% of GDP toward the end of the decade (OECD, 1998). However, a number of the problems continue to persist (Manga, 1998), and it is debatable whether real progress has been made in creating a more effective, efficient, or equitable health care system.

1.3 Promoting Change in the Work of Physicians

When deciding how best to allocate their time or to organize their practices, physicians can be expected to consider their own professional and personal objectives, and the needs of their own patients, but are less likely to consider the needs of the larger health care system. Therefore, health care systems have found it necessary to develop strategies that encourage physicians to adhere to broader policy objectives.

In their efforts to promote changes in the practice patterns of physicians, health systems use a variety of strategies to influence and control behaviour (Cybert, 1997; Collins et al, 1994; Toon, 1994). Lomas et al (1989) suggest that a number of factors, including economic, administrative and social factors, should be considered when attempting to change physician behaviour. Greco and Eisenberg (1993) concurred that a variety of methods can be used to influence physician behaviour and found that a combination of methods to be more effective than any single approach. The scope with which such strategies are applied will vary and with varying levels of success.

1.3.1 Current Strategies for Promoting Change

Common strategies used to promote changes in physician behaviour include: 1) increasing awareness of best practices through training and continuing education; 2) enacting regulations to control income levels and the movement of physicians, and 3) adopting a specific method of remuneration to take advantage of the inherent incentives associated with that method.

Training and Education: The formal training of physicians has long been fundamental to professional self-regulation and the dissemination and adoption of new ideas and practices (Huffman, 1993). For example, the gatekeeper role assumed by general practitioners in most Western countries is more a function of their professional training and socialization, than a reflection of specific financial incentives or regulatory controls (Reagan, 1987). In addition to the behaviours created by formal training, ongoing education is also perceived as an effective way to modify physician behaviour,

and in the appropriate setting, can produce real and sustained changes in physician practices (Schectman et al, 1991).

Regulation: When health care costs began to escalate in the 1980s, some provinces attempted to control expenditures by modifying the rules used to govern payments to physicians by introducing global expenditure caps and by de-listing some services (Barer & Lomas, 1996). Since then, all provinces have adopted some form of global expenditure cap, specifying a total budget for medical for a defined period (Katz et al., 1997; Hurley & Card, 1996). To the extent that total expenditures for medical services have been brought under control, these policies have been effective. However, such policies were not able to control the types of services provided by physicians, nor where physicians choose to practice their profession.

Lacking controls on physicians practices, a number of provinces sought to discourage specific behaviour through, restricted formularies; clinical guidelines; and other forms of regulatory action. In British Columbia, for example, with an over-supply of physicians in the larger centres, the provincial government introduced Bills 24 and 41 as a way to restrict the supply of new physicians in Vancouver and Victoria, in favour of the under-served parts of the province (Rosen, 1989; Barer, 1988).

Remuneration: In addition to restrictions on how much one can earn and where one may practice medicine, explicit financial incentives and penalties are often used to influence the behaviour of physicians (Goodpastor & Montoya, 1996: Scott & Hall, 1995; Shimmura, 1988). In the United States of America, for example, financial incentives and holdbacks are often used to encourage physicians to adopt cost-minimizing practices

(Grumbach et al., 1998), or to comply with policy objectives (Shortell et al., 1996).

The inherent incentives associated with a particular method of payment can also affect physician behaviour (Tompkins et al., 1996; Hickson et al., 1987; Kristiansen & Hjortdahl, 1992; Lahaie & Chopyk, 1992; Pineault et al., 1985). In Canada, most physicians are paid fee-for-service by the public insurance system, although other methods of payment, such as capitation, salary, or a combination of methods, are also employed by a substantial minority (CCHSE, 2000). Each method has certain advantages and disadvantages for physicians, patients and third party insurers (Hickson et al., 1987; Kristiansen & Hjortdahl, 1992; Kristiansen & Mooney, 1993; Hemenway et al., 1990; Lahaie & Chopyk, 1992; Pineault et al., 1985).

Under fee-for-service, physicians are relatively immune to the cost of the care that they recommend to their patients. While this may allow the physician to act in the best interests of the patient as an unbiased advocate, it can lead to the misuse of scarce resources through costly and marginally beneficial procedures (Tompkins et al, 1996). Fee-for-service is generally favoured by physicians, but is seen to promote over utilization of expensive technologies and an orientation toward patients with complex illnesses and diseases (Lepnurm, 1996). Alternatively, capitation creates incentives to provide low-cost care at the expense of patient welfare (Emmanuel & Brett, 1993). Although capitation is seen to promote greater use of primary care and prevention strategies, it introduces the potential for cream-skimming and under treatment (Chaix et al, 2000; Van Barneweld et al., 1998; Grumbach et al., 1998; Franks et al, 1992). Salary is seen neither to promote over utilization or under utilization *per se*, but has been

perceived as reducing the physician's autonomy and of compromising their role as the patient's advocate (Hagland, 1999; Lepnurm, 1996).

Methods of payment can also affect how physicians respond to changes in practice demands. Under fee-for-service, physicians may respond to added responsibility by working more hours, provided additional compensation is forthcoming. Under capitation, new activities are incorporated into the practice by spending less time on other activities. Under a salaried system, new responsibilities tend to replace old responsibilities or are not incorporated at all (Calnan et al., 1992). Groenewegen et al. (1992) found that a mixed method of payment might be more appropriate to properly reward non-patient activities such as continuing education, peer review, and interdisciplinary cooperation,.

1.3.2 The Limitations of Current Strategies

Education: Although effective in promoting specific patterns of practice, the socializing of individuals to adopt specific professional norms and values tends to isolate one professional group or specialty from another. Medicine and other health professions have created education and training curricula that often discourage interdisciplinary collaboration and cooperation. The socialization process inherent in the intense educational programs of medical students tends to isolate medical students from other health care approaches, making effective communication and teamwork more difficult once the physician enters the work environment (Huffman, 1993). Furthermore, studies indicate continuing education programs have only limited influence on physician behaviour, and the effect is often transient (Goodpastor & Montoya, 1996).

Even when education is effective, in that the physician is aware of a more appropriate method of care, less appropriate methods can persist (Ockene and Zapka, 2000; Lomas et al, 1989). For example, in a study of Dutch general practitioners, Veldhuis et al (1998) found that physicians often deviated from what they knew to be the standard of practice in order to comply with patient preferences, and their own desire to accommodate these requests.

Regulation: As a regulatory initiative, global caps on physician payments have effectively controlled the total cost of payments to physicians, but often lead to the skewing of physician reimbursement. Some physicians continue to generate high incomes by seeing a higher volume of patients or by carrying out a higher number of procedures (Chan et al., 1998a). Furthermore, physicians who persist with higher billing rates are rarely affected by funding constraints (Katz et al., 1997). Instead, the benefits of increased billing accrue to the individual physician while costs in the form of holdbacks or pay-backs are spread among all physicians (Hurley & Card, 1996). Reimbursement caps and clawbacks limit income levels, but rarely reflect the workloads assumed by individual physicians, or those who's skills are in high demand. The result is often an unfair distribution of economic benefits within a single reimbursement system.

In seeking to regulate demand and redistribute the physician supply, governments may restrict access to billing numbers or reduce fee schedules for physicians moving into over-serviced areas (Katz et al., 1997). However, such restrictive policies primarily affect new physicians. Physicians already practising in over-serviced areas are rarely targeted. The discriminatory nature of these policies invariably leads to legal recourse by the

physicians affected, and a number of successful court challenges have been the result (Barer, 1988; Levine, 1997).

A number of Canadian physicians have also responded to increased regulation by moving, either inter-provincially or to the United States. Interestingly, while there has been great public concern about the loss of physicians and fear of a doctor shortage, the loss of physicians to the United States is a decades-old phenomenon, and the net impact on the supply of physicians in Canada has been minimal (Evans, 1998). However, those remaining are increasingly frustrated and dissatisfied with the health care environment, and are often inclined to oppose policy initiatives perceived to erode their position within the system (Sibbald, 1998; Stevenson et al., 1988).

Remuneration: To reduce utilization and costs, alternatives to fee-for-service have been considered and implemented to varying degrees in most jurisdictions (CCHSE, 2000; Victoria Report, 1995; Deber et al., 1991). However, these alternative methods are generally limited to small pilot projects, and of a voluntary nature. Although increasingly acceptable to physicians (Lepnurm, 1996; Woodward et al, 1996), the use of alternative payment methods among Canadian physicians is not wide spread, and the fee-for-service method of reimbursement continues to dominate (CCHSE, 2000).

Determining the form of remuneration that best supports the provision of all necessary medical services, while curtailing unnecessary services, is difficult in the best of circumstances. Whether it be fee-for-service, salary, capitation or some other form of compensation, one does not have to look far to find both supporters and detractors of a particular method of payment (Lepnurm, 1996; Reinhardt, 1985).

There is also the issue of the effect of incentives within specific methods of payment. Evidence suggests that physicians will change the intensity of their practice due to a change in the incentives rather than the method of remuneration (Hemenway et al., 1990; Hillman et al., 1989). For example, if a physician working in a clinic is drawing a salary, but future employment and promotion is contingent on the income that the physician generates for the clinic, then the physician may feel pressure to practice in a manner that generates more income. If the fee schedule continues to emphasize discrete quantifiable services, then the physician is operating in a *de facto* fee-for-service payment system focussed on curative activities.

In Canada, strategies used to affect physician behaviour have been relatively uncoordinated and lacking a broader policy focus. However, even when strategies are applied in a coordinated and focussed manner, the medical profession has shown a remarkable ability to minimize or eliminate the ability of others, such as third-party payers, to determine the nature and scope of their work.

1.3.3 Managed Care in the United States - A Case in Point

In the United States, managed care has employed all three strategies (education, regulation, and method of remuneration) in a more coordinated way in an attempt to control rising health care costs, while also seeking to enhance the effectiveness of the health services being provided. Yet, after ten years, one still finds a health care system that is surprisingly resistant to fundamental change (Kuttner, 1999).

Under managed care, improvements in the efficiency and quality of care are generally sought through a strategy of financial incentives and administrative procedures (clinical guidelines and utilization review) designed to limit over-servicing and curtail inappropriate use (Hurley et al., 1991). Primary care physicians are expected to coordinate and deliver patient care within a budget provided by managed care plan, and payments to these gatekeeper physicians are prospectively determined to encourage prevention services (Hoff & McCaffrey, 1996). Non-physician health providers assume a greater role in the care of patients, and greater emphasis is placed on provider and patient education, and the use of clinical guidelines (Ockene and Zapka, 2000).

It was anticipated that managed care would push physicians toward greater participation in a highly integrated, healthcare organization (McCullough et al., 1999; Cotter & Bonds, 1995), and indeed, the earlier managed care organizations (MCO) appeared to achieve this objective, resulting in better cost and quality control, substantial collaboration among providers, and strong member (patient) support. But, despite their initial successes, the ability of managed care to provide low cost, quality care in an integrated practice environment is now in some doubt (Kuttner, 1999).

Over time, price sensitive purchasers who were largely unaware or indifferent to issues of quality and access (Jensen et al., 1997), created downward pressure on prices. Increasingly cost-conscious managed care organizations in turn put pressure on primary care providers, and the specialists to whom they referred, to see a higher volume of patients, while reducing service levels and the cost of the services they did provide (Kuttner, 1999). Under constrained health care funding and intense price competition

from less integrated MCOs, the integrated health care model began to unravel.

Meanwhile, those physicians who could began to extricate themselves from the influence of a single managed care organization. In a classic example of an industry adjusting to the concentration of power among its customers, many physicians sought to reduce the power of the MCOs by increasing the number of MCOs to whom they provided services, or by banding together into larger practice groups to extract greater concessions (Hellinger, 1996). Specialists and specialties in short supply began to form regional monopolies to secure their incomes and to provide greater control over their own practices (Bodenheimer, 1999). Service fragmentation as the result of various physician and MCO behaviours was further exacerbated by a consumer backlash against MCO attempts to restrict access to secondary care (Kuttner, 1999).

Today, the more integrated managed care organizations struggle to compete with preferred provider organizations (PPOs) and independent practitioner associations (IPAs). Although these new types of MCOs lack the integration of the earlier MCOs, they are increasing favoured by patients, physicians and payers. Many specialists are pursuing greater technical expertise and policy hegemony to secure professional autonomy, while de-emphasizing primary care activities and administrative tasks (Arnetz, 2001). Unable to adopt similar tactics, the less specialized physicians, in particular general practitioners, are being pressured to take on a greater number of patients while reducing the intensity of the services they deliver (Kuttner, 1999).

The potential for the further de-skilling of primary care physicians is seen with the recent emergence of the *hospitalists*, a new group of specialists meant to take over

responsibility from the primary physician once the patient enters the hospital (Schroeder & Shapiro, 1999; Noyes & Healy, 1999; Showstack et al., 1999; McConagby, 1998; Morasch, 1998). Under pressure to increase efficiency, many primary care physicians are now abandoning the hospital-based component of their practice.

While the hospitalist system can reduce and simplify primary physician workloads (Fernandez et al., 2000), such a model of practice is disconcerting in that it limits the participation of many physicians in activities that are intrinsically rewarding. In addition to a potentially negative impact on professional development, the further separation of the primary physician from the patient represents a threat to the continuity of patient care.

1.4 Opposing Change: The Enduring Legacy of Medical Dominance

The failure by health system managers in Canada, and elsewhere, to more fully implement appropriate changes in the work of physicians may be explained, in part, by the clinical autonomy of physicians and their ability to gain public support for their preferred orientation toward health care. Despite health care reform and the impact of external trends on the health care system, medical practices and how physicians allocate their time are for the most part left to the discretion of physicians; many of whom prefer to maintain the *status quo* (Dobson, 1997).

With the possible exception of lawyers and the clergy, physicians are unique in their ability to exercise professional autonomy and maintain almost exclusive authority over what they do. The ability of physicians to influence the system and to control their work is the logical manifestation of a historical dominance over issues relating to health

and health care, first claimed and later maintained by physicians, for more than a century.

The source of physician hegemony is contentious, but is probably due to a number of factors. Some suggest it was due to the ability of physicians to establish a perception of trustworthiness at the end of the 19th century that allowed them to establish their dominant position in health care (Coburn et al., 1983). Parsons (1951) attributed the authority and influence of physicians to a level of training that differed significantly from others by being prolonged, specialized, and theoretical. Freidson (1971) disagreed, arguing that many groups had identified themselves as professionals using these criteria, yet did not occupy the same level of prestige as physicians. Instead, Freidson (1989) felt that the professional dominance held by physicians was due primarily to their ability to control other occupations through licensing and restrictive regulations.

A different explanation is offered by Light and Levine (1988). They argued that cultural beliefs and deference toward those perceived as healers were fundamental sources of power, and that physicians more than any other group were able to exploit these factors to their own advantage. Another explanation for physician dominance in health care is the neo-Marxist view, which argues that authority over health care was conferred on medicine by the capitalist elites. Their purpose was to exploit the status of medicine, with its ideology of glorifying efficiency and science, as a way to justify the corporate capitalist class (Coburn et al., 1983).

Regardless of the source of medical hegemony, the result was the elimination of irregular practitioners and the exclusion of those lacking the necessary credentials. By the early part of the 20th Century, alternative practitioners, midwives and other health

professions had been outlawed or severely restricted in the scope of their medical practices (Coburn et al., 1983). "Legitimate" health practitioners, such as pharmacists and nurses, were not eliminated, but were subordinated to medical authority. In this way, medicine was able to establish a seemingly unassailable claim to clinical autonomy based on their "unique" expertise (Friedson, 1970).

By the middle of the twentieth century, physicians not only exercised dominance over other health professionals, but enjoyed considerable influence over government health policies (Stevenson et al., 1988). As a result, physicians were able to ensure that government sponsored health plans preserved the autonomy of physicians. Medical dominance also allowed physicians to create and control working conditions conducive to their own practice preferences (Globerman, 1990).

At present, medical hegemony is perceived to be in decline (Anderson, 1998). This is seen to be evident through the increased public regulation of physician practices and conduct, the control of fees, global payments, and attempts to control the number and location of physicians. Theories used to explain this decline include corporatisation, proletarianism, deprofessionalism (Calnan & Williams, 1995; Relman, 1983); and greater involvement by the state through national health insurance (Coburn et al., 1983).

While a substantial portion of their power has been demanded by, or delegated to, other health care providers, authority over health care still rests primarily with physicians (Temkin-Greener, 1983). Blumenthal and Epstein (1996) suggest that physicians no longer have the power to influence greatly the preferences of organized purchasers or other providers, yet physicians through their clinical authority can effectively delay or

prevent implementation of policies that do not reflect their preferences (Anderson, 1998).

As stated previously, medical hegemony has contributed to the persistence of problems within the health care system; problems that have been known for some time and for which remedies have been repeatedly proposed, but seldom pursued with any vigour. These problems include: the mal-distribution of physicians (Sullivan et al., 1996; Eisenberg, 1994); the under use of complementary services and providers; and the fragmented nature of health care delivery (Thompson, 2000; Leatt et al., 1996).

Medicine's control over the Canadian health care system has adversely affected the distribution of physicians. On a per capita basis, Canada is seen to have an oversupply of physicians (Evans, 1996). The situation of over supply has persisted for decades, and is generally attributed to the decision in the mid-1960s to create a number of new medical schools in anticipation of a growth in the nation's population that did not occur (Barer et al., 1989). Even as the over supply of physicians was becoming evident, the supply of physicians in smaller centres was declining as physicians increasingly congregated in larger urban centres (Colohan, 1996). A number of factors contributed to the migration of physicians away from smaller centres (Ricketts et al., 1996; Pathman et al., 1994; Rourke, 1993; Jennett; 1988; Carter, 1987), but the net effect was that Canada was left with a severe mal-distribution of physicians.

Although there has been a decline in rural populations, the demand for physicians services in smaller centres remains high. Various incentives and programs have been used to encourage physicians to move to smaller cities and towns (Gray et al., 1994; Connor et al., 1994; Stratton et al., 1991), but physicians continue to prefer larger centres.

This behaviour among physicians suggests a preference for the benefits and conditions associated with these centres (Ricketts et al., 1996; Carter, 1987; Langwell et al, 1987), as well as the ability to develop and maintain a viable practice in over-serviced areas.

With physicians concentrated in large cities, access to medical care is relatively convenient for people living in these centres. Partly the result of easy access to physicians and few financial barriers, urban patients have come to see physicians as their primary health care provider. Other health care providers, by virtue of patient preference (Gutkin, 1997), and physician dominance of the health system gateways, largely occupy supporting roles in the delivery of health services. In smaller centres, the lack of physicians has limited opportunities for other provider groups, due to the physician's mandated gatekeeper role and legally entrenched authority.

Physician behaviour continues to have a substantial effect on the functioning of the Canadian health care system, and diminished though it may be, the clinical authority of the medical profession is still significant (Hafferty & Light, 1995). This residual of the historic hegemony of the medical profession still allows physicians to successfully pursue professional and personal objectives, while largely ignoring the broader policy objectives of the health care system. As illustrated by the poor distribution of physicians, the under utilization of other health practitioners, and the fragmented mature of the health care system, the decisions made by largely autonomous physicians in pursuit of professional and personal objectives have created a number of problems for the health care system.

Despite these difficulties, the work of physicians and how they choose to allocate their time will continue, for the time being at least, to reflect the preferences of the

medical profession, regardless of external attempts to change their behaviour. Perhaps a better strategy for changing physician practices would be to create conditions within the health care system that would allow physicians to pursue their own goals and objectives in a manner that supports the objectives of the health care system. Consideration of how physicians are motivated to change behaviour and how physicians might be encouraged to pursue professional and personal objectives in a manner that is congruent with societal objectives are the subjects of the next chapter.

2 Motivation and the Work of Physicians

External incentives such as money or the threat of regulatory sanction rarely result in willing compliance or permanent change, as the individual is likely to revert to old practices once the incentive or threat is removed. Furthermore, poorly conceived incentive strategies designed to change practices may actually cause the individual to adopt or intensify counter-productive behaviours in pursuit of preferred goals and outcomes. Recognizing that the goals of physicians and the capacity to pursue these goals will often determine physician behaviour, broader health policy objectives may be best promoted by allowing physicians to achieve their personal and professional goals in a manner that supports the objectives of the health care system.

In this chapter, the focus will be on identifying the goals and objectives of Canadian physicians and the process by which physicians are motivated to obtain these goals and objectives. Various motivation theories will be discussed including a number of content and process theories. Particular attention will be given to equity theory and the contributions and rewards of physicians. The effect of perceived inequity due to an imbalance between inputs and outcomes will be reviewed, with attention to distress created by inequity and strategies adopted by groups and individuals to alleviate this distress. The chapter concludes with a discussion of the relationships between equity, distress and the wish to reallocate time among physicians.

2.1 Pursuing Goals and Objectives: Conflict or Convergence?

The primary goal of the Canadian health care system is to provide equitable access to quality health care services in a cost-effective manner (Health Canada, 1999). Toward that end, considerable attention has been given to encouraging those involved in the delivery of health care services to meet these goals. Getting physicians to pursue these objectives is particularly important given their central role and clinical authority. However, strategies used to encourage physicians to practice in a manner that is supportive of broader health policy objectives have only resulted in limited, often temporary changes in clinical practices.

One reason for the limited success of these strategies is that they generally fail to reflect the personal and professional goals of physicians. The professional goals of physicians include the successful treatment of disease, interesting work, status, and a relatively high income (Arnetz, 2001; Epstein et al., 1993; Williamson et al, 1993). Personal goals will vary, but are likely to include: time for themselves and their families; and the pursuit of interests and other goals unrelated to professional objectives (Wheeler et al., 1990; Tait & Platt, 1995). Meeting health system objectives often requires the physician to take on new duties at the expense of both professional (treating disease, income) and personal (personal and family time) goals (Vinson et al., 1996).

The internal motivation of physicians to achieve their professional and personal goals is rarely considered or incorporated into strategies designed to promote health system goals. Instead, the focus tends to be on external incentives, both positive and negative, and a reliance on the physician's sense of obligation to gain physician

compliance (Wheeler et al, 1990).

Although physicians can be induced to change behaviour through the use of external stimuli, if the external incentives offered by the health care system are not conducive to their needs, physicians will eventually return to practices and behaviours seen to promote their own goals and objectives. The challenge for policy makers and health system administrators, therefore, is to support physicians in achieving their professional and personal goals in a way that also promotes the objectives of the health care system in the long term.

2.2 Motivation and Motivation Theories

For a change in behaviour to occur, the physician must be motivated to make the change. Motivation can be defined as the force that compels the individual or group to adopt a specific behaviour, or behaviours, in pursuit of a particular goal or goals (Wong et al, 1983). Several theories have been advanced to explain the relationship between motivation and behaviours and are divided into either content or process theories (Longest, 1996). Content theories focus on the things that actually motivate people, and seek to identify the factors that are likely to affect behaviour. Major content theories of motivation include: Maslow's Hierarchy of Needs; Alderfer's ERG Theory; and Herzberg's Two-factor Theory. Process theories of motivation explain how changes in behaviour designed to maintain or obtain preferred outcomes are initiated. Process theories include Vroom's Expectancy Theory and Adam's Equity Theory.

Content Theories: Maslow (1970) argued that individuals are motivated by the desire to fulfill needs, and that there is a progression in the satisfaction of these needs (Maslow, 1970). Maslow's Hierarchy of Needs identified five layers of needs (Hagerty, 1999), ranging from the lower needs, including: biological needs, such as food and shelter; safety needs, such as security; and social needs, such as friendship and a sense of belonging, to the higher level needs, including: esteem needs, such as achievement and recognition of that achievement; and self-actualization needs, such as creativity, self-expression, integrity and self-fulfilment. Failure to fulfill a specific need causes frustration and fixation on that need until it is met (Sirgy, 1986). Lower order needs must be met before higher order needs can be addressed (Maslow, 1970).

Although the theory has not been validated empirically, and the incremental approach toward need fulfilment is somewhat simplistic, Maslow's Hierarchy of Needs is important in providing a conceptual framework on which to build more sophisticated theories about needs and how they affect human behaviour (Longest, 1996).

Alderfer's ERG Theory builds on the work of Maslow. Alderfer begins by reducing Maslow's hierarchy of needs from five to three: existence, relatedness and growth. Like Maslow, Alderfer argues that once existence and relatedness needs are met they become less important, while meeting growth needs become increasing important (Alderfer, 1989). Alderfer advances Maslow's theory by suggesting that following any initial success in meeting growth needs, an individual is motivated to seek even more growth, or higher levels of achievement (Longest, 1996). In effect, initial growth experiences act as a kind of positive feedback, with each growth experience motivating

the individual to seek the next growth opportunity. This suggests that physicians, by virtue of the growth associated with becoming physicians, may be particularly inclined to seek additional opportunities to grow and develop professionally.

Herzberg's Two-Factor Theory takes a somewhat different approach to motivation. This theory argues there are *satisfiers* which motivate the individual, but that there are also *hygiene* factors which act as de-motivators (Herzberg, 1987; Silver, 1987). Satisfiers include such things as: achievement; recognition; the work itself; possibility for growth; and responsibility. Hygiene factors include: interpersonal relationships; salary; job security; working conditions; and status (Knoop, 1994). Satisfiers arise from: the variety found in one's work; the ability to complete whole tasks; having work that is seen as relevant; autonomy to carry out a task; and getting feedback on performance. The implication for the health care system is that, at a time when changes in physician behaviour and patterns of practice are being actively pursued, hygiene factors must be addressed. However, in order to motivate physicians to actively pursue greater efficiency and enhance the quality of care, satisfiers must also be present.

Process Theories: Vroom's value/expectancy theory is based on the following propositions: 1) individuals assign value to outcomes and as a result have preferences among outcomes; and 2) the extent to which they believe their own action will contribute to the desired outcome is important (Vroom, 1964). That is to say, in determining what action they will take, the more that individuals value a particular outcome and the more they anticipate that the outcome depends on their actions, the more they will be motivated to act (Troyer & Younts, 1997; Wong et al, 1983).

People are driven by their needs, but their choice over what they will and will not do to fulfill their needs is based on: 1) the expectation that the desired change is achievable (expectancy); 2) that the change will produced the desired effect (instrumentality); and 3) the degree that the effect is valued by the individual (valence):

Motivation = Expectancy* x *Instrumentality* x *Valence

Put another way, expectancy theory hypothesizes that good performance is a function of motivation and ability (Vroom, 1964). Motivation in turn is a function of performance goals and the 'expectancy' that one's efforts will result in attainment of these goals (Oliver, 1974). Therefore, to be motivated to change behaviour, the individual must have the expectation that a change is possible and believe that a change will have the predicted effect. In addition, the predicted effect must be valued by the individual.

One must consider the implications of expectancy theory for physicians. Physicians have traditionally occupied a position of authority and trust within our society, doing work seen to be important, and receiving a high level of financial rewards for that work. Their desire and ability to maintain these outcomes represents a substantial obstacle to meaningful health system reform. At the same time, the much needed restructuring of health care and the redefining of roles diminishes the ability of physicians to achieve their preferred goals and objectives, further de-motivating physicians to participate actively in health reform. Health policy initiatives that do not meet, or which ignore the expectations and preferences of physicians are more likely to be resisted or not acted upon.

2.3 Perceptions of Equity and the Work of Physicians

As an extension of expectancy theory, equity theory argues that individuals will assess the equitable distribution of the desired outcomes, rather than seeking to maximize their own beneficial outcomes, as espoused in expectancy theory. The extent to which maximization strategies are employed will be based, in large measure, on the desire to achieve a fair exchange. Equity theory recognizes that people are interested in distributive justice, or getting what they believe they deserve for contributions that benefit society, an organization, or another individual. The perceived link between the value of their own performance and the rewards they receive is fundamental to their sense of fairness (Longest, 1996).

The delivery and receiving of health care constitutes an important relationship in which each party is expected to act in a reciprocal manner. This reciprocity is not limited to economic considerations in exchange for services rendered, but can also include social rewards such as appreciation, respect and acknowledgement of the value of the benefits received by all those participating in the exchange (Arnetz, 2001). Rooted in the concepts of distributive justice and social exchange (Blau, 1994), equity theory offers a strong theoretical basis from which to predict physician behaviour in the context of the changing health care environment, and the effect of these changes on the contributions of physicians and the benefits they receive. In this study, equity theory is used to assess the importance of a fair exchange as a motivator for physicians to change the time they wish to allocate to various professional activities, and to identify more precisely those factors contributing to the perception of a fair exchange.

2.4 The Underpinnings of Equity Theory

Equity theory is traced to the work of Adams in the early 1960s (Miles, 1987), as well as work carried out by Homans (1961) on organizational behaviour, and Festinger's theory of cognitive dissonance (1954). Equity theory as proposed by Adams (1963, 1965) suggests that individuals and groups will only be satisfied with the distribution of rewards (outcomes) if they are proportional to the contributions (inputs) of the individual or group (Lane & Messe, 1972). In situations where an imbalance between inputs and outcomes is perceived, the individual will experience inequity. Perceptions of inequity will lead, in turn, to distress. The distressed individual is highly motivated to seek a method by which to restore equity, and thus reduce distress (Witt & Nye, 1992).

Equity can be defined as that which is fair, impartial, or related to principles of distributive justice. Equity can be further defined as either horizontal equity or vertical equity. Horizontal equity can be described as the equal treatment of equals, and fairness will only be perceived when individuals are treated equally regardless of their position with respect to some other characteristic (Birch & Abelson, 1993).

In contemplating vertical equity, Irwin (1995) observed that financial rewards are often structured to reflect economic and social obligations; that those with greater social responsibility are frequently provided greater rewards for a comparable level of productivity. Equity is preserved because those who do more for society also receive more rewards. The lack of equality of benefit is accepted, in part, because this inequality is perceived to be just, based on differing levels of contribution (Irwin, 1995). In this study, equity is based on vertical equity (henceforth referred to as equity).

2.5 Inputs and Outcomes

In the end, the concept of equity cannot be defined in terms of a concrete truth (Birch & Abelson, 1993). Equity theory operates from the premise that it is the subjective rather than the objective evaluation of inputs and rewards that determines whether one feels fairly or unfairly treated (Major and Testa; 1989).

However, from a policy perspective it is important to specify precisely the factors required to secure equity in order to determine when it has been achieved. Key to measuring and evaluating perceptions of equity is the identification of relevant inputs and outcomes upon which individual judgements of equity are determined. However, it is often difficult to determine which parts of the exchange will be viewed by the individual as an input and which will be viewed as an outcome (Huseman et al., 1987; Weick, 1966; Pritchard, 1969).

A problem for early researchers was determining *a priori* whether a particular characteristic should be viewed as an input or as an outcome (Lawler & O'Gara, 1967). Tornow (1971) observed that individuals differed in their tendency to classify ambiguous elements as either inputs or outcomes. Consequently, it is generally understood that "equity is in the eye of the beholder", and as such, it is often not practical to objectively measure the quantity of a given factor or to arbitrarily assign the factor as either an input or an outcome (Huseman et al., 1987).

Despite these difficulties, some factors have been identified as important contributors to perceptions of equity, either as an input or as an outcome. Inputs generally include such factors as technical skill, time, physical and mental effort, risk,

dedication and judgement (Feldman et al., 1994), while outcomes or rewards tend to include factors such as the rate of pay, promotions, higher status, and increased self-esteem (Longest, 1996).

The "perceptions of effort-reward fairness" scale developed by Van Yperen (Jannsen, 2000) incorporated a number of input factors in a series of six items. These included: 1) work in exchange for outcomes; 2) time in exchange for appreciation; 3) commitment in exchange for rewards; 4) the proportionality of rewards; 5) effort (energy) for outcomes; and 6) level of unfair treatment on the job. While producing high reliability as a summative scale (Cronbach's alpha = 0.90), the general nature of the outcomes used by VanYperen makes it difficult to identify the relative importance of the different types of rewards associated with the medical practice.

Inherent in the work of health care professionals are two types of rewards: intrinsic and extrinsic. Intrinsic rewards are intangible and relate to gratification and security obtained through the application and advance of professional knowledge. Extrinsic refers to rewards obtained from others as the result of professional activity. Extrinsic rewards can be further classified by source (professional or community) and by type (intangible and tangible). An example of an intangible extrinsic reward would be prestige or status, while monetary remuneration is considered a tangible extrinsic reward (Ben-Sira, 1986).

Tangible extrinsic rewards (such as money) maintain a key position in the evaluation of equity. The level of pay received for services provided was the fundamental relationship upon which equity theory was established, and the principal focus of early

research (Clark, 1958; Adams, 1963; Patchen, 1961; Lawler & O'Gara, 1967; Andrews, 1967). In medicine, despite comparatively high levels of income, perceived inequities in compensation do exist, particularly between cognitive and procedural specialties (Katz et al., 1997). While exacerbated by recent budgetary shortfalls, these economic inequities are created and maintained in large part by the profession itself and its procedural orientation toward health care. Provincial medical associations are largely responsible for assigning reimbursement rates to the various services they provide, yet are seemingly unable to effectively deal with the situation (Wright, 1996).

Lawler and O'Gara (1967) identified a number of non-monetary rewards including: finding the work more interesting; more important; less complex; and less challenging. The extent to which a task is interesting was found to moderate the degree that individuals responded to a situation of monetary underpayment or overpayment (Andrews, 1967). Interestingly, Lawler et al. (1968) found that recognition by others was a negative outcome among overpaid individuals.

While the literature identifies a number of factors that might be considered when paying physicians (Feldham et al., 1994; Hsiao et al, 1988), what is less well known is the relative importance of these factors among different physician groups and how these factors might be related to perceptions of equity (Dobson & Lepnurm, 2000).

Walster and Walster (1975) suggested that individuals will often seek alternatives to money in order to secure greater rewards, and that these choices may differ by gender. In the past, men were seen to be more likely to view succeeding at a challenging task as an important outcome, while women were more likely to view succeeding at affiliation

goals as an important outcome. Nieva and Gutek (1981) found that women tended to value pay and promotion less, placing more value on interpersonal relationships.

In a study of equity among primary physicians, Ben-Sira (1986) found that they often had to deal with trivial activities. As a result, it was difficult to derive intrinsic rewards from the work itself due to routine repetition of simple complaints offering no real challenge. Ben-Sira (1986) also found that primary physicians were more likely to experience feelings of professional stagnation, and that they often viewed their position as inferior within the medical community. The result was a perceived lack of opportunity to increase intangible rewards, both intrinsic and extrinsic.

A lack of opportunity to secure intangible rewards among general practitioners suggests greater importance may be placed on tangible rewards (money), with less consideration of the reallocation of time as a means by which to improve equity. Dobson (1997) suggested that family physicians may differ from other specialties in their perceptions of the equity of income as it relates to their willingness to change their patterns of practice. Therefore, it is conceivable that the specific types of rewards sought by physicians may vary across groups, and that rewards may be associated with specific efforts, inputs and behaviours, thus affecting the mix of inputs provided.

2.6 The Nature of the Comparison Process

In developing equity theory, Adams (1965) proposed that the comparison of one's own input/outcome ratios with other individuals is the principal mechanism by which individuals determine their level of equity. If these ratios are perceived to be different,

the individual experiences inequity. Positive equity results when the person's ratio of outcomes to inputs is perceived as better than those with whom the individual is making comparison; negative equity occurs when the person's ratio is perceived as worse than the other person(s).

Equity theorists such as Pritchard (1969) and Messe and Watts (1983) argued that individuals make internal evaluations as well as comparisons with others. Weick and Nesset (1968) found that inequity arose from a comparison of one's own input/outcome ratio or from a comparison with the equity ratios of others, although individuals were more bothered by inequitable comparisons with others than between their own inputs and outcomes. Dornstein (1989) found that fairness judgements regarding remuneration were based on one or more frames of references including: comparison of others, comparison against prevalent norms of exchange, as well as based on need or individual contribution.

More recent equity theorists (Jasso, 1980, Markovsky, 1985; Molm et al, 1993) have moved away from an exchange framework based on individual comparison, toward the concept of distributive justice. Molm et al (1993) argue that an allocative approach, rather than the exchange approach, is more appropriate in situations where there is a distribution of rewards or benefits across a number of individuals. In such situations, perceptions of inequity increase as actual rewards depart from what is judged to be fair by the affected individual in relation to the comparison "other" rather than those participating directly in an exchange (Molm et al, 1994).

In the current study, both exchange and allocation measures of equity were used, and value affixed to both inputs and rewards was based on the perception of the

physicians surveyed. While it might be argued that physicians are not necessarily qualified to assess the value of their contributions, ignoring their perspective would make the task of comparing inputs and outcomes extremely difficult, if not impossible. Furthermore, physicians continue to have great influence over many components of the health care system, and will continue to exercise significant influence for the foreseeable future. Therefore, changes in the behaviour or activities of physicians due to perceived inequities have the potential to adversely impact the health care system in a substantial way. Essential to minimizing the potential for adverse consequences is determining the importance of various inputs and outcomes based on the physicians' own perspective of what is considered fair.

In addition to distributive equity and the comparison of inputs and outcomes, the perception of equity is also affected by the manner in which the distribution of rewards is determined (Lind & Tyler, 1988; Leventhal et al., 1980; Thibaut & Walker, 1975). In other words, *how* decisions are made rather than *what* is decided is also important (Greenberg, 1990). Process equity is achieved when the methods used to assign rewards are perceived to be open and objective, and are associated with the attitudes held by individuals about relevant institutions or authorities.

The fairness of the process used to determine pay raises, for example, is seen to contribute to factors such as organizational commitment and trust in supervision (Tyler et al., 1985). Process equity is not expected to relate directly to time allocation preferences, which represent strategies designed to change outcomes (Tyler, 1990). However, due to its potential contribution to distributive equity (Greenberg, 1990), process equity will be

assessed concurrently, and questions relating to process equity are included in the study.

2.7 Distress: Responding to Perceptions of Inequity

In responding to inequity, Walster, Berscheid and Walster (1973) proposed four interlocking propositions to explain behaviour relating to inputs and outcomes (Figure 3). Based on these propositions, Hatfield (nee Walster) and Sprecher (1984) argued that those experiencing inequity will experience distress and respond by either restoring actual equity through behavioural change, or by restoring psychological equity through a change in the value assigned to existing inputs and/or outcomes.

Proposition I: Individuals will try to maximize their outcomes

Proposition IIA: Groups will seek to maximize the collective reward by evolving accepted systems for equitably apportioning resources among members.
Proposition IIB: Groups will generally reward members who treat others equitably and punish those who don't.

Proposition III: Individuals become distressed in inequitable situations

Proposition IV: Individuals in inequitable situations will attempt to restore equity. The greater the inequity, the harder they will try to restore equity.

Figure 3: Equity Propositions (Source: Hatfield & Sprecher, 1984)

The distress associated with inequity is distinctly different from stress associated with the medical practice, which has been studied extensively by various researchers concerned with the physical and psychological well-being of physicians. While the detrimental effects of external stressors on the health of physicians and other groups are

important, they are not generally looked upon as a source of motivation. Indeed, it is the unwillingness or inability to change the work environment that is often associated with more harmful levels of stress (Karasek, 1979).

Distress on the other hand, is a manifestation of the individual's concern that the current situation or exchange is inappropriate. Distress is linked to stress in that unresolved distress due to an inability to restore equilibrium can serve as a source of stress, leading to physician burnout (Bakker et al., 2000). More importantly, at least in the context of physicians and others exercising control over their working conditions and levels of productivity, the distress that arises from perceptions of inequity serves to motivate the individual to modify their behaviour as a way to reduce a perceived inequity (Hatfield & Sprecher, 1984).

Clark (1965) showed that underpayment can lead to feelings of inequity among workers resulting in reduced productivity (lower inputs). Lawler and O'Gara (1967) found that individuals perceiving themselves to be underpaid attempted to restore equity by increasing other types of outcomes. In this case, those perceiving a low piece-rate tended to increase the number of units produced while reducing the effort and attention expended on each unit. More recently, Perry (1992) found that workers who consider themselves to be under-rewarded financially are more likely to strike, file grievances, or withdraw from the workplace.

Over-rewarded individuals may also perceive a system to be unjust, but are generally less likely to feel responsible for the injustice or attempt to change their inputs and outputs to restore equity. If over-rewarded individuals do experience distress, they

are more likely to adopt a psychological rather than a behavioural strategy to restore balance in the exchange. As a result, perceptions of inequity due to being over-rewarded are less likely to cause the individual to alter the actual components of the exchange.

Hatfield and Sprecher (1984) also suggested that equity theory provides a framework for understanding business and social relationships in organizations. The level of equity experienced by the individual has a significant impact on the person's willingness to stay in a situation or organization. When pay is equitable, workers are more likely to cooperate with one another for their mutual benefit. However, when pay is perceived as inequitable, workers may choose not to cooperate and opt instead for individually defined tasks, even if this results in reduced levels of financial compensation for the individual.

While some financial penalty may be endured to secure equity, it should be understood that there are limits to this strategy, and there will be a threshold income perceived as the minimum. In this way, the necessity of a fair exchange is subordinate to an acceptable level of rewards. This can be illustrated by the concepts of income targeting and supplier-induced demand; concepts that are often attributed to physicians when discussing remuneration issues (Mitchell et al., 2000; Chaix-Couturier et al., 2000; Bernstein, 1998; Rizzo & Blumenthal, 1994; Krasnik et al., 1990, Rice & Labelle, 1989).

Provincial governments have often attempted to control medical costs by freezing or reducing the amount of reimbursement provided for individual procedures. Physicians have generally responded by increasing the number of procedures they perform or by favouring procedures that provide greater reimbursement (Mitchell et al., 2000; Chan et

al, 1998a; Barer et al., 1988).

While some physicians pursue a strategy of income maximization, the majority only expand their patient care activity to the extent required to achieve a particular income level (Chan, 1998b; Krasnik et al., 1990). However, these "income neutral" practices can result in a shift in the services offered that is independent of the medical conditions presented to physicians by patients (Barer et al., 1988). Therefore, strategies used by physicians to restore or improve income have the potential to adversely affect clinical practice, as well as the patient-physician relationship (Labelle et al., 1994).

2.8 Inequity and Distress Among Physicians

Any objective assessment of the health care system reveals greater monetary rewards for physicians compared to other health care providers. Indeed, physicians as a group constitute one of the highest paid groups of workers in Canada (Colohan, 1996; Iglehart, 1989). The issue to be addressed, however, is not one of equality, but rather of relative fairness. Despite continued high status and high levels of income relative to the general population, any decline in "rewards" without a corresponding decline in effort can be expected to result in a sense of "relative deprivation" (Globerman, 1990).

Increasing emphasis on cost control (Wolfe, 1991), changing public expectations and challenges to medical autonomy from other health care providers (Coburn et al., 1983), and the shifting in health policy toward health promotion (Williams et al., 1995) are changing the relationship between physicians and other health care stakeholders, including: patients, nurses, allied health care professions, health care organizations, and

third-party payers. In these evolving relationships, the activities expected from physicians and the corresponding rewards received often contrast with physicians' own perception of the content of their work and its inherent value.

In the past, the imbalance in the rewards given to physicians compared to other groups was justified because it was perceived to be based on the higher levels of expertise and social benefit provided by physicians (Irwin, 1995). Today, other health providers and society in general are less inclined to accept the higher rewards received by physicians as a fair reflection of their contribution. These changing perceptions represent a source of conflict between physicians and other health care stakeholders. As a result, physicians are likely to experience a shift in the balance between the efforts they expend in the delivery of health care services and extrinsic rewards that they are being offered. The decline in status and income associated with the increasing influence of other groups can be expected to lead to perceptions of inequity among physicians (Maynard & Williams, 1984).

Equity theory suggests that any perceived imbalance in an exchange relationship will cause distress for one or more of those participating in the exchange (Austin, 1980; Walster et al., 1973), particularly for those experiencing a net loss of benefit (Figure 4). To minimize distress, physicians may seek to restore equity by changing the value attached to the exchange (psychological response) or by modifying the components of the exchange (behavioural response) (Hatfield & Sprecher, 1984).

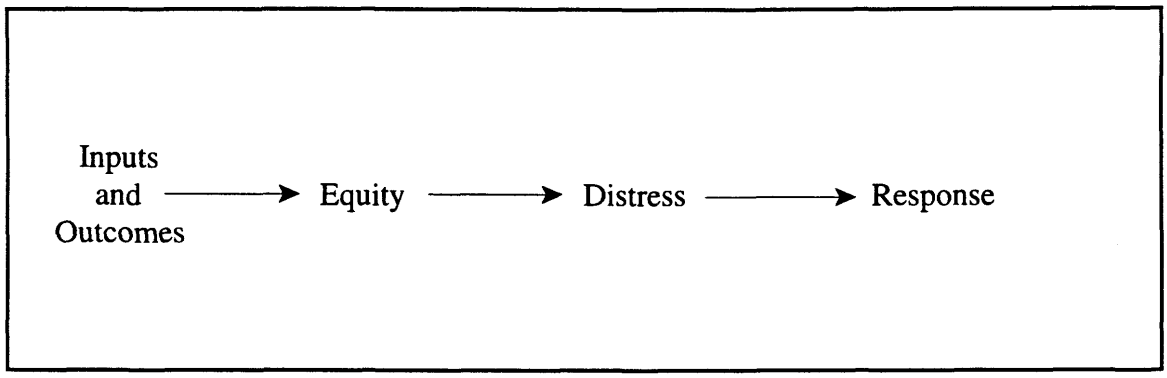

Figure 4: Equity Response Pathway

Early empirical evidence suggested that within a piece-rate method of remuneration (of which the medical fee-for-service method of payment is a particularly lucrative example), workers who are underpaid will be inclined to produce more at lower quality, and that those who are overpaid will produce less of higher quality (Pritchard, 1969). However, professional training and a sense of duty will serve to diminish the inclination of physicians to adopt such strategies in pursuit of equity; therefore, they must look for other ways to increase rewards or reduce input costs.

Bakker, Van Dierendonck and their associates found that feelings of inequity regarding the nature of the patient-physician relationship led to increased distress and greater emotional exhaustion among general practitioners (Bakker et al., 2000; Van Dieredonck et al.,1996 & 1994). These authors argued that, due to their professional obligations to their patients, physicians were limited in the strategies they could employ to restore equity, and tended to adopt attitudinal changes, including callousness, cynicism or impersonal attitudes towards their patients. Invariably, these attitudinal changes led to a deterioration of the patient-physician relationship, eventually manifesting itself in even higher levels of distress and burnout (Bakker et al., 2000).

The response of physicians to inequity in their relationship with other health care stakeholders, however, is not expected to be the same as their response to inequity in their relationship with patients. For example, health care organizations and physicians have a relationship that is much more reflective of the traditional understanding of an exchange relationship; in return for remuneration and other less tangible rewards the physician agrees to provide specific, quantifiable services to the institution and its clients.

Although physicians tend to subscribe to the notion of being economically and clinically independent practitioners, in many ways, their relationship with the health care system is similar to an employer-employee relationship. As a result, a sense of obligation on the part of the physician is more likely to be contingent on the quality of an economically-based relationship. When the exchange is perceived as unequal, the physician is less likely to continue due to a socially-derived sense of duty or obligation (Grimes, 1992). When inequity is seen to exist, physicians can be expected to seek restoration of equity through changes in income or workplace practices and conditions. In an era of constrained health budgets and salary caps, the opportunity for physicians to increase their economic benefits is somewhat limited; therefore, physicians may be more inclined to reduce or withdraw specific services, reduce their total hours of work, or otherwise change their patterns of practice.

2.9 Equity, Distress and the Wish to Reallocate Time

Physicians have considerable scope when determining their working hours and the activities they carry out (Camasso & Camasso, 1994; Kristiansen & Mooney, 1993). The

work of physicians is diverse, however, and includes various patient and non-patient activities (Weisman & Teitelbaum, 1987, Morriosn, 2000). The very complexity of medical work might make it difficult for a physician to accurately identify the time spent on specific tasks, or to change time allocated to tasks in any directed manner. However, research has demonstrated that physicians do have the capacity to accurately identify the time they spend on various activities (Hsiao et al., 1988), as well as mental effort and judgment, technical skill and physical effort (Feldham et al., 1994). Furthermore, Feldham et al. (1994) found that physicians could accurately identify the work components such that there was 85% agreement with total physician work.

Physicians make conscious decisions on how they allocate their time between caring for patients, keeping up with the literature, being involved in teaching and research, participating in committees, and attending to the paperwork associated with their practice. Therefore, adopting a strategy of time reallocation would appear to be feasible for physicians seeking to restore equity, both from the point of view that they possess the ability to change to content of their work and that they are aware of their current practices. If rewards appear to be decreasing or practice demands and costs increasing, physicians may seek to improve the balance by increasing intrinsic rewards through the reallocation of their time between activities. In deciding how to allocate their time, the physician will take into account the needs of their patients. The physician will also consider personal interests in terms of income, leisure, workload and preferences for other tasks (Wheeler et al., 1990; Tait & Platt, 1995; Vinson et al., 1996).

The physician's decision to abandon or reduce a specific activity may be due to: a poor rate of pay; poor working conditions; reduced opportunity to use diagnostic skills; reduced patient contact; reduced clinical autonomy due to restrictive protocols; or the tedium of a repetitive task (Grimes, 1992). For example, in examining the reason for the declining interest in internal medicine over a two decade period, Rosman et al (1989) found contributing factors to include an increased number of tests, consultations, admissions and discharges, all leading to vast increases in clerical responsibilities and the reduction of time available for patients.

Diminished autonomy and weaker physician-patient relationships due to greater shared decision-making also contribute to the wish to reallocate time. Factors such as long hours, uncertainty in decision-making, lack of support, and lower rates of pay are not negligible, but they are less important if such factors have been long associated with an activity in the past and remain relatively unchanged (Hardison, 1986).

It has been suggested that the activities carried out by physicians provide an opportunity to contribute and perform well, to be rewarded and esteemed, and to belong to a group (Peter & Siegrist,1997). The benefits of any activity are contingent, however, on reciprocity. A lack of reciprocity between costs and gains creates distress, with a propensity to cause negative physical, psychological and emotional autonomic reactions.

Continued participation in an activity can occur in the face of poor or declining rewards if the task is perceived as vital. Grimes (1992) uses the example of the older clinician who continues to provide abortion services because of their awareness of the morbidity and mortality suffered by women before abortion was legalized. Among

younger physicians, a lack of awareness of these factors increases the likelihood that negative incentives will cause them to abandon or avoid the procedure.

Avoidance or withdrawal behaviour also occurs with non-patient centred activities. In an examination of the reasons why physicians failed to attend a course in which they initially expressed interest, Pitts and Vincent (1994) concluded the reasons were: the time required to attend the event; and existing family and medical practice demands.

From a societal perspective, the ability of physicians to determine the nature and intensity of their work is worrisome if the activities valued by the health care system are seen by the physicians as over-burdensome, less important or unrewarding. While the decision to reallocate time may be beneficial to the physician in terms of restored equity and reduced distress, decisions to reallocate time may adversely impact on the utilization, quality and cost of the health care system.

Many of the tasks performed by physicians require the skills of a qualified medical practitioner, but a number of patient and non-patient centred procedures, tasks, and activities can be delivered as effectively, and more efficiently by non-medical providers (Rachlis, 1995). While important or even necessary from the perspective of the physician, carrying out such tasks may represent the inappropriate utilization of a valuable resource from the perspective of society or the health care system.

In reallocating time to restore equity, one must be concerned about the choices physicians are likely to make, as well as their ability to initiate change. Lennon and Rosenfield (1994) contend that the ability to abandon an existing exchange relationship

for a more favourable exchange has the effect of raising expectations and the standard by which the existing exchange of inputs and outcomes is judged to be fair. The mobility of health professionals, particularly physicians, suggests that they will have less tolerance for an objectively poorer exchange as compared to other, less mobile workers. Inability to maintain or restore equity to an existing exchange is likely to increase the likelihood of withdrawal from the exchange. To prevent this situation, physicians should be encouraged through policy and managerial support to adopt appropriate models of care. Such a transition would be beneficial for physicians and for the health care system.

In summary, physicians are aware of how they allocate their time, they know that it is a precious resource, and that their time allocation decisions affect both health system goals and their own professional and personal goals. By shifting time allotments between activities it may be possible to improve the actual rewards received from the exchange without diminishing the total value of the services provided to the health care system (Dobson & Lepnurm, 2000; Linn et al., 1985). However, if the strategies adopted to reallocate time are not beneficial for society or the health care system, policy makers will need to identify other means by which to maintain equity that support a more appropriate allocation of the physician's time.

3 Practice Conditions and the Work of Physicians

Along with the recognition that the health care system and the physician's role are in need of substantial reform, there is considerable evidence that the manner in which most physicians organize their medical practice is not the best for ensuring the efficient delivery of quality care (Manning, 1999; Felt-Lisk et al., 1999; Marriott & Mable, 1998; Lepnurm, 1995; Angus & Manga, 1990; Shillington, 1983). Despite the benefits of an integrated model of health care, most physicians continue to practice in physician-specific or physician-dominated practice groups with remuneration based on fee-for-service (Hutchison et al., 2001).

To this point, it has been argued that changes in society and in the health care system are likely to affect physicians, both in terms of the demands placed on them and the rewards they can expect to receive. However, health reform and other changes in the health care environment have not fundamentally changed the manner in which physicians work within the system, nor the manner in which they organize their practices (Hutchinson et al., 2001). Most physicians work in solo practice or in practice groups that focus on treating symptomatic patients, while largely ignoring more proactive approaches to health care and more integrated models of health care delivery. At the same time, the changing health care environment has meant that more effort is required by physicians to access resources for their patients and to maintain their own incomes.

Differences in the demands and rewards associated with a particular practice setting can be expected to effect perceptions of equity. In turn, the distress associated with inequity is expected to affect physician behaviour (the wish to reallocate their time). The degree to which practice conditions affect the *equity-distress-wish to reallocate time pathway* is the principal focus of this chapter. The extent to which relevant practice conditions are determined by the environment and by the preferences of individual physicians will also be considered.

3.1 Practice Conditions: An Organizational Theory Perspective

Physicians play a central role within the Canadian health care system and for any substantial change to occur in the system, or even to allow it to function more effectively and efficiently, changes will have to occur to how physicians organize themselves and carry out their duties. Organizational theories, such as: contingency (Donaldson, 1997), resource-dependence (Pfeffer and Salancik, 1978), institutional (Meyer & Rowan, 1977), and strategic choice (Childs, 1997), suggest physicians will eventually adopt new practices and behaviours to ensure quality care for their patients and to secure appropriate rewards for themselves. In the meantime, as the push for system-wide reform increases, delays in adopting appropriate organizational designs and practices are likely to result in an increasingly inefficient and ineffective health care system, in which physicians perceive greater inequity and experience greater distress as they struggle to maintain quality care.

Contingency theory asserts that there is a "best fit" between the organization and the environment, and that a proper fit will lead to improved performance and increased organizational viability (Donaldson, 1987). Over time, the practice models which closely fit their environmental constraints will thrive and less viable models will eventually disappear. As a result, one is more likely to find a particular organizational design within a specific type of practice environment (Miller, 1981). Where variance in organizational design persists, it is explained by slack, or liberality, within the environment (Donaldson, 1987). Liberality refers to a lack of an imperative to perform in an efficient and effective manner, and is most commonly attributed to a lack of competition or low performance expectations within a particular environment.

Historically, the medical profession possessed a great deal of slack due to the monopolistic control enjoyed by physicians and relatively unrestricted reimbursement schemes. Due to their medical authority and clinical autonomy, medical practitioners were able to ignore the effect of poor fit on performance. However, as health spending becomes more constrained, and as physicians come under greater scrutiny from other stakeholders such as patients and third-party payers, contingency theory would predict that the ability of physicians and their practice groups to maintain or to adopt less efficient and/or less effective practice models will decrease. Eventually, physicians will be required to change how they organize themselves. Unfortunately, due to their current ability to resist or delay these changes, the economic and emotional costs may be higher and the transition to more appropriate practice models may take longer than would otherwise be necessary.

Resource dependence theory explains changes in organizational design and practices as a function of dependence on others for resources (Pfeffer & Salancik, 1978). The ability of the physician or the medical practice group to determine its own organizational structures and practices is constrained by the ability to influence the environment in which the individual or group operates (Zakus, 1998).

While suggesting physicians, or at least the medical profession, have the capacity to influence their environment, resource dependence theory ultimately expects organizational structures and practices to reflect the expectations of those in control of essential resources. As a result, individual physicians or their representative professional bodies will seek to diminish the influence of other groups, allowing physicians to exercise more control in support of their own objectives (Aldrich, 1976).

Evidence of this behaviour is seen in the almost daily warnings coming from the medical profession about the state of health care; warnings that usually conclude that the salvation of the system will only occur when control is rested from the bureaucrats and administrators, and given back to patients and their advocate (the physician). Using such tactics, the medical profession has been quite effective in maintaining the *status quo.* For, despite overwhelming evidence of the need to change the system and how they organize themselves, physicians have been able to resist or delay substantial changes through their political and cultural influence.

Institutional theory, on the other hand, suggests the structure of an organization is merely a reflection of the larger social institution in which the organization exists (Meyer & Rowan, 1977; Tolbert & Zucker, 1983; Scott, 1987). The success and survival of the

organization is linked to compliance with, and is a reflection of, the larger institution rather than the performance of the organization (Meyer & Rowan, 1977).

The imperative of the physician or physician organization, therefore, is to successfully reflect the values and assumptions of the larger institution. Adherence to an institutional orthodoxy is maintained even at the sacrifice of effectiveness or efficiency. New practices are only adopted gradually, and stagnation or abandonment of an innovative practice will occur if it cannot be accommodated within the existing institutional framework (Tolbert & Zucker, 1983). This perspective is somewhat more benign than resource dependence theory in attributing importance to the actions of physicians. Professional groups are portrayed as cautiously reacting to changes in the institutional environment rather than actively seeking to bringing these changes about.

Deterministic organizational theories such as contingency theory, resource dependence theory, and institutional theory provide varying perspectives on the relationship between the practice environment and decisions made by those working in that environment. However, each suggests that changes in practices, such as the reallocating time among professional activities, if based on personal preferences, are unsustainable if they fail to reflect the realities of the external environment. In predicting the contribution of practice conditions to equity and the wish to reallocate time, each theory suggests different degrees of association.

From a contingency theory perspective (Pugh et al, 1969; Drazen & Van de Ven, 1985; Donaldson, 1987), environmental and organizational factors represent the practice conditions under which the physician must function to achieve good performance

(Donaldson, 1997). As requisites to the activities carried out by the physicians, some practice conditions may be viewed as necessary for the exchange of services (inputs) and benefits (outcomes), and should not substantially affect distributive equity perceptions. The physician may not like the practice conditions, but accepts their necessity, given the demands of the practice environment. Alternatively, practice conditions, especially external environmental characteristics, may simply be seen as beyond the physician's ability to control. As such, the physician may seek to change the value placed on these factors (a psychological restoration of equity) in order to diminish the impact of objectively unfair practice conditions on equity perceptions.

From a resource dependence perspective (Aldrich, 1976; Pfeffer & Salancik, 1978), the relationship between the medical practice and other organizations, *vis a vis* the environment, is fundamentally based on an equitable exchange between these groups (Van de Ven & Walker , 1984). Therefore, less acceptable dependency arrangements are likely to be associated with perceptions of inequity. If a fair exchange does not exist, physicians may attempt to influence the environment to diminish its impact on the organization, thereby enhancing their own ability to pursue preferences. In applying resource dependence theory to the equity-distress-wish to reallocate time pathway, one would expect to see a significant relationship between the characteristics of the practice environment, perceptions of equity, distress and the wish to reallocate time.

Institutional theory suggests environment and organizational variables represent potential sources of inequity if conditions do not conform to broad institutional orthodoxy. However, if conditions do conform to orthodoxy, their impact on equity

should be relatively weak. Concurrently, sensitivity to the expectation of existing institutional norms makes consideration of time reallocation based on personal preferences a less likely response to practice conditions.

As a group, physicians have played a key role in creating the health care institutions, and would be expected to support their underlying assumptions, values and beliefs. Despite what is known about the determinants of health and more effective methods of delivery, quality care is still widely perceived as direct patient care delivered by a doctor in a medical group practice or hospital. These assumptions and beliefs about the health care system are not easily changed, and strategies that do not reflect these assumptions, such as reallocating time away from patient care and toward administrative activities, are less likely to be considered.

Relatively weak associations can be expected between wish to reallocate time, equity, and existing practice conditions. Unlike contingency theory, however, organizational structures and processes are more likely to reflect institutional norms and less likely to reflect practice models seen to promote more efficient and effective use of the physician's time.

Strategic choice theory, on the other hand, takes a much different approach when explaining the link between practice conditions and organizational behaviour (Child, 1972; Ranson, Hinings & Greenwood, 1980; Child 1997). Deterministic organizational theories are seen as failing to adequately consider the effect of physician preferences on practice patterns and organizational arrangements. While acknowledging the importance of the environment and other external constraints, strategic choice theory places greater

emphasis on the capacity of those within an organization to interpret the environment and, based on these interpretations, decide the nature and extent of change (Child, 1997). Decisions over how to design the organization are evolutionary, with new structures and processes emerging as those within the organization gain experience with, and are changed by, the existing organization and the external environment (Ranson et al., 1980).

Based on strategic choice theory, physicians must first be aware of the adverse impact of practice deficiencies on themselves and the health care system before change can occur. Changes in how physicians choose to allocate their time will be in response to their experience within the practice environment and what they perceive to be desirable. The lack of managerial training, the use of what is fundamentally an apprenticeship approach to skill development, and the economic signals created by fee-for-service, therefore make physicians more susceptible to creating and maintaining inefficient and ineffectual organizational structures and practices.

Strategic choice theory predicts a strong relationship between equity and organizational characteristics, based on the argument put forth that organizational characteristics, such as level of practice integration, practice demands and method of remuneration, will influence the perceptions of the decision-makers (Child, 1997). A general lack of managerial experience among physicians suggests the use of more effective organizational structures and processes will not be widespread. Furthermore, the wish to reallocate time in response to inequity is not expected to be greatly influenced by practice characteristics. As a result, only very weak relationships are predicted with the practice condition variables used in this study and the wish to reallocate time.

3.2 Practice Conditions: Catalyst or Constraint?

Practice conditions are expected to play an important role in the equity-distress-wish to reallocate time pathway in one of two ways. One way is to affect the perceived value of inputs and outcomes associated with the equity exchange; thereby, indirectly influencing the time allocated to various professional activities (the preference-oriented approach). Alternatively, practice conditions may constrain the ability of the physician to reallocate time as a strategy for restoring equity (the constraint-driven approach).

The preference-oriented approach, as exemplified by strategic choice theory, suggests that differences in behaviour can be explained by differences in physician preferences (Westert & Groenewegen, 1999). In effect, behaviour will be determined by: the physician's awareness of alternative therapies and treatment strategies; a sense of duty or obligation; the perception that the task is a fundamental aspect of the professional identity; that the task represents an important source of prestige and/or income; or simply finding the task to be enjoyable. Practice variation is explained by differences in opportunities, incentives and influences, causing physicians to differ in their patterns of practice because they value tasks differently.

An alternative explanation is the constraint-driven approach (Lindenberg, 1990), in which physician behaviour is not so much caused by differences in tastes or preferences, as by differences in the characteristics of the social context or environmental constraints. The social context creates specific opportunities and constraints that provide incentives for certain options or restricts behavioural choices. Variations in practice patterns are explained by differences in practice conditions, and the focus is on

understanding the environmental conditions that influence or constrain behaviours.

For example, time allocation choices may vary by location and the type of practice arrangement and, in attempting to restore equity, physicians may find themselves constrained by these practice conditions. As a result, time reallocation might not be perceived by the physician as a viable strategy for restoring equity. Instead, physicians may be inclined to choose strategies such as emotional withdrawal (Koehler et al., 1992; Van Dierendonck et al., 1994, 1996) or elect to pursue greater financial rewards, rather than seeking changes to the level or mix of professional activities,

To determine the most appropriate theoretical perspective, and to establish the relationship between practice conditions, equity, distress and the wish to reallocate time, a number of practice condition variables were considered, including: 1) the objective practice environment; 2) local health care conditions; 3) practice integration; 4) practice demands; and 5) the method of remuneration (Westert & Groenewegen, 1999; Kristiansen & Mooney, 1993; Groenewegen & Hutten, 1991; Lindenberg, 1990).

3.2.1 The Objective Practice Environment

Despite the fact that most physicians in Canada practice within a comprehensive, publicly-funded health care system, they face a variety of environmental factors which may affect or constrain the choices made by individual physicians within the medical practice setting. Environmental factors include: the size of the community (Shimmura, 1988); the specialized training of the physicians (Groenewegen & Hutten, 1991); the size of the practice group (Calnan & Butler, 1988; Branthwaite & Ross, 1988; Groenewegen

& Hutten, 1991); the location of the medical practice (Lepnurm, 1996); and the type of ownership or practice sponsorship (Hadley et al., 1999).

The practice environment may constitute a source of inequity for the physician if seen to apply disproportionately across physician groups. For example, urban-based physicians and many specialists are often seen to have more interesting work and greater prestige and status than general practitioners (Ben-Sira, 1986), and fee schedules are generally seen to favour procedure-based specialties (Eisenberg, 1994).

Practice group size may be important because of its potential to affect workload and the intensity of the on call schedule, as well as its ability to provide collegial support (Jarrett et al., 1989; Steinwald & Steinwald, 1975; Langwell et at., 1987). If the practice setting is perceived as unfair and resistant to change, the physician may look for a new practice setting to restore equity (McKendry et al., 1996). The alternative is for the physician to remain in the current arrangement, experiencing inequity and its inevitable consequences.

3.2.2 Local Health Care Conditions

Concerns about the access and the quality of the health care system are widely held by many people, including physicians (Blendon et al., 2001). Furthermore, the perceived state of the local health care system can be strongly suggestive of the actual state of the health care system and the practice conditions under which physicians are asked to carrying out their responsibilities (Arnetz, 1999). Those perceiving themselves to be working in a poorly managed system are more likely to be experiencing more

difficult working conditions, compared to physicians satisfied with the state of the local health care system (Arnetz, 1997).

The ability to access local health resources and the quality of those resources can place additional demands on the medical practice. In rural and smaller urban centres, access to health services may be adversely affected by the lack of some medical specialties and support services (Godwin, 1996). In many larger centres, increased queuing for surgery may affect access and the timely delivery of care to a greater degree compared to smaller, under-utilized centres (Alter et al., 1999; Cox et al., 1996).

Concerns about access are compounded by quality issues such as: a large proportion of procedures that are unnecessary (Epstein, 1991; Siu et at., 1986; Kemper, 1988); the over-use of medical services due to the incentives created by fee-for-service (Hutchinson & Foley, 1999); and significant differences in the rates of delivery between geographic areas despite similar populations (Wenneberg et al, 1987). As with the objective practice environment, the views of physicians on the state of local health care as it relates to efficiency, access and quality may constitute a source of inequity if seen to be occurring disproportionately among physicians.

In the past, concerns about the state of the health care system would most often be associated with the state of the local acute care hospital. Today physicians are increasingly called upon to work within a variety of practice setting. As a result, the state of community-based and long-term care service are also likely to affect physician perceptions about the quality and accessibility to local health care services.

Power and dependency relationships among practitioners are also expected to influence assessments of fairness (Stolte, 1983). Fewer resources and career options associated with the practice environment may lower expectations, while greater resources and options may raise expectations and the standard by which exchanges of inputs and outcomes are judged to be fair (Lennon & Rosenfield, 1994). Therefore, a lack or even a perceived lack of cooperation among practitioners or participation in policy and planning by physicians may exacerbate perceived inequities or reduce the benefits associated with time reallocation. As well, fewer opportunities to participate in the local planning process, and a work environment marked by poor cooperation among health care providers, may make it more difficult for physicians to control their own work environment or to initiate change.

3.2.3 Practice Integration

As part of the health care reform process, much has been made of the need to more fully integrate the health care system, including physician services (Sapsford, 1997). A number of positive characteristics are ascribed to the integrated practice setting. These include: a focus on community needs; a match between capacity to needs; information systems that support continuity of care; and appropriate financial incentives and organizational structure (Shortell et al., 1996).

Within an integrated health care system, physicians play a key role, but one in which authority is shared with non-physician administrators (Schulz et al., 1997). To be successful, an integrated system also requires physicians to move away from fee-for-

service toward mixed funding formulas, to begin to share responsibility for patient care, and to shift from solo practice toward multi-disciplinary team settings (Mullin, 1998; Marriott & Mable, 1998).

Montague (1994) identified a number of reasons why a physician might prefer a more integrated practice setting. Among these were the wish for less time on call, flexible hours, and access to more support staff and equipment. Working with other health care providers in an integrated practice setting provides more opportunities to adopt alternative approaches to patient care. Furthermore, an integrated practice setting can provide the physician greater flexibility in delegating certain, less desirable activities (Woodward et al., 1996; Breslau et al., 1978). By making time reallocation more feasible, it is anticipated that time reallocation strategies will be considered more often.

Integration can also impact negatively on perceptions of equity and the wish to reallocate time. Seta and Seta (1992) suggest that practice conditions which restrict clinical autonomy will also increase stress. Sondak and Neale (1995) argue that how burdens are shared among practice group members can affect perceptions of equity, and Agius et al. (1996) argue that discretion in decision-making is necessary to reduce practice related stress.

In an integrated practice, choices may be constrained by the need for team cohesion and consensus, possibly reducing the ability of the individual physician to reduce practice-related inequities. Furthermore, some group members may still be able to exercise control over the choice of activities performed, and the distribution of rewards which accrue to them (Cott, 1997; Molm et al., 1993). Physicians unable to exercise

more choice over clinical cases than others are more likely to experience inequity, and the distress that will occur as a result (Hatfield & Sprecher, 1984).

3.2.4 Practice Demands

In addition to the practice environment and the degree of integration, the practice demands or workloads of the individual physician are also expected to affect perceptions of equity, distress, and the wish to reallocate time. Almost half the variance in time spent on patient activities, for example, can be explained by workload variables such as the list size and the number of elderly patients in the practice (Groenewegen et al., 1992). Assuming responsibility for teaching undergraduates can increase the time allocated to patient care without changing the number of patients being treated. As a result, the physician will often work longer hours to maintain a particular level of productivity at the loss of personal time (Vinson et al., 1996).

Practice demands can be thought of as the characteristics of the job which require the attention or resources of physicians, thereby constraining the ability to fulfill personal goals or to address personal needs (Abramis, 1994). Practice demands can also be thought of in terms of the time pressures experienced by the physician in providing patient care (Elovainio & Kivimaki, 1988), and in carrying out other professional activities (Vinson et al, 1996).

Practice demands include: providing high patient quality care and performing complex tasks under significant time constraints; having to deal with problems associated with practice administration; meeting patient expectations; night call duties, long working

hours, and frequent interruptions and emergencies (Mawardi, 1979; Porter et at., 1985; Cooper et at., 1989; Howie et at., 1989; Leung & Becker, 1992; Rout & Rout, 1994; Arnetz, 2001). Practice demands also include: establishing and maintaining clinical competence and developing interpersonal relationships at work; coming to terms with the reality of the medical practice; and dealing with difficult patients (Linn et al., 1985).

Increased practice demands are expected to contribute to perceptions of inequity. Van Yperen (1995) found that when the effort required to gain access to resources was excessively cumbersome, negative attitudes often arose about the equity of the exchange between physicians and other stakeholders.

Practice demands, even if the physician receives substantial financial rewards, can be onerous if they exceed the capabilities of the physician or cause the physician to forego other important goals and objectives. Coping strategies can include taking time for oneself or engaging in an activity unrelated to medicine (Post, 1997). Sometimes collegial support can help offset feelings of inequity; however, failure to address the stress caused by excessive demands will eventually lead to burnout (VanYperen, 1995). When routine coping strategies are insufficient, not used, or unavailable, the physician is more likely to seek other ways to redress excessive practice demands.

In addition to their direct impact on time allocation, excessive practice demands can result in higher levels of stress among physicians (Cohen, 1980). Cooper, Rout and Faragher (1989) found that physicians' levels of stress were affected by: 1) demands of the job such as visiting patients at home during inclement weather, increased demands by patients for second opinions, adverse media publicity, lack of appreciation from patients,

and worrying about patients' complaints; 2) interruptions to family life, emergency calls during surgery hours, dealing with problem patients, and calls at odd hours; 3) conflicts between work and home life; and 4) administration of the practice.

Cohen (1980) identified a lack of predictability, controllability and comprehension about practice circumstances, as factors producing stress among physicians. Post (1997) identified high workloads, third-party interference, and demanding patients as contributing to a physician's level of stress. Agius et al (1996) corroborate the findings of others in identifying work overload and unscheduled interruptions as important work stressors.

3.2.5 The Method and Process of Remuneration

Physicians' overall practice satisfaction is presumed to be related to the expectations they had when they began their medical career. Hadley et al. (1999) argue that financial incentives designed to encourage physicians to practice in a manner contrary to their training are likely to cause dissatisfaction. For example, physicians given incentives to reduce patient care services are much more likely to say their career expectations are not being met. Hadley et al. (1999) further suggest that physicians are often required to participate in objectionable financial arrangements inconsistent with their own practice philosophies because of market requirements.

The method of remuneration and the process used to determine financial rewards are expected to impact on the value placed on various inputs and outcomes used to assess equity. Katz et al. (1997) noted that the negotiation of fee schedules between physicians,

and between physicians and the government are rife with conflict and suspicion. Because people compare their actual rewards to the rewards they think they deserve, one can be objectively under-rewarded and feel satisfied, or be objectively over-rewarded and be dissatisfied (Lennon & Rosenfield, 1994); therefore, a method of payment perceived to be fair is essential. The preferential remuneration of discrete technically-based procedurals may also affect the extent to which physicians may wish to reallocate their time due to the potential impact on their income levels.

3.3 The Characteristics of Individual Physicians

In addition to the characteristics of the medical practice, the personal characteristics and social situation of the individual may influence how that physician perceives the factors affecting equity, and the manner in which the physician ultimately responds to any perceived inequity. Characteristics to be considered in this study include gender, age, years of experience, marital status, and living arrangements.

3.3.1 Gender

Empirical evidence indicates female physicians work fewer hours than male physicians (Sanmartin & Snidal, 1993), and historically, female physicians have worked fewer weeks per year, shorter hours per week, and produce fewer units of patient services (Weisman & Teitelbaum, 1987; Dedobbeleer et al., 1995). There are two theoretical perspectives explaining why gender differences are seen in the time allocated to professional activities. The first is an economic theory of time allocation based on

different family circumstances of men and women. The spouse with the higher income is more likely to allocate more time toward professional activities in order to maximize family utility (Weisman & Teitelbaum, 1987). High income women are also more likely to have high income spouses, while high income males are more likely to have lower income spouses. As a result, men are more likely to allocate more hours to work related activities due to economic necessity.

The second theoretical perspective argues that personal tastes and social norms influence allocation decisions (Geerken & Gove, 1983; Berk, 1985). Because of traditional gender-role norms, men's work roles are permitted to intrude on their family roles, but not the reverse, whereas women's family roles are permitted to intrude on their work roles, but not the reverse (Weisman & Teitelbaum, 1987). Both perspectives suggest that professional time reallocation decisions that are contingent on total work time available are more likely to be constrained among female physicians.

Studies also suggest that female physicians are likely to spend more time with their patients, and more likely to be in group practice (Frank et al., 1997), but are equally likely to rely on fee-for-service compared to their male counterparts (Woodward & Hurley, 1995). Woodward and Hurley (1995) found that female physicians also tended to see fewer patients within the same amount of time and to bill more per patient. Supporting these findings was a study by Langwell (1992), which found evidence of a compensatory strategy of higher billing rates among physicians seeing fewer patients.

Compared to female physicians, male physicians are particularly distressed by: the impact of time pressures on family time; the uncertainty associated with being on call;

paperwork; and telephone interruptions (Rout, 1996). Sources of stress among female practitioners include: time away from family; fatigue due to long working hours; role conflict; work overload (due in part to role conflict); and lack of support from colleagues.

Regardless of gender, physicians must find ways to deal with excessive demands in a manner that relates to their background, personal qualities, and institutional characteristics (Parkes, 1986). A common coping strategy among male physicians is exercise, while female practitioners are more likely to discuss issues with their spouse as a way to cope, or by separating work and home life (Rout, 1996).

In the past, women were more likely to view the rewards of affiliation as an important outcome of their work (Walster & Walster, 1975). Women tended to value pay and promotion less, placing more value on interpersonal relationships. More recent research suggests that there are few differences between men and women (Nieva & Gutek, 1981). Men and women are now more likely to pursue similar rewards for the work they do, with convergence between groups regarding the value of their work in contributing to the delivery of quality health care.

3.3.2 Age and Years of Experience

Gender-based differences appear to be declining, particularly in younger cohorts. One reason is that the number of hours worked by male physicians is also declining (Freiman & Marder, 1984), possibly due to changes in lifestyle and increased competition among physicians. As well, young women may be more career oriented or less committed to traditional family roles than in the past (Weisman & Teitelbaum, 1987).

McCullough et al (1999) observed that the expectations of physicians have changed over the last twenty years. Younger physicians are more likely to bypass private practice in favour of employment within a larger health care organization. The appeal includes: being part of an integrated delivery system; more flexible work schedules; and the ability to spend more time with family or to pursue leisure activities.

In their study of recruitment incentives, McCullough et al. (1999) also found that male physicians with more than 6 years of practice, and those working in physician managed groups placed greater importance on the reputation and earning potential of a prospective practice group. They found that females physicians with less than five years of experience were more likely to seek flexibility in hours, subsidized rents and loan supports. Their conclusion was that different types of physicians were motivated by different incentives.

In a study of new family physicians, Woodward et al. (1995) found generally positive attitudes toward shifting resources to preventive care, and making greater use of salaries as an alternative to fee-for-service. Age appeared to affect the preferences of physicians toward types of patients, with older physicians more likely to prefer chronic and older patients (Cohen et al, 1996). Less experienced physicians are also more likely to be attracted to guaranteed incomes and benefits, and being part of an integrated health care organization.

3.3.3 Marital Status and Living Arrangements

Most physicians have some degree of conflict between meeting the needs of their

patients and the responsibilities of their private lives. Family responsibilities are expected to impact on the wish to reallocate time, and include: spouse working outside the home; hours worked by the spouse; the number of children under eighteen years of age; and the presence of preschool children (Weisman & Teitelbaum; 1987).

Woodward et al. (1996) found that time spent on professional activities differed between male and female physicians. More female physicians work part-time, and even full-time female physicians tend to work fewer hours than their male counterparts. The reasons suggested were marital status and parenthood, with women assuming greater responsibility for housework and child-rearing than their male counterparts. However, among family practitioners, there was very little difference in time spent on professional activities between male and female physicians with school-aged children (Woodward et al., 1996). Female physicians were also less likely to curtail their professional time once their children entered the educational system full-time.

Studies by Woodward, Williams and their colleagues (1996, 1995) show that physicians with young children, particularly lone parents, have greater responsibilities at home than those whose children are in school or college. Earlier studies suggested male physicians with small children tended to increase their hours of professional activity (Mitchell, 1984; Uhlenburg & Cooney, 1990).

3.4 Hypothesizing an Equity-Distress-Wish to Reallocate Time Model

This study hypothesizes the existence of a multi-stage pathway from practice conditions to the wish to reallocate time. The premise to be addressed is that practice

conditions contribute to perceptions of inequity and distress among physicians, resulting in the wish to reallocate time. The hypotheses to be tested are illustrated in a equity-distress-time allocation model (Figure 5).

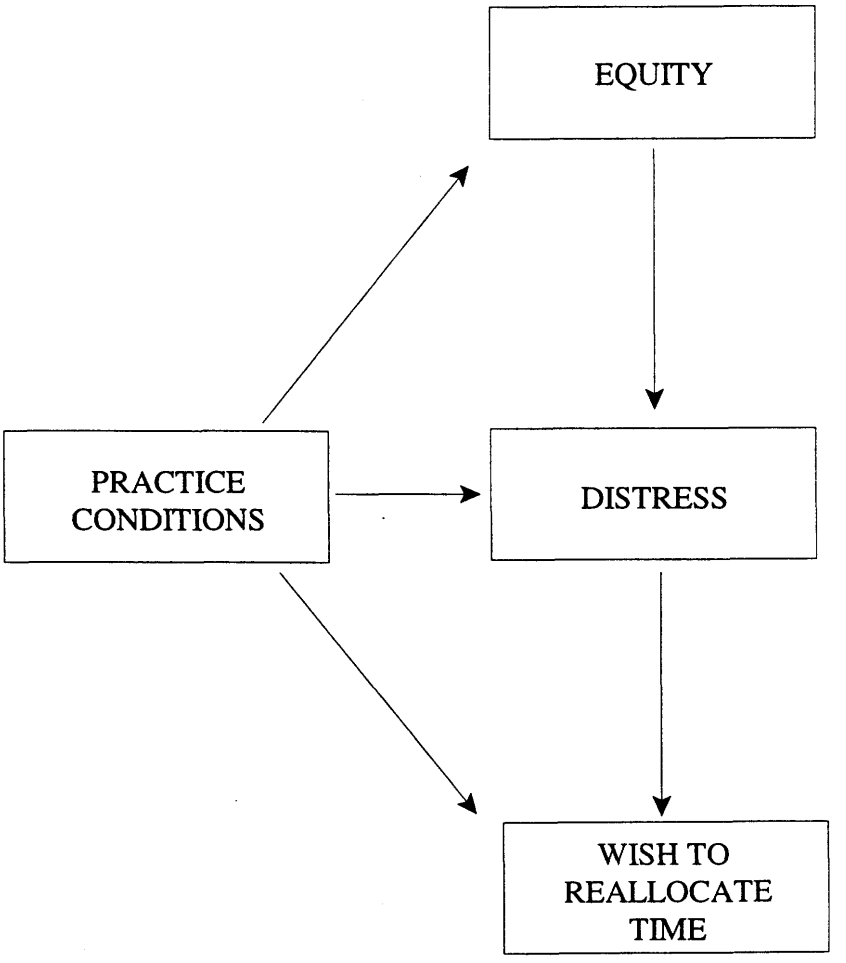

Figure 5: Hypothesized Model Pathways

Hypothesis I: Controlling for immutable and mutable physician characteristics, there is no significant association between practice conditions and perceptions of equity among physicians. Practice conditions are defined as the practice environment, practice integration, practice demands and remuneration:

$$Equity \neq f(Practice\ Conditions,\ Control\ Variables)$$

Sub-hypothesis 1a:

Objective environmental factors are not significantly related to perceptions of equity among actively practising physicians:

$$Equity \neq f(community\ size;\ specialty\ designation;\ practice\ location;\ practice\ ownership;\ group\ practice\ size;\ and\ control\ variables)$$

Sub-hypothesis 1b:

The state of the health system is not significantly related to perceptions of equity among actively practising physicians:

$$Equity \neq f(over\text{-}all\ quality;\ efficiency;\ access\ to\ community\ services;\ access\ to\ hospital\ services;\ access\ to\ long\text{-}term\ care;\ level\ of\ cooperation;\ level\ of\ participation;\ quality\ of\ community\ services;\ quality\ of\ hospital\ services;\ quality\ of\ long\text{-}term\ care;\ and\ control\ variables)$$

Sub-hypothesis 1c:

The level of practice integration is not significantly related to perceptions of equity among actively practising physicians:

Equity ≠ f(practice arrangement; appropriateness of arrangement; ability to change arrangement; share medical records; have group meetings; role of nurse in practice; refer to allied professions; refer to health support workers; and control variables)

Sub-hypothesis 1d:

The level of practice demands is not significantly related to perceptions of equity among actively practising physicians:

Equity ≠ f(work hours, time allotted to patient care; time allotted to teaching and research; time allotted to continuing education; time allotted to administration; and control variables)

Equity ≠ f (weekdays on call; weekends on call; and control variables)

Equity ≠ f(proportion of patient with complex clinical problems; proportion of patients with low socioeconomic status; proportion of patients with personal problems; and control variables)

Equity ≠ f(coping with time demands; and control variables)

Sub-hypothesis 1e:

Remuneration and remuneration issues are not significantly related to perceptions of equity among actively practising physicians:

Equity ≠ f(method of remuneration; appropriateness of the method of remuneration; ability to change method of remuneration; process used to determine level of remuneration; and control variables)

Hypothesis II: Controlling for physician characteristics and practice conditions, there is no significant association between distress and perceptions of equity among physicians:

Distress = f(Equity, Practice Conditions, Control Variables)

Sub-hypothesis 2a:

Objective environmental factors are not significantly related to distress among actively practising physicians:

Distress ≠ f(equity; community size; specialty designation; practice location; practice ownership; group practice size; and control variables)

Sub-hypothesis 2b:

The state of the health system is not significantly related to distress among actively practising physicians:

Distress ≠ f(equity; over-all quality; efficiency; access to community services; access to hospital services; access to long-term care; level of cooperation;

level of participation; quality of community services; quality of hospital services; quality of long-term care; and control variables)

Sub-hypothesis 2c:

The level of practice integration is not significantly related to distress among actively practising physicians:

Distress ≠ f(equity; practice arrangement; appropriateness of arrangement; ability to change arrangement; share medical records; have group meetings; role of nurse in practice; refer to allied professions; refer to health support workers; and control variables)

Sub-hypothesis 2d:

The level of practice demands is not significantly related to distress among actively practising physicians:

Distress ≠ f(equity; work hours, time allotted to patient care; time allotted to teaching and research; time allotted to continuing education; time allotted to administration; and control variables)

Distress ≠ f (equity; weekdays on call; weekends on call; and control variables)

Distress ≠ f(equity; proportion of patient with complex clinical problems; proportion of patients with low socioeconomic status; proportion of

patients with personal problems; and control variables)

Distress ≠ f(equity; coping with time demands; and control variables)

Sub-hypothesis 2e:

Remuneration and remuneration issues are not significantly related to distress among actively practising physicians:

Distress ≠ f(equity; method of remuneration; appropriateness of the method of remuneration; ability to change method of remuneration; process used to determine level of remuneration; and control variables)

Hypothesis III: Controlling for immutable and mutable physician characteristics, practice conditions, and perceptions of equity, there is no significant association between distress and the wish to reallocate time (WRT) among physicians:

WRT = f(Distress, Equity, Practice Conditions, Control Variables)

Sub-hypothesis 3a:

Objective environmental factors are not significantly related to the wish to reallocate time among actively practising physicians:

WRT ≠ f(distress; equity; community size; specialty designation; practice location; practice ownership; group practice size; and control variables)

Sub-hypothesis 3b:

The state of the health system is not significantly related to the wish to reallocate time among actively practising physicians:

WRT ≠ f(distress; equity; over-all quality; efficiency; access to community services; access to hospital services; access to long-term care; level of cooperation; level of participation; quality of community services; quality of hospital services; quality of long-term care; and control variables)

Sub-hypothesis 3c:

The level of practice integration is not significantly related to the wish to reallocate time among actively practising physicians:

WRT ≠ f(distress; equity; practice arrangement; appropriateness of arrangement; ability to change arrangement; share medical records; have group meetings; role of nurse in practice; refer to allied professions; refer to health support workers; and control variables)

Sub-hypothesis 3d:

The level of practice demands is not significantly related to the wish to reallocate time among actively practising physicians:

WRT ≠ f(distress; equity; work hours, time allotted to patient care; time allotted to teaching and research; time allotted to continuing education; time allotted to administration; and control variables)

WRT ≠ f (distress; equity; weekdays on call; weekends on call; and control variables)

WRT ≠ f(distress; equity; proportion of patient with complex clinical problems; proportion of patients with low socioeconomic status; proportion of patients with personal problems; and control variables)

WRT ≠ f(distress; equity; coping with time demands; and control variables)

Sub-hypothesis 3e:

Remuneration and remuneration issues are not significantly related to wish to reallocate time among actively practising physicians:

WRT ≠ f(distress; equity; method of remuneration; appropriateness of the method of remuneration; ability to change method of remuneration; process used to determine level of remuneration; and control variables)

4.0 Methods

4.1 Study Design

"Physician Equity and the Wish to Reallocate Time" was a two wave modified panel study consisting of baseline and follow-up at one year. The study design raised the possibility of demonstrating causality through repeated measures identifying changes occurring over time. However, the objectives of the study were, in part, to develop and test new scales. This caused a number of items to be modified, added, or deleted between baseline and follow-up. Temporal comparisons were not considered feasible, but will be pursued in future research. As well, the use of a single group at baseline and followup introduced a number of potential threats to internal validity (Cook & Campbell, 1979).

As an observational design, a cross sectional study is limited in its ability to demonstrate causality, however, it does allow significant relationships between the variables under investigation to be established while controlling for other explanatory factors (Hennekens & Buring, 1987; Cook & Campbell, 1979).

Data were collected on two occasions (one year apart) to allow for the development and testing of the original instrument. Baseline data were collected in December 1998/January 1999 using a questionnaire booklet mailed to a stratified random sample of 840 physicians in Saskatchewan and British Columbia, with the follow-up data collected between February and April 2000.

4.2 Study Population

Physicians actively practising in Saskatchewan and British Columbia in 1998 were chosen as the study population. The randomly selected baseline study sample included 240 Saskatchewan physicians and 600 British Columbia physicians (Table 4.2.1). To support comparison between gender and specialty groups, a disproportional stratified sampling frame was used (Weisman & Teitelbaum, 1987).

Table 4.2.1 Sampling Frame (Eligible)

Region	Saskatchewan	BC (Vancouver & the Lower Mainland)	BC Interior
Total Sample	240	313	287
Female GP	60	75	75
Male GP	60	75	75
Female Specialist	60	88	62
Male Specialist	60	75	75

The Saskatchewan sample consisted of 120 females physicians (60 general practitioners and 60 specialists) and 120 male physicians (60 general practitioners and 60 specialists). For the British Columbia sample, a similar stratification strategy was employed resulting in the random selection of 300 female and 300 male physicians, equally divided into general practitioners and specialists. The British Columbia sample was further stratified by regions: 313 from Vancouver Island, Vancouver and the Lower Mainland, and 287 from the British Columba Interior. The number of female specialists was slightly skewed, with a larger portion of the sample coming from the Lower

Mainland and Vancouver Island.

A total of 384 physicians responded to the baseline survey for a unadjusted response rate of 45.7%. Fourteen questionnaires were returned because the physician had retired or was no longer at that address, including seven from Saskatchewan and seven from British Columbia. The fourteen physicians were subsequently excluded from the study resulting in a study sample of 826 and an adjusted response rate of 46.5%. The response rate at baseline was similar to that reported by other researchers using mail-out surveys to Canadian physicians (Sullivan & Buske, 1998)

Table 4.2.2 Comparing Responders and Non-responders - Baseline Questionnaire

Category	Responder N (%)	Non-responder N (%)	Sig (Likelihood Ratio)
BC (Van & L Main)	136 (43.9)	174 (56.1)	0.474
BC Interior	138 (48.8)	145 (51.2)	
Saskatchewan	110 (47.2)	123 (52.8)	
Female	188 (45.7)	223 (54.3)	0.668
Male	196 (47.2)	219 (52.8)	
General Practitioner	179 (43.3)	234 (56.7)	0.070
Specialist	205 (49.6)	208 (50.4)	
Total	384 (46.5)	442 (54.3)	-

Analysis using Crosstabs and the Likelihood Ratio statistic showed no significant differences between respondents and non-respondents based on gender, specialty or geographic region (Table 4.2.2), although specialists were somewhat more inclined to

respond to the survey (49.6% vs 43.3%). The borderline significant difference in response rate between general practitioners and specialists was subjected to further analysis to determine its potential as a source of bias. No significant differences were found among general practitioners based on gender ($p = 0.955$) or region ($p = 0.781$). Among specialists, neither gender ($p = 0.588$) nor region ($p = 0.324$) were found to be significant.

The follow-up survey sample was the 384 physicians responding to the baseline questionnaire (110 from Saskatchewan and 274 from British Columbia). Thirteen followup questionnaires were deemed ineligible or returned "not completed" due to retirement, or because the physician had moved during the previous year. A total of 240 usable questionnaires were returned from the remaining 371 eligible respondents for a response rate of 64.7% (72 from Saskatchewan and 168 from British Columbia). No response bias was found based on gender, specialty or region (Table 4.2.3).

Table 4.2.3 Comparing Responders and Non-responders - Followup Questionnaire

Category	Responder N (%)	Non-responder N (%)	Sig (Likelihood Ratio)
British Columbia	168 (63.2)	98 (36.8)	0.323
Saskatchewan	72 (68.6)	33 (31.4)	
Female	118 (64.8)	64 (35.2)	0.954
Male	122 (64.6)	67 (35.4)	
General Practitioner	111 (63.4)	64 (36.6)	0.631
Specialist	129 (65.8)	67 (34.2)	
Total	240 (64.7)	131 (35.3)	-

4.3 Wish to Reallocate Time-Equity Models

Three main hypotheses were to be tested. The principal domains and relationships to be tested have been summarized in Table 4.3.1. The first hypothesis to be tested was with regard to the strength of the relationship between practice conditions and the physicians' perceptions of equity:

$$Equity \neq f(Practice\ Conditions,\ Control\ Variables)$$

The second hypothesis to be tested was with regard to the strength of the relationships between practice conditions, equity and distress among physicians:

$$Distress \neq f(Equity,\ Practice\ Conditions,\ Control\ Variable)$$

The third hypothesis to be tested was with regard to the contribution of practice conditions, equity, and distress to the wish to reallocate time (WRT):

$$WRT \neq f(Distress,\ Equity,\ Practice\ Conditions,\ Control\ Variables$$

Table 4.3.1 The Domains and Models to be Tested

Hypothesis	Dependent Variables	Independent Variables	Control Variables
1	Equity	Practice Conditions	Gender Age Marital Status Number of Children Years of Practice
2	Distress	Equity Practice Conditions	
3	Wish to Reallocate Time	Distress Equity Practice Conditions	

4.4 Defining The Measures

4.4.1 Equity (Distributive and Process)

At baseline, perceptions of equity were measured using 20 items drawn from studies by: Linn et al. (1985); Stevenson, Williams & Vayda (1988), Koehler et al. (1992); Van Dierendonck et al. (1994); and Burke (1996). Items were measured using five point Likert scales with a neutral midpoint (Appendix 1). Three types of metrics were used to quantify the items (very high to very low; very often to very rarely; and strongly agree to strongly disagree).

Follow-up: In addition to the global measure: *In general, the rewards (tangible and intangible) for the work you do are:*, fifteen items were used to capture opinions about aspects of equity (Appendix 2). Items included questions regarding specific inputs and outcomes and the quality of the physician's exchange relationships based on their own internal standard, as well as in relation to other physicians.

Two items, *level of influence* and *remuneration fairly reflects geographic location*, were dropped from the follow-up questionnaire. The item, *share of difficult patients,* was deemed too ambiguous, as treating a difficult patient might be assessed as an input (effort) or outcome (interesting) depending on the equity sensitivity of the physician (Huseman et al, 1987).

4.4.2 Distress (and Coping with Practice Conditions)

At baseline, the physician's distress was captured using items drawn from the Maslach Burnout survey (Maslach & Jackson, 1981), the Bortner'sType A survey

(Bortner, 1969), and a measure of physician mental workload by Bertram et al. (1990). Six items were measured using a five point Likert scale anchored with *very often-very rarely* (Appendix 1). One item was anchored with *very high-very low*. Items seen to measure distress and thus capture the physician's response to inequity were: *get tasks done without feeling rushed, experience conflict between work and family, experience fatigue*, and *level of stress*. Items measuring the physician's ability to cope were: h*ave time to keep up, regularly interacting with colleagues,* and *get enough sleep.*

At follow-up, a more thorough distinction was drawn between the distress experienced by physicians and the physician's capacity to cope. The number of items was expanded to ten to increase the number of items associated with each concept (Appendix 2). Items added to expand distress included: *experience frustration in gaining access to resources for your patients* and *experience frustration in dealing with demanding patients. Take time to pursue special interests* was added to coping.

4.4.3 Wish to Reallocate Time

At baseline: Physicians were asked to respond to questions representing the four main components of duties performed by physicians, and the hours dedicated to these activities. These components are regularly surveyed by the Canadian Medical Association, and include: *A) patient care, B) teaching & research, C) maintaining knowledge, and D) administration.* Eighteen items using a three point scale *(more, no change, less*) were used to capture physician preferences regarding reallocation of time. Six items were used to capture time allocated to patient care, with four items each used to

capture teaching and research, maintaining knowledge and administrative duties (Appendix 1).

Based on the content validity of the measures, five time allocation scales were identified from the 18 survey items. One for each functional area and a summary scale of all 18 items. *More or less activity were scored as one (1) and no change as zero (0).* Patient Care ranged from zero (no change in time allocated to patient activities) to six (change time allocated to all six care activities). Teaching and Research, Maintaining Knowledge Base, and Management Functions scales each produced values that ranged from zero to four.

At follow-up: A number of physicians appeared to struggle with the format used in this section of the baseline survey and it proved to be the least completed portion of the questionnaire. Physicians had difficulty estimating time allotted to all the activities listed and the number of items was reduced to ten (Appendix 2). This was achieved by collapsing conceptually related items and expanding the metric to provide greater sensitivity. Four questions subsequently represented tasks associated with direct patient care, and two questions each represented teaching and research, maintaining knowledge and management functions. Each question was measured using a five-point Likert scale of: *Much More, More, No Change, Less, Much Less.*

Changes were also made to simplify the collection of data regarding total hours worked and the percent of time allocated to each of the four functional areas. This revised wish to reallocate time section of the questionnaire was completed at a rate similar to the other sections of the follow-up survey. The revised measures also allowed

the present time allocation of the physician to be quantified, both in terms of the percent of total time, and the actual hours dedicated to each functional area.

Based on the 5-point time preference scales, a truncated scale was created to allow for time preference constructs. First, a value of zero was assigned to *no change*, a value of one for *more* and *less*, and a value of two for *much more* and *much less* to produce a three point scale measuring the degree of absolute change preference for each item. As with the baseline data, the purpose of the trinomial time scales was to prevent *more* and *less* responses from cancelling each other out when combined into a larger composite scale. In multiple item scaling, time tradeoff between items would result in construct scales with a bias toward no change. Trichotomizing provided the opportunity to create multi-item scales measuring the absolute degree to which the physician wished to reallocate time within the four functional areas of a medical practice.

A weighted WRT scale was also created based on wish to reallocate time and time currently allocated to each of the four functional areas. A base value of one plus the portion of total activity was used as the multiplier to ensure that an expressed desire to begin a new activity was captured. For example, if the total unweighted *direct patient care* scale value was 4 and patient care represented 70% of the physician's time, the weight-adjusted score would be 6.8 (4 x 1.70). Using percent of total time only was rejected as the multiplier; activities in which the physician was not presently engaged would have resulted in a multiplier of zero and a weighted value of zero (no change) for any new activities the physician may have wanted to initiated.

4.4.4 Practice Conditions

4.4.4.1 Practice Environment

At baseline, the practice environment measures consisted of a number of items drawn from surveys by the Canadian Medical Association, the Canadian College of Family Practitioners and the typologies of Williams, et al., (1990). Environmental variables included community size, location of the primary office, sponsorship, speciality, and group size (number of physicians in the practice group), (Appendix 1). Community size was measured as a eight point ordinal scale ranging from communities of less that five thousand to communities of over one million. Location of the medical practice was measured using a nominal scale of possible primary office locations, including residential, commercial and hospital. Physician sponsorship was captured in a nominal scale. Categories included physician, university, hospital, local community group, and health district. Specialty was categorized as family practitioner or specialists, with specialty further segmented by cognitive[1], procedural[2] or technical[3] specialist. Group size was measured as a continuous variable.

Ten questions were also asked regarding the physician's perception of the state of the local health care system. Three questions asked physicians to rate the quality of community-based, hospital-based and long term care services in their community using

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[1] Dermatologists, internists (including physiatrists), neurologists, pediatricians (including medical geneticists) and psychiatrists

[2] Obstetricians and gynaecologists, otolaryngologists, ophthalmologists and surgeons (including general, thoracic, orthopedic, plastic & reconstructive, neurological and urological).

[3] Anaesthetists, pathologists and radiologists (including diagnostic and therapeutic).

11 point scales ranging from zero (the worst) to 100 (the best). A global question regarding quality was measured using a five point Likert (Very good to very poor). Three questions rating access to community-based, hospital and long-term care services were posed using 5 point Likerts (Excellent to Very Poor). Physicians were also asked to rate the efficiency of the local system, as well as cooperation among health professionals and participation by physicians in policy and planning (Very High to Very Low).

At follow-up, Group size was determined more precisely with physicians asked to specify the total number of physicians in the practice group including themselves (Appendix 2). Due to a lack of space, location and sponsorship were not asked on the follow-up questionnaire. It was felt that few changes would occur between the questionnaires and these changes would be captured by changes in address.

4.4.4.2 Practice Integration

At Baseline: Variables measured in the baseline questionnaire included organizational arrangement and the sharing of medical records. Organizational arrangements were measured on a five point ordinal scale designed to capture interdependency. The scale included: individual/solo practice; share office expenses; share office and clinical staff expenses; share revenues and expenses; and other (primarily hospital, academic, community clinic based practices). Sharing medical records was a simple yes or no to the question of, *Does your group share medical records?*

At Follow-up: A number of questions were added to evaluate the level of integration. In addition to questions about organizational arrangement, questions were

added about the appropriateness of the present organizational arrangement and the ability to change these arrangements, as well as the interdisciplinary nature of the practice. *Appropriateness* was measured using a five-point Likert scales ranging from strongly agree to strongly disagree. *Flexibility* was measured using a six-point Likert scale ranging from very easy to very difficult. The interdisciplinary nature of the practice was captured with two questions about the use of referrals to allied health professions and other support groups.

4.4.4.3 Practice Demands

At baseline, the physician's time demands were measured using total hours worked, the proportion of time currently allocated to each activity, and the physician's on call commitments. These questions were not fully completed by a large number of physicians and a substantial revision and re-conceptualizing of this portion of the questionnaire became necessary.

At follow-up, hours of work, the proportion of time devoted to various activities and time on call were modified. Although some detail was lost, the simpler format improved physician response regarding current workloads. Time demands were also captured in the stress portion of the questionnaire at both baseline and follow-up. The item *share of difficult patients*, originally included as an equity measure, was seen to have value as a practice demand measure and for the follow-up questionnaire, the concept was expanded into three questions regarding the proportion of patients with: complex clinical problems; economic status; and personal/family problems.

Table 4.4 Components for Each Variable

Time Preference	Distress	Equity	Practice Conditions		Control Variables
Overall	Distress	Overall	Environment	Integration	Gender
			Community	Arrangement	
Patient Care		Extrinsic Tangible	Group Size	Appropriate & Flexible	
			Specialty		Age
Teaching & Research		Intrinsic	Location	Share Records	
			Sponsor	Referral Types & Rates	
			Local Health Care System		Marital Status
Maintaining Knowledge		Extrinsic Intangible			
			Demands	Remuneration	
			Hours Worked	Method	Number of Children
Management Functions	Coping with the practice*		Patient Mix		
			Time Now Allotted	Appropriate & Flexible	
			Time On Call		Years of Practice

* Measured in the distress portion of questionnaire. Coping with practice demands included as a component of practice demands under practice conditions. To be tested in all three stages of the model: the wish to reallocate time, distress, and equity.

4.4.4.4 Remuneration

Method of payment was measured using a scale designed to capture the proportion of income derived from fee-for-service, salary, capitation, and sessional remuneration. A dichotomous method of payment variable was created using more than 80% fee-for-service as the cut-off (Woodward et al., 1996).

At follow-up, appropriateness and flexibility were captured by two questions about the method of remuneration. Appropriateness was measured using a 5-point Likert scale ranging from strongly agree to strongly disagree. *Flexibility* was measured using a six-point Likert scale ranging from very easy to very difficult.

4.4.6 Control Variables

At baseline, demographic data were collected on both *immutable* and *mutable* control variables (Appendix 1). Immutable variables included age, gender, marital status, and the number and age of dependents. The mutable variables included years of practice (total years), and previous work experience (positions held and number of years). Age was evaluated both as a continuous variable as well as an ordinal scale with defined groups (young:< 35, prime:35-50, and senior:>55), as proposed by Dedobbeleer et al (1995). *At follow-up*, the same data were collected with the modification that work experience prior to entering medical school was not to include summer jobs.

4.5 Data Collection Methods

Baseline Survey: To ensure an adequate response rate to the baseline questionnaire, each physician was designated to receive two questionnaires mailed approximately six weeks apart. This was to be followed by a reminder card three weeks after the second mail-out. A letter of introduction and letters of support from the Canadian Medical Association and their own provincial association (BCMA and SMA) were enclosed with each survey. A prepaid, self-addressed envelop was also included to

encourage physicians to participate.

In November and December, 1998 and January, 1999, surveys designed to measure perceptions of equity, distress, wish to reallocate time, and practice conditions were sent out to 240 physicians in Saskatchewan and 600 physicians in British Columbia. The response rate from two mail-outs and a reminder card was 46%. Preliminary analysis based on gender, specialty and province indicated that there was no significant non-response bias. A total of 385 physician questionnaires were received and deemed usable.

Follow-up: The first mail-out of the revised questionnaire occurred in February 2000 and was sent to all 385 physicians who had responded to the baseline questionnaire. Each physician received a report on the data collected in the baseline survey that was not repeated in the follow-up questionnaire. This report was a fulfilment of a promise to the participating physicians that they would receive annual bulletins on the project and its findings in exchange for their ongoing participation. The report along with a letter from the Principal Investigator were seen as important for ensuring ongoing participation by the physicians. A second mail out to physicians occurred in mid-March, 2000.

4.6 Establishing Valid and Reliable Measures

Prior to model testing, composite scales representing wish to reallocate time, distress, coping and equity were developed and tested using factor analysis and inter-item correlation matrices. Preliminary inclusion of items in the baseline questionnaire and the addition of new items to the followup questionnaire were based on *content validity* as derived from a review of the relevant literature. Factor analysis was then used to identify

and summarize correlated variables for the purpose of developing the main pathway variables: equity, distress, wish to reallocate time.

Exploratory factor analysis is the appropriate technique for determining which items represent a critical attribute of each construct (Brink and Wood, 1989). Factor analysis is used to form coherent and distinct measures or scales from a larger set of variables. Interpreting and naming factors, however, depends on the meaning of the particular combination of variables. Once this has been established, construct validity can be established by demonstrating covariance between the construct and other variables as predicted by theory (Tabachnick & Fidell, 1996).

Limitations of factor analysis include the fact that there is no criterion variable against which to test the solution and that, after extracting, there are an infinite number of rotations available. As a result there is a level of ambiguity associated with the technique. Ultimately, decisions about the number of factors and rotational schemes will be based more on pragmatic considerations than theoretical criteria (Tabachnick & Fidell, 1996).

While factor analysis may support the inclusion of a number of items into a particular construct and can be used to support construct validity (the scale measures what it purports to measure), the reliability and parsimony of the construct must also be established. Reliability testing was carried out to determine the composite scales' Cronbach's alphas, inter-item correlations, and total inter-item correlations. An alpha greater than 0.70 is generally considered acceptable (Cortina, 1993). Due to a limited number of items, however, some of the sub-scales produced internal consistencies within the range of 0.50 to 0.70 (coping 0.64; patient care 0.58, external intangible equity 0.56).

Although relatively weak, these scales were retained to provide more complete representation of the conceptual framework.

To ensure that alpha scores are not due to redundancy among the items, items producing inter-item correlations greater than 0.70 were excluded. As well, construct parsimony (only items contributing significantly to the scale) was maintained by removing items with total inter-item correlations less than 0.30 from composite scales.

4.6.1 Equity

Factor analysis uses principal component analysis to establish the maximum amount of variance that can be explained with the fewest possible factors. While principal component analysis can establish parsimony and the relative independence of the factors, the factors must be rotated to ensure the factors are conceptually meaningful. There are two methods of rotating the factors; orthogonal and oblique. Factors resulting from orthogonal rotation remain statistically unrelated, whereas factors resulting from oblique rotation are usually correlated to some extent. Statistically uncorrelated factors are preferred because they can represent a more complex set of arrangements. However, orthogonal rotation may not result in finding the best set of rotated factors, and oblique rotation can often result in more interpretable factors. Both methods of factor rotation were carried out in this study (Kleinbaum et al., 1988).

Correlation coefficients tend to be less reliable when estimated from small sample; therefore, as a general rule of thumb it is recommended to have at least 300 cases for factor analysis, with less required if there are several high loading marker variables

(Tabachnick & Fidell, 1996). Because the loading values were unknown and the total sample was 384 at baseline and 240 at follow-up, missing data were replaced with value means to provide the largest possible sample. Due to the possibility that missing data were not randomly dispersed, factor analysis was also carried out using only complete cases to confirm the initial findings.

Baseline: Twelve survey items representing various aspects of extrinsic (tangible and intangible) and intrinsic equity were subjected to factor analysis. No differences were found between rotational methods (orthogonal vs. oblique) or data inclusion criteria. The principal components and rotated matrices presented here are based on orthogonal rotation (Varimax) and the complete data set (missing data replaced with value means).

Table 4.6.1.1 Final List of Equity Items Total Variance Explained

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	3.624	32.948	32.948
2	1.512	13.743	46.692
3	1.431	11.04	57.731
11	0.359	3.266	100

Extraction Method: Principal Component Analysis

Principal component analysis resulted in three components with an eigenvalue great than one, that explained more than 57% of variance (Table 4.6.1.1). Four of the items: *pay reflects stress, pay reflects experience, equity of rewards* and *work to hard for rewards received*, loaded into a construct (Cronbach's alpha = 0.79) designated

"tangibles" (Table 4.6.1.2). Fours items: *interesting work, sense of accomplishment, patients are appreciative* and *extra effort worth the effort*, formed a second construct (Cronbach's alpha = 0.67) designated "intangibles 1". Finally, three items, all dealing with respect from others, loaded into a construct designated "intangibles 2" (Cronbach's alpha = 0.58). One item measuring the amount of trivial work was not found to contribute significantly to any of the constructs nor contribute to explained total variance.

Table 4.6.1.2 Final List of Equity Items - Rotated Component Matrix

Item	Component			Cronbach Alpha
	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	
Pay Reflects Work Stress	0.828			0.79
Pay Reflects Experience	0.828			
Equity of Rewards	0.667			
Work Too Hard	0.665			
Interesting Work		0.807		0.67
Sense of Accomplishment		0.767		
Patients Are Appreciative		0.517		
Extra Effort	0.426	0.486		
Respect by Nurses			0.861	0.58
Respect by Patients			0.687	
Respect by Administrators			0.601	

Rotation Method: Varimax with Kaiser Normalization

An overall equity scale was created based on the 11 items identified in the three equity components. Of these, the three "respect" items were not found to contribute significantly to the construct. The final eight item equity construct (Table 4.6.1.3) had a reliability of 0.80 (Cronbach's alpha).

Table 4.6.1.3 Reliability - Overall Equity Construct (8 items)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Delete
IWORK	23.2228	19.6206	.3800	.3076	.7984
APPRPT	22.7270	19.0258	.4220	.2114	.7934
ACCOMP	22.9499	18.9472	.4921	.3806	.7845
EXEFF	22.7047	18.1305	.4939	.2567	.7836
EXPERIENCE	22.4457	17.2030	.5417	.4159	.7765
WORKHARD	21.9916	17.5334	.5600	.3559	.7734
STRESS	21.9554	17.0706	.5672	.4541	.7721
REWARDS	22.1309	16.6169	.6466	.4319	.7580

Alpha = 0.80
Standardized item alpha = 0.80

Equity Followup: From the follow-up data, the twelve items used at baseline to measure extrinsic (tangible and intangible) and intrinsic equity were once again subjected to factor analysis. As with the baseline data, no differences were found between rotational methods or inclusion criteria. The principal components and rotated matrices presented here are based on orthogonal rotation (Varimax) and all sample cases.

Table 4.6.1.4 Equity Items : Total Variance Explained

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	3.784	31533	31.533
2	1.552	12.935	44.468
3	1.423	11.862	56.33
12	0.334	2.787	100

Extraction Method: Principal Component Analysis

Principal component analysis again resulted in three components with an eigenvalue great than one, explaining more than 56% of variance (Table 4.6.1.4). Fours items: *pay reflects stress, pay reflects experience, equity of rewards* and *work too hard for rewards received*, loaded into a reliable construct (Cronbach's alpha = 0.78) designated "extrinsic tangibles" (Table 4.6.1.5). Fours items: *interesting work, sense of accomplishment, extra effort worth the effort*, and *trivial activity,* formed a second reliable construct (Cronbach's alpha = 0.70) designated "intrinsic intangible". The final four items, three dealing with respect from others and appreciation of patients, loaded into a construct designated "extrinsic intangibles".

Table 4.6.1.5 Equity Items - Rotated Component Matrix

Item	Component			Cronbach Alpha
	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	
Compensation fairly reflects experience	0.841			0.78
Compensation fairly reflects stress	0.837			
Work too hard for the rewards received	0.671			
In general the rewards for the work you do	0.635	0.434		
Sense of accomplishment		0.787		0.70
Amount of interesting work		0.744		
Amount of trivial work		0.647		
Extra effort is worth the rewards received	0.421	0.560		
Respect from nurses			0.771	0.58
Respect from administrators			0.726	
Respect from patients			0.588	
Appreciation from patients			0.527	

Rotation Method: Varimax with Kaiser Normalization

A global equity scale was created based on the 12 items used to create the three equity constructs. Of these, the three respect items and the amount of trivial work item were not found to contribute significantly to the construct.[4] The final eight item equity construct, *Overall Equity* (Table 4.6.1.6) had a reliability of 0.81. The same eight items loaded in both the baseline and followup equity construct, and produced almost identical results.

Table 4.6.1.6 Reliability - Overall Equity Construct (8 items)

	Mean if Item Deleted	Scale Variance if Item Deleted	Scale Item-Total Correlation	Corrected Squared Multiple Correlation	Alpha if Item Deleted
WRKINTER	22.6739	20.1334	.3561	.2813	0.8118
PTAPPREC	22.1913	19.0637	.4413	.2423	0.8024
ACCOMPL	22.4783	19.1414	.4820	.3901	0.7976
EXPERIEN	21.7478	17.3772	.5068	.4372	0.7955
WRLTOHRD	21.5174	17.9276	.5414	.3530	0.7888
EXTRAEFF	22.2652	17.4621	.5866	.3867	0.7820
STRESSES	21.3826	16.4556	.6219	.5027	0.7760
REWARDS	22.6913	16.4676	.6800	.4849	0.7664

Alpha = 0.81
Standardized item Alpha = 0.81

[4]The respect/appreciation construct was significantly correlated to the first two equity constructs and the distress scale (see Table 6.4.1, p. 189). Given its conceptual representation of external intangible equity, it was analysed as a separate component of equity using multiple regression analysis and the results are reported in Chapter 6: Follow-up Results. The construct was also included as part of the latent variable, **distributive equity**, in structural equation modelling phase of the analysis.

4.6.2 Distress and Coping

Baseline: Seven items were included in the baseline questionnaire to measure distress and the ability of the physician to cope with time demands. No differences were found between rotational methods (orthogonal vs. oblique) or inclusion criteria (all cases vs. complete cases). The principal components and rotated matrices presented here are based on orthogonal rotation (Varimax) and all sample cases.

Principal component analysis resulted in two components with an eigenvalue great than one, that explained more than 53% of variance (Table 4.6.2.1). Component 1 (Distress) had a reliability of 0.74 and consisted of five items: *fatigued during the day, level of stress, feel rushed, get enough sleep* and *conflict between home and work* (Table 4.6.2.2). Component 2 (Coping) contained two items: *ability to keep up with specialty* and *ability to interact with colleagues.* Due to low level of reliability (less than 50%), these items were tested as separate scales.

Table 4.6.2.1 Distress Measures - Total Variance Explained

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	2.59	36.993	36.993
2	1.143	16.325	53.318
7	0.476	6.797	100

Extraction Method: Principal Component Analysis

Table 4.6.2.2. Distress Measures - Rotated Component Matrix

Item n=374	Component		Cronbach Alpha
	Distress	Coping	
Conflict: Work and Personal	0.717		0.74
Level of Stress	0.714		
Fatigued during the day	0.684		
Feel Rushed	0.674		
Get Enough Sleep	0.656		
Keep Current with Specialty		0.786	0.43
Interact with Colleagues		0.784	

Rotation Method: Varimax with Kaiser Normalization

Followup: The number of items associated with distress and coping was expanded to ten. New items included: *frustration dealing with demanding patients*; *frustration with level of access to services*; and *take time to pursue special interest or hobby.* As with the baseline data, no differences were found between rotational methods or inclusion criteria. The principal components and rotated matrices presented here are based on orthogonal rotation (Varimax) and all sample cases.

Table 4.6.2.3 Distress Measures - Total Variance Explained

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	3.192	35.468	35.463
2	1.481	16.454	51.917
9	0.396	4.395	100

Extraction Method: Principal Component Analysis

Principal component analysis resulted in two components with an eigenvalue great than one, that explained 52% of variance (Table 4.6.2.3). Five items were found to be related to distress (Cronbach's alpha = 0.74) and four items related to time demands (Cronbach's alpha = 0.64)(Table 4.6.2.4). Ability to interact with colleagues had initially loaded within the Coping construct. However, reliability testing indicated that it was not contributing significantly to the construct and it was therefore excluded.

Table 4.6.2.4. Distress Measures - Rotated Component Matrix

Item n = 240	Component		Cronbach Alpha
	Distress	Coping	
Frustration dealing with demanding patients	0.787		0.74
Feel fatigued during the day	0.715		
Frustrated with level of access to services	0.677		
Level of stress	0.634		
Conflict between work and personal	0.516	0.481	
Take time to pursue special interest or hobby		0.731	0.64
Time to keep up with clinical specialty		0.729	
Complete tasks without feeling rushed		0.618	
Get full night's sleep		0.556	

Rotation Method: Varimax with Kaiser Normalization

4.6.3 Wish to Reallocate Time

Physicians have the ability to accurately identify the content of their work (Feldham et al., 1994; Camasso & Camasso, 1994), and Canadian Medical Association (CMA, 1997) routinely asks its members to indicate the time spent on various activities. Therefore, it was deemed feasible to ask physicians participating in this study to indicate

the extent to which they would wish to reallocate their time.

Baseline: Eighteen survey items relating to the four functional areas of medical practice were selected. Each item was coded *zero (no change) or one (do more, do less)* prior to factor analysis. Principal component analysis resulted in six components with an eigenvalue great than one, explaining more than 64% of variance (Table 4.6.3.1).

Table 4.6.3.1 Wish to Reallocate Time: Total Variance Explained

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	4.926	27.367	27.367
2	1.805	10.030	37.397
3	1.459	8.104	45.501
4	1.351	7.507	53.008
5	1.092	6.067	59.074
6	1.022	5.681	64.755
18	0.264	1.465	100

Extraction Method: Principal Component Analysis.

Rotation using Varimax with Kaiser Normalization loaded all 18 items into 6 distinct components (Table 4.6.3.2). The first three components consisted of four items each and produced good reliability scores, with Cronbach alphas in the 0.70 to 0.80 range. Component 1 contained the four items associated with teaching and research. Component 2 contained the four items associated with maintaining knowledge, and Component 3 contained the four items associated with Administration. The six items associated with patient care broke out into three scales of two items each. Component 4

related to communication with patients. Component 5 captured the items relating to teamwork. Component 6 captured items associated with providing care alone and in communicating with other health care providers.

Table 4.6.3.2 Wish to Reallocate Time: Rotated Component Matrix

Item n=358	Component 1	2	3	4	5	6	Cronbach Alpha
DEMONSTR	0.858						0.79
WORKSHP	0.785						
SUPERVIS	0.719						
RESRTEAC	0.647						
PATNTCON		0.765					0.75
CMECRED		0.72					
READJOUR		0.682					
CLINICMT		0.639					
REPORTS			0.742				0.72
PAPERYOU			0.7				
PAPERGRP			0.673				
COMWORK			0.66				
INSTRUCT				0.764			0.79
COUNSEL				0.764			
TEAMLEAD					0.82		0.62
TEAMASST					0.809		
ALONE						0.748	0.34
COMMPLAN						0.658	

Rotation Method: Varimax with Kaiser Normalization.

A number of items within each component were highly correlated, introducing the possibility of reducing the items to improve parsimony. To reduce inter-items correlations and to create a more comprehensive measure of wish to reallocate time, item pairs that were related conceptually and statistically were combined to create 9 time preference couplets: 3 for patient care (solo patient care, team patient care, patient

counselling); 2 for teaching and research (teach, research); 2 for maintaining knowledge (solo education, group education); and 2 for administration (own practice, programs).

Using factor analysis with Eigenvalue extraction and Varimax rotation, two components were produced that explained 49% of variance (Table 4.6.3.3). Seven items loaded into Component 1, and resulted in a Cronbach's alpha of 0.74 (Table 4.6.3.4). Teaching, research and teamwork did not load into the first component. Teaching and research loaded separately (Cronbach's alpha = 0.66). Teamwork was not seen to contribute significantly to explained variance.

Combining all nine items into a single construct (Table 4.6.3.5) resulted in a good reliability score of 0.78. All nine items were found to contribute and none of the inter-item correlations were unusually high (ranged between 0.3 to 0.5). It was concluded that there were three viable time preference constructs at baseline: Component One (Typical Practice); Component Two (Research and Teaching); and the construct created from all nine wish to reallocate time couplets (Overall Time Preference).

Table 4.6.3.3 Wish to Reallocate Time Couplets: Total Variance Explained

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	3.316	36.846	36.846
2	1.135	12.606	49.452
9	0.350	3.890	100.000

Extraction Method: Principal Component Analysis.

Table 4.6.3.4 Wish to Reallocate Time Couplets: Rotated Component Matrix

Component	Component 1	Component 2	Cronbach Alpha
SOLOED	0.726		0.74
PREVTIME	0.700		
GROUPED	0.666		
PAPERWK	0.616		
SOLOTIME	0.596		
ADMIN	0.496	0.402	
TEACH		0.886	0.66
RESEARCH		0.827	
TEAMTIME			-

Rotation Method: Varimax with Kaiser Normalization.

Table 4.6.3.5 Reliability - Overall Wish to Reallocate Time Construct (9 Couplets)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
TEAMTIME	3.5251	12.1604	0.3144	0.1325	0.7802
SOLOTIME	3.2542	11.4170	0.3741	0.1700	0.7745
TEACH	3.3603	11.1275	0.4230	0.3789	0.7682
ADMIN	3.3352	10.8901	0.4893	0.3680	0.7591
RESEARCH	3.3827	10.9932	0.4994	0.4074	0.7581
PAPERWK	3.2737	10.8380	0.5148	0.3812	0.7557
SOLOED	2.8911	9.7668	0.5280	0.3925	0.7548
PREVTIME	3.2989	10.4174	0.5309	0.3247	0.7524
GROUPED	3.2430	10.4702	0.5367	0.3494	0.7517

Alpha = 0.78
Standardized item alpha = 0.78

Follow-up: Although the baseline data had resulted in the creation of distinct components that were linked conceptually to the basic activities of physicians, this

section of the questionnaire had been quite complex. A number of physicians had difficulty completing the section compared to other portions of the questionnaire, and it was concluded that the section would have to be revised prior to the follow-up survey.

Based on the 18 baseline items, ten items relating to the four functional areas of medical practice were developed. The reduced number of items was designed to improve completion of this selection of the questionnaire. To improve sensitivity and to compensate for the smaller number of items, the scale was expanded from three points to five points (Do much more, do more, no change, do less and do much less). Prior to analysis, each item was re-coded as either: zero (no change); one (do more, do less); or two (do much more, do much less).

Factor analysis was carried out on a total of ten items relating to: patient care (6); teaching and research (2); continuing education (2); and administration (2). As with the baseline data, no differences were found between rotational methods or inclusion criteria. Principal component analysis resulted in four components with an eigenvalue great than one, explaining more than 67% of variance (Table 4.6.3.6).

Table 4.6.3.6 Wish to Reallocate Time (Initial): Total Variance Explained

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	2.723	27.225	27.225
2	1.500	15.003	42.228
3	1.291	12.911	55.139
4	1.235	12.347	67.486
10	0.322	3.219	100.000

Extraction Method: Principal Component Analysis

Table 4.6.3.7 Wish to Reallocate Time (Initial): Rotated Component Matrix

Item	Component				Cronbach Alpha
	1	2	3	4	
RESERCH1	0.866				0.68
TEACH1	0.838				
ALONE1	0.558				
READCME1		0.883			0.78
ROUNDS1		0.881			
MEETING1			0.887		0.78
PAPRWRK1			0.872		
COMMUN1				0.765	0.53
TEAM1				0.740	
COUNSEL1				0.543	

Rotation Method: Varimax with Kaiser Normalization.

The four components that were found from the analysis were slightly different from what was expected, based on *a priori* classification and factor analysis of the 18 baseline items. Three items (research, teaching, providing patient care alone) loaded into Component One (the scholarly practitioner) with a reliability of 0.68 (Table 4.6.3.7). Component 2 (the knowledge seeker) consisted of two items (reading journal, clinical rounds). Component 3 (the practice manager) also consisted of 2 items (completing paperwork, meetings and reports). Both Component 2 and Component 3 produced reliability of 0.78. The three remaining items (teamwork, communicating, counseling) made up Component Four (the health team member) with a reliability of 0.53. Unfortunately, combining the ten individual items were not sufficient to create a single wish to reallocate time construct of acceptable reliability. However, the four factors were retained for analysis using structural equation modeling as this would allow inclusion of

these factors into a single latent variable.

To support analysis using multiple linear regression, it was necessary to the development of a reliable wish to reallocate time construct. To do this, the four patient care items were combined to create two patient care couplets. *Treating patients alone* and *counseling* were combined into a new five point scale, *Alone2*. Similarly, *working as part of a team*, and *communicating treatment plans* were combined into the five-point scale, *Team2*. The couplets were then re-coded into two, three point scales designed to match the scaling of the other wish to reallocate time items.

All eight items were re-analysed using factor analysis. Principal component analysis of the reduced number of items (8) resulted in four conceptually strong components with an eigenvalue greater than one, explaining more than 78% of variance (Table 4.6.3.8). Each component contained two items, corresponding to the four functional areas of the physician's practice (Table 4.6.3.9). Reliability was high for three of the four components. Patient care reliability remained low at 0.56.

Table 4.6.3.8 Wish to Reallocate Time (Finalized): Total Variance Explained

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	2.57	32.130	32.130
2	1.425	17.807	49.938
3	1.236	15.450	65.388
4	1.044	13.047	78.435
8	0.324	4.053	100.000

Extraction Method: Principal Component Analysis.

Table 4.6.3.9 Wish to Reallocate Time (Finalized): Rotated Component Matrix

Item	Component 1	2	3	4	Cronbach Alpha
READCME1	0.889				0.78
ROUNDS1	0.888				
RESERCH1		0.892			0.77
TEACH1		0.879			
MEETING1			0.892		0.78
PAPRWRK1			0.879		
TEAM2				0.856	0.56
ALONE2				0.775	

Rotation Method: Varimax with Kaiser Normalization.

Combining the eight items into a single construct (Table 4.6.3.10) resulted in a reliability score of 0.70. All eight items were found to contribute, resulting in a viable overall wish to reallocate time scale suitable for analysis.

Table 4.6.3.10 Reliability - Overall "Wish to Reallocate Time" Construct

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
MEETING1	14.5375	8.7434	0.3313	0.3832	0.6677
TEAM2	13.6042	8.1397	0.3422	0.1735	0.6707
RESERCH1	14.9500	8.8678	0.3830	0.4076	0.6565
PAPRWRK1	14.5500	8.7423	0.3842	0.3893	0.6556
TEACH1	14.9458	8.8966	0.3936	0.4143	0.6548
READCME1	14.5458	8.9100	0.3936	0.4244	0.6549
ROUNDS1	14.6833	8.7445	0.4048	0.4286	0.6517
ALONE2	13.4792	7.8155	0.4274	0.2275	0.6545

Alpha = 0.69
Standardized item Alpha = 0.70

4.7 Analysis

4.7.1 Selecting an Appropriate Multivariate Technique

In selecting the analytical technique to be used to test the models and relationships hypothesized, a number of multivariate statistical techniques were considered, including: canonical correlation, multi-way frequency analysis, analysis of covariance (ANCOVA), multivariate analysis of variance, logistic regression, multiple linear regression (MLR), and structural equation modelling (SEM)

Canonical correlation is designed to analyse the relationship between two sets of variables, one on either side of the equation. The variables on one side are combined to produce a predictive value that produces the highest correlation with the combined variables on the other side of the equation. Canonical correlation is best described as a descriptive or screening technique, rather than a hypothesis testing procedure (Tabachnick & Fidell, 1996). As such, canonical correlation was suitable for this study.

Multi-way frequency analysis is a multivariate technique that is used to analyse the relationships between three or more discrete variables. An extension of multi-way frequency analysis is called log-linear analysis. As a non-parametric statistical technique there are few limitations and no assumptions regarding population distribution. The technique can be applied almost universally, including continuous variables (Tabachnick & Fidell, 1996). However, testing the strength of associations is unavailable from most statistical programs. Given the continuous nature of the main variables in this study and the intention to test hypotheses, this technique was not deemed appropriate.

Analysis of covariance (ANCOVA) is used to determine whether the differences in the value of a dependent variable is significant between groups. ANCOVA is an extension of analysis of variance (ANOVA) and is used for two major purposes. First, to increase sensitivity of the test of the main effects and interactions between categorical variables by reducing the error term. Second, to adjust the mean of the dependent variable to what it would be if all subjects scored equally on a covariate. As a rule, a small number of covariates are used, with a tradeoff being made between maximum adjustment of the mean of the dependent variable, and the loss of degrees of freedom. While ANCOVA can show overall strength of association (r-squared), its main purpose is to establish differences between groups rather than the predictive ability or contribution of independent variables (Tabachnick & Fidell, 1996). Since the main effects of interest are between continuous variables and the categorical variables can be accommodated using dummy variables, this technique was not the most suitable for this project.

Logistic regression is a method of analysis that allows for the prediction of a discrete outcome. Related to discriminant, multi-way frequency, and multiple regression analysis for a dichotomous dependent variable, logistic regression is much more flexible. Logistic regression evaluates the predictability of a particular outcome and does not require a dichotomous or sequential dependent variable. Particularly useful when the distribution of the dependent variable is expected to be non-linear, logistic regression is capable of analysing a variety of independent variables including: continuous, sequential, categorical and dichotomous variables (Tabachnick & Fidell, 1996). Given the linear relationship between the dependent variable(s) and the independent variables (established

using curve estimation) and the normal distribution of the variables, logistic regression, although attractive, was not suitable.

Multiple linear regression (MLR) analysis is a set of techniques that allow one to assess the relationship between a single dependent variable and two or more independent variables. MLR is particularly useful in addressing real world and complex problems not amenable to the laboratory setting. Regression techniques include standard, sequential (Hierarchical) and statistical (Step-wise) regression, depending on the manner in which variables are entered into the equation. Regression allows for the uses of both continuous and dichotomous variables. Discrete or categorical variables can be used, provided they are first converted to a series of dichotomous (dummy) variables. The limitations of regression are that it cannot imply causality; which is established by logic and experimentation, rather than statistical association. Another concern is that appropriate selection of variables requires a strong theoretical foundation (Tabachnick & Fidell, 1996). In this study, multiple regression was used to establish a foundation from which to apply carry out more sophisticated analysis using structural equation modelling.

Structural equation modelling (SEM) allows for the examination of a set of relationships between one or more independent variables and one or more dependent variables. and may be thought of as a combination of exploratory factor analysis and multiple regression (Tabachnick & Fidell, 1996). The variables may be continuous, ordinal or categorical and may be either factors or measured variables. The advantages offered by SEM include: 1) examined relationships are based on common variance and are free from error; 2) reliability is accounted for explicitly due to the removal of error;

and 3) it is the only form of analysis that allows *complete* and *simultaneous* testing of all the relevant relationships.

4.7.2 Testing Wish to Reallocate Time-Distress-Equity Models

Multiple linear regression (MLR) and structural equation modelling (SEM) were selected to examine the relationship between the variables in this study. MLR is appropriate for examining the relationship between a single dependent variable and two or more independent and control variables (DeJong & Branch, 1982). Classical multiple regression requires all independent variables to be continuous. In practical terms, however, any type can be used (Kleinbaum et al., 1987). Discrete dichotomous variables can be used as reported. Discrete variables with three or more categories can be converted to a series of dummy variables. Ordinal data can be treated as continuous data provided the distribution of responses follows a normal distribution. Where necessary, recoding may be used to ensure normal distribution (Tabachnick & Fidell, 1996).

The analytical plan used to evaluate the hypotheses was as follows:

I. Descriptive statistics for individual items and constructs. Statistics were reported for both baseline and follow-up and included: mean, median, standard deviation, minimum and maximum value, skewing and kurtosis value and error. Dummy variables were created for categorical variables to be analysed using linear regression and structural equation modelling. This was done by changing multiple-level categorical variables into a series of two-level variables. Reclassification of categorical data was considered in order to maintain cell sizes adequate for analysis. Recoding of skewed ordinal data will be

carried out to better reflect underlying normal distribution curves;

2. *Zero-order correlation matrices to identify important relationships* ($p<0.05$) between each dependent variable and individual independent and control variables were conducted at baseline and at follow-up;

3. *Simple linear regression to establish the significance of the relationships* between the dependent variable and all important independent and control variables; and hierarchical (forced entry) regression to evaluation the nature of the relationship between variables at each stage of the hypothesized model. Forced entry allowed loading of all immutable control variables and significant mutable control variables into the three stages of the model prior to entering significant independent variables;

4. *SEM was used to develop a comprehensive model of the pathways* suggested by multiple linear regression models and was carried out on the follow-up data only. The baseline data were essential to the development of valid and reliable measures, and while pathways could be hypothesized and examined from both baseline and follow-up data, the follow-up data represented an advance in conceptual development. The resulting changes in the survey instrument allowed for a more comprehensive examination of these concepts using SEM.

In applying SEM, the specification of the proposed multistage model was followed by model estimation, evaluation of fit and possible modification to improve fit. A model was judged adequate if it produced parameter estimates that were close to the sample covariance matrix. Closeness-of-fit was evaluated primarily by chi-square tests and fit indices (Tabachnick & Fidell, 1996). As suggested by Arbuckle & Wothke (1999),

a variety of fit indices (both sample-dependent and independent of sample size) were used to establish the adequacy of the proposed model.

Also reported were the Normed Fit Index (NFI); the Incremental Fit Index (IFI); the Parsimony Ratio; the Population Discrepancy Function (F0 Statistics); the Root Mean Square Error of Approximation (RMSEA Statistics), P for Test for Close Fit; and the Hoelter 0.05 Index. Good fit is indicated when the reported value approaches one for the NFI, the IFI, and P for Test for Close Fit. The Parsimony Ratio is a relative value with parsimony seen to be improving as the value moves from one to zero. However, no absolute cut-off value is suggested. The F_0 statistic indicates a better fit closer to zero. The RMSEA and the SRMR are acceptable if less than 0.05. The Hoelter 0.05 Index indicate the total number of cases required to find a significant p-value for chi-square (Arbuckle & Wothke, 1999; Kline, 1998; Maruyama, 1998).

4.7.3 Calculating Minimum Sample Size in Multiple Linear Regression

The minimum sample recommended for structural equation modelling is 200 and both the baseline and followup samples were sufficient for analysis. The appropriate sample size (N) for multiple regression depends on the necessary power required (level of Type II error), specified alpha (Type I error), the number of predictors (m) and the expected effect size (Tabachnick & Fidell, 1996).

$$N \geq 50 + 8m \text{ (multiple predictors)}$$

$$N \geq 104 + m \text{ (individual predictors)}$$

Assuming a medium multiple effect size between the dependent and the independent variables, an alpha of 0.05, and power (1- β) of 0.80, and 6 predictors (m).

$$N \geq 50 + 8(6) = 98$$

$$N \geq 104 + 6 = 110$$

A higher number of cases will be required if the dependent variable is skewed, a smaller effect size is anticipated, or substantial measurement error is expected from unreliable variables. Initial evaluation of the constructs indicated no significant skewing and reliability was found to be good. Therefore, it is expected that a larger sample may be required only if the strength of the relationship is less than medium.

Green (1991) offers a method for calculating a range of effects:

$$N \geq (8/f^2) + (m-1) \qquad f^2 = R^2/(1-R^2)$$

To determine the range required to ensure the findings are meaningful, sample size calculations were made for correlations (R) of 0.10, 0.20 and 0.30 (Table 4.7). Based on these calculations, the number of cases available were sufficient to capture small effects likely to contribute to the models being tested.

Table 4.7 Sample Size Calculations

R	0.1	0.2	0.3
R^2	0.01	0.04	0.09
f^2	0.01	0.04	0.1
m	6	6	6
N≥	805	205	85

4.7.4 Missing Data

The number of data points missing from the follow-up data used in regression analysis and model construction was relatively small, and the sample relatively large (n = 385 at baseline and n = 240 at followup), suggesting cases with missing data could be excluded from the analysis. Due to the large number of variables being tested, the presence of even a few missing data randomly dispersed among the respondents could substantially affect the size of the sample available for analysis.

One option was to substitute the overall item mean for missing data to allow analysis of the entire sample. However, the pattern of missing data is even more important than the amount missing (Tabachnick & Fidell, 1996). To determine if the missing data was of a random nature, analysis was carried out for each dependent variable comparing cases of responders to non-responders. No significant differences were observed for variables significantly correlated with the main pathway variables: equity, distress and wish to reallocate time. The preliminary stepwise analysis was carried out, using the "replace missing data" command to allow all cases to be included. In the forced regression stage of analysis, only complete cases were used and reported in the results.

A somewhat different approach was taken with structural equation modelling (SEM). Because the number of cases must be at least 200, all cases (240) were included in the analysis, with the SEM program configured to calculate for missing data points (Arbuckle & Wothke, 1999).

4.8 Limitations

To ensure an adequate rate of response, the length of the survey instrument and the detail of the survey questions were limited. The length of the baseline questionnaire was a concern, but pre-testing indicated that it could be completed comfortably in 15 minutes and was not perceived as too onerous. Although less than half of the physicians surveyed returned a completed baseline questionnaire, the response rate (46%) was similar to that achieved by the CMA, SMA and the BCMA. Response bias was not evident based on gender, speciality or provincial jurisdiction.

While model pathways using baseline data might be established and compared with the follow-up data using the analysis proposed, substantive changes made to *wish to reallocate time* in the follow-up questionnaire make it difficult to compare the baseline and follow-up data with any degree of certainty. Although relationships established with the baseline data appeared to be replicated by the revised follow-up measures, any changes found in *wish to reallocate time* between baseline and follow-up might easily be the result of changes in scaling and only represent a statistical artifact rather than a change in the wish to reallocate time.

4.9 Ethics Approval and Participation

The approval of the survey instrument and its use in collecting information from the selected Saskatchewan and British Columbia physicians was received from the University of Saskatchewan Advisory Committee on Ethics in Behavioural Sciences. Participants were assured that the information they were providing would be held in

strictest confidence and the data would not be presented in a manner that would allow the identification of individual physicians. The physicians were also assured that their participation was completely voluntary and that they could withdraw at anytime without penalty.

5.0 Baseline Results

The findings were divided into baseline and follow-up results, with the emphasis on follow-up results, since these were supported by refined measures. The baseline results report descriptive statistics and zero-order correlations only.

5.1 Descriptive Statistics at Baseline

Descriptive statistics were run for all selected variables. Statistics collected for continuous and ordinal scales included: item mean, standard deviation, sample size, minimum and maximum scale values, and measures of skewness and kurtosis to assess normal distribution of data. For categorical data, descriptive statistics reported the percentage of total response attributed to each category heading. Data were reported for the dependent variable constructs: wish to reallocate time, distress and equity, the independent practice condition variables, and the control variables.

5.1.1 Wish to Reallocate Time, Distress, and Equity at Baseline

Among the dependent variables (Table 5.1.1), slight skewing was observed in two of the wish to reallocate time measures: the 6 item scale, with an activity focus on patient care, maintaining knowledge, and administration; and the 9 item scale (adding teaching, research and team-based activities). More significant skewing was observed with the 2

item scale (teaching and research) and the 1item scale (teamwork). This made it necessary to rescale the 2 item and 1 item scales to create dichotomous measures. All four wish to reallocate time measures showed a tendency by physicians to indicate *no change* in the wish to reallocate their professional time. The distress construct produced a very acceptable distribution curve with minimal skewing or kurtosis. All four equity constructs produced normal distribution curves.

Table 5.1.1 Description of Wish to Reallocate Time, Distress and Equity (Baseline)

Constructs	Values and variable distributions			Percent
Wish to Reallocate Time				
9 item Scale (n=358)	Mean = 3.70 SD = 3.66	Min = 0 Max =18	Skewness = 0.998 Kurtosis = 0.667	
6 item Scale (n=358)	Mean = 2.88 SD = 2.88	Min = 0 Max =12	Skewness = 0.857 Kurtosis =-0.001	
2 item Scale (n=358)	1= No Change Allocation 2= Change in Allocation			68.2 31.8
1 item Scale (n=358)	1= No Change in Allocation 2= Change in Allocation			87.2 12.8
Distress				
Distress (n=372)	Mean = 16.87 SD = 3.00	Min = 7 Max = 25	Skewness = -0.009 Kurtosis = 0.245	
Equity				
Extrinsic Tangible (n=375)	Mean = 14.40 SD = 3.15	Min = 4 Max = 22	Skewness = -0.305 Kurtosis = -0.113	
Intrinsic Intangible (n=358)	Mean = 11.30 SD = 2.36	Min = 4 Max = 19	Skewness = 0.043 Kurtosis = 0.313	
Extrinsic Intangible (n=366)	Mean = 9.33 SD = 1.65	Min = 4 Max = 14	Skewness = 0.001 Kurtosis = 0.393	
Equity (n=357)	Mean = 25.73 SD = 4.79	Min = 12 Max = 38	Skewness = -0.236 Kurtosis = -0.170	

5.1.2 Practice Conditions at Baseline

In general, the physicians in this study came from relatively large communities, with 53.5 percent coming from communities with populations of more than 100,000 (Table 5.1.2.1). Just under 18 percent came from very large centres (500,000 or more) and approximately 20 percent came from communities of less than 25,000.

Practice groups of one or two physicians constituted the largest single group, representing 41.8 percent of physicians, with groups of more than eight physicians representing the second largest (23.4 percent). At baseline, the distribution of specialty reflected the original sampling frame with a fairly even split between general practitioners and specialists, although there were somewhat fewer general practitioners.

Table 5.1.2.1 Description of Practice Environment Variables (Baseline)

Description	Values and variable distributions	Percent
Community Size (n=377)	1 = less than 25,000	19.6
	2 = 25,000 to 99,999	26.8
	3 = 100,000 to 499,999	35.8
	4 = 500,000+	17.7
Size of Practice Group (n=377)	1 = 1 or 2 physicians	41.8
	2 = 3 or 4 physicians	17.3
	3 = 5 to 7 physicians	17.5
	4 = 8 or more physicians	23.4
Specialty Area (n=385)	1 = Family Practice/General Medicine	47.3
	2 = Cognitive (pediatrics, internal medicine, psychiatry, ophthalmology and otolaryngology)	24.4 12.2
	3 = Procedural (surgery, Ob. & Gyn., etc)	16.1
	4 = Technical (radiology, anaesthesia, pathology)	
Location of Office (n=375)	1 = Community	71.2
	2 = Hospital	28.8
Sponsorship (n=356)	1 = Physician	51.4
	2 = Other	48.6

The vast majority of physicians (71.2 percent) indicated that their primary office was located in the community, with 28.8 percent indicating the hospital as the location of the principal office. Practice sponsorship was fairly evenly divided between those sponsored by physicians (48.6 percent) and those sponsored by a third party, such as a health district, community clinic, or hospital.

Table 5.1.2.2 Description of Local Health Care System Variables (Baseline)

Description	Values and variable distributions		
Quality of Health Care (n = 383)	Mean = 2.39 SD= 0.67	Min. value = 1 Max value = 4	Skewness = 0.303 Kurtosis = -0.034
Efficiency of Health Care (n = 380)	Mean = 3.07 SD= 0.74	Min. value = 1 Max value = 5	Skewness = 0.215 Kurtosis = 0.712
Access to Community Services (n = 382)	Mean = 2.76 SD= 0.73	Min. value = 1 Max value = 5	Skewness =-0.004 Kurtosis = 0.216
Access to Hospital Services (n = 382)	Mean = 2.89 SD= 0.86	Min. value = 1 Max value = 5	Skewness = 0.233 Kurtosis = 0.158
Access to Long Term Services (n = 381)	Mean = 3.43 SD= 0.90	Min. value = 1 Max value = 5	Skewness = 0.078 Kurtosis =-0.645
Cooperation Among Health Providers (n = 380)	Mean = 2.53 SD= 0.75	Min. value = 1 Max value = 5	Skewness =-0.015 Kurtosis = 0.275
Participation in Policy and Planning (n = 382)	Mean = 3.51 SD= 0.85	Min. value = 1 Max value = 5	Skewness = 0.014 Kurtosis =-0.226
Quality of Community Services (n = 384)	Mean = 2.45 SD= 0.78	Min. value = 1 Max value = 5	Skewness = 0.580 Kurtosis = 0.603
Quality of Hospital Services (n = 384)	Mean = 2.37 SD= 0.88	Min. value = 1 Max value =	Skewness = 0.685 Kurtosis = 0.532
Quality of Long Term Services (n = 383)	Mean = 2.69 SD= 0.94	Min. value = 1 Max value = 5	Skewness = 0.420 Kurtosis =-0.201

In assessing the state of their local health care system (Table 5.1.2.2), physicians tended to rate the overall quality of their system as fair to good (mean = 2.40), while

rating the efficiency of the system somewhat lower (mean = 3.01). In specific service areas, physicians rated access to community and hospital services at a similar level (means of 2.76 and 2.89 respectively), while access term care was rated between fair and poor (mean of 3.43). No such discrepancy was evident with the quality of care measures. On average, the quality of all three service areas (community-based, hospital, long term) were rated between fair and good. With regard to cooperation and participation, physicians tended to indicate fair to good co-operation between health care providers, but only poor to fair levels of participation by physicians in local policy and planning activities. The ten health system scales produced only minor skewing or kurtosis.

When asked to comment on the organization of their practice, a large percent of physicians (43.5 percent) indicated some form of cost sharing arrangement (Table 5.1.2.3). Revenue sharing or some other type of revenue pooling accounted for 30.1 percent of physicians, while solo or individual practice accounted for 26.4 percent of physicians. Two-thirds of physicians indicated that they shared medical records.

Table 5.1.2.3 Description of Practice Integration Variables (Baseline)

Description	Values and variable distributions	Percent
Arrangement (n=375)	1 = solo/individual practice 2 = share practice expense 3 = revenue sharing/other	26.4 43.5 30.1
Share Records (n=348)	1 = Yes 2 = No	66.1 33.9

On average, physicians indicated that they worked just under 50 hours per week (excluding on call), ranging from 5 to 95 hours (Table 5.1.2.4). Physicians also indicated their *share of difficult patients* compared to other physicians to be between high and moderate (mean = 2.69). *Keep current with specialty* and *interact with colleagues* indicated normal distribution with minimal skewing or kurtosis.

Table 5.1.2.4 Description of Practice Demands Variables (Baseline)

Description	Values and variable distributions		
Hours Worked (n = 273)	Mean = 49.5 SD =13.7	Min. value = 5 Max value = 98	Skewness = -0.131 Kurtosis = 0.775
Difficult Patients (n = 363)	Mean = 2.69 SD = 0.84	Min. value = 1 Max value = 5	Skewness = -0.070 Kurtosis = 0.170
Keep current with specialty (n = 377)	Mean = 2.94 SD = 0.80	Min. value = 1 Max value = 5	Skewness = 0.014 Kurtosis = 0.105
Interact with colleagues (n = 377)	Mean = 2.85 SD = 0.93	Min. value = 1 Max value = 5	Skewness = 0.331 Kurtosis = -0.306

Physicians were asked to indicate the amount of reimbursement that came from fee-for-service, salary, capitated payments, sessional contract, or other. Just over 70% indicated that fee-for-service made up more than 80% of their income (Table 5.1.2.5).

Table 5.1.2.5 Description of Remuneration Variables (Baseline)

Description	Values and variable distributions			Percent
Method of Pay (n=383)	1 = Greater than 80% FFS 2 = Up to 80% FFS			71.0 29.0
Process* (n = 375)	Mean = 1.95 SD = 0.73	Min value = 1 Max value = 3	Skewness = 0.075 Kurtosis = -1.133	

* Re-scaled due to skewing

The original measure of *process used to determine remuneration fairly reflects all areas of specialization* was a five point Likert scale (strongly agree to strongly disagree), but the results were too skewed to be properly analysed. The item was re-scaled as a 3 point scale to reduce skewing and renamed PROCESS (Table 5.1.2.5).

5.1.3 Control Variables at Baseline

The distribution of respondents reflected the original sampling frame with a fairly even split based on gender, although there were somewhat fewer female physicians (Table 5.1.3). Female physicians made up 48.8 percent of the sample and general practitioners accounted for 47.3 percent of respondents. Physicians ranged in age between 29 and 69 years with an average age of 45 years. The vast majority of physicians (84.9 percent) indicated that they were married or living in a common law relationship. Nearly 40 percent of physicians indicated that there were no children living at home. The average number of years in practice was 16 years with a range of 1 to 45 years.

Table 5.1.3 Description of Control Variables (Baseline)

Description	Values and variable distributions			%
Gender (n=385)	1 = female 2 = male			48.8 51.2
Age (years) (n=377)	Mean = 45.0 SD = 8.9	Min. value = 29 Max value = 69	Skew = 0.269 Kurtosis = -0.700	
Spouse/partner (n=382)	1 = no 2 =yes			14.3 84.9
Children in the home (Less than 18 yoa.) (n=381)	1 = none 2 = one to two 3 = three or more			39.9 39.1 21.0
Years of Practice (n=376)	Mean = 15.9 SD = 9.9	Min. value = 1 Max value = 45	Skew = 0.429 Kurtosis = -0.656	

5.2 Zero-order correlations at Baseline

5.2.1 Dependent Variables at Baseline

Significant correlations were found between two of the wish to reallocate time (WRT) scales (9 item and 6 item), and the equity and distress measures (Table 5.2.1). The highest correlations were between: the nine item WRT scale and distress (R = 0.281); the six item WRT scale and distress (R = 0.296); and between distress and equity (R = 0.407). Strong correlations were also observed between distress and equity (overall), extrinsic-tangible equity and intrinsic equity. A significant but somewhat weaker correlation was observed between distress and extrinsic-intangible equity. No significant correlations were found between distress or equity and the dichotomized WRT scales (teaching and research or teamwork). Given the lack of a significant relation with neither distress nor equity, these two time allocation scales were dropped from further analysis.

Table 5.2.1 Correlations Between Dependent Variables (Baseline)

Variable	Distress	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	Equity (Overall)
Wish to Reallocate Time (9 items)	0.281***	0.168**	NS	0.113*	0.162**
Wish to Reallocate Time (6 items)	0.296***	0.207***	0.122*	0.112*	0.202***
Wish to Reallocate Time (R&T)	NS	NS	NS	NS	NS
Wish to Reallocate Time (Teamwork)	NS	NS	NS	NS	NS
Distress	-	0.372***	0.330***	0.150**	0.407***

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

5.2.2 Dependent and Practice Condition Variables at Baseline

Wish to Reallocate Time (6 item scale): Variables relating to the practice environment correlated significantly with the wish to reallocate time (Table 5.2.2). Physicians with offices located in the community, practices sponsored by physicians, and physicians practising in very large groups indicated a greater desire to reallocate their time ($p < 0.05$). Practice groups of 5 to 7 physicians were more likely to indicate less desire to reallocate their time compared to other physicians ($p < 0.05$). Cognitive specialists were more likely to indicate a preference to reallocate time ($p < 0.05$), while technical specialists were less likely compared to other groups of physicians ($p < 0.01$).

Physicians working in practices with cost sharing arrangements were more likely to indicate a greater wish to reallocate time than other physicians. Physicians working in a revenue sharing or some other type of revenue pooling arrangement, on the other hand, tended to report less of a wish to reallocate time. Those physicians reporting more difficult patients compared to their colleagues, those unable to keep current with their specialty, and those finding the process used to determine income to be unfair also tended to indicate a greater wish to reallocate their time.

Wish to Reallocate Time (9 item scale): Including teaching, research and teamwork items in the wish to reallocate time construct produced correlations that were similar to the six item scale. Physicians practising in very large groups indicated a greater desire to reallocate their time, while practice groups of 5 to 7 physicians were more likely to indicate less desire to reallocate their time compared to other physicians. Like the 6 item scale, cognitive specialists were more likely to indicate a wish to

reallocate time, while technical specialists were less likely compared to other groups of physicians. Unlike the 6 item scale, no significant correlations were observed between wish to reallocate time (9 items) and office location, or between wish to reallocate time and practice sponsorship.

Physicians working in practices with cost sharing arrangements were more likely to indicate a greater wish to reallocate time than other physicians. No significant correlations were seen for physicians working in a revenue sharing or some other type of revenue pooling arrangement. Those physicians working longer hours (excluding on call), reporting more difficult patients compared to their colleagues, those unable to keep current with their specialty, and those finding the process used to determine income to be unfair, also tended to indicate a greater wish to reallocate their time.

Distress: Variables relating to the practice environment did not correlate significantly with distress. Physicians working in practices with cost sharing arrangements and paid primarily by fee-for-service experienced greater distress than other physicians. Physicians working in solo or individual practice on the other hand, tended to report lower levels of distress. Those physicians reporting more difficult patients compared to their colleagues, those unable to keep current, those not interacting with colleagues, and those finding the process used to determine income to be unfair, also tended to experience more distress.

Table 5.2.2 Zero-order Correlations Between Dependent and Practice Conditions

Practice Variable	WRT6	WRT9	Distress	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	Equity
	Practice Environment						
Community Size							
> 500,000	-	-	-	-	-0.125*	-	-
Office Location	-0.118*	-	-	-0.105*	-	-	-
Sponsorship	-0.139*	-	-	-0.105*	-	-	-
Specialty							
Cognitive	0.126*	0.157**	-	-	-	-	-
Technical	-0.176**	-0.186**	-	-	-	-	-
Size of Group							
1 or 2 MDs	-	-	-	0.121*	-	-	-
3 to 4 MDs	-	-	-	-	-	0.121*	-
5 to 7 MDs	0.190**	0.197***	-	-	-	-	-
> 7 MDs	-0.122*	-0.126*	-	-0.129*	-	-	-
	Practice Integration						
Arrangement							
Individual/Solo	-	-	-0.114*	-	-	-	-
Share Costs	0.140**	00.145**	0.131*	0.127*	-	-	0.133*
Revenue/Other	-0.110*	-	-	-0.199***	-	-	-0.182**
Share Records	-	-	-	0.150**	-	-	-
	Practice Demands						
Reg. Work Hours	-	0.122*	-	-	-	0.145*	-
Difficult Patients	-0.199***	-0.204***	-0.229***	-0.203***	-	-	-0.144**
Keep Current	0.192***	0.136*	0.218***	0.120*	0.219***	-	0.194***
Interacting	-	-	0.190***	-	0.195***	-	0.168**
	Remuneration						
Method of Pay	-	-	-0.130*	-0.162**	-	-	-0.141**
Process	0.150**	0.149**	0.236***	0.373***	0.210***	0.202***	0.362***

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Extrinsic Tangible Equity: Having the office located in a hospital, non-physician sponsorship, and being part of a large practice group (more than 7 physicians) were associated higher levels of extrinsic tangible equity, while groups of 1 or 2 physicians tended to perceive less equity than other groups. Those physicians working in practices with cost sharing arrangements perceived less equity, while those participating in revenue sharing and other forms of revenue pooling perceived higher levels of equity. Physicians sharing medical records also reported higher levels of extrinsic tangible equity (i.e. level of income was perceived as fair).

Those physicians reporting fewer difficult patients compared to their colleagues and those able to keep current with specialty also tended to report a higher level of extrinsic tangible equity. Those physicians paid by salary or mix method (up to 80% fee-for-service), and those finding the process used to determine income to be fair, also tended to report a higher level of extrinsic tangible equity.

Intrinsic Intangible Equity: Physician working in very large communities also tended to experience greater intrinsic equity. Physicians able to keep current, those interacting with colleagues, and those who found the process used to determine income to be fair also tended to report a higher level of intrinsic equity.

Extrinsic Intangible Equity: Physician working in groups of 3 to 4 physicians tended to experience less extrinsic intangible equity. Physician working fewer hours and those finding the process used to determine income to be fair indicated greater extrinsic intangible equity.

Equity (Overall): Variables relating to the practice environment (excluding the local health system items) did not correlate significantly with the overall equity construct. Those physicians working in practices with cost sharing arrangements perceived less equity, while those participating in revenue sharing and other forms of revenue pooling perceived higher levels of equity. Those physicians reporting fewer difficult patients compared to their colleagues, those able to keep current, and those able to interact with colleagues, tended to report a higher level of extrinsic tangible equity. Those paid by salary or mixed method (up to 80% FFS), and those finding the process used to determine income to be fair reported higher levels of extrinsic tangible equity (i.e. level of income was perceived as fair).

5.2.3 Dependent and Local Health System Variables at Baseline

Few significant correlations were found between the wish to reallocate time and the local health care system variables, or between the distress and the local health care system variables (Table 5.2.3). By contrast, significant correlations were almost universally seen between the four equity constructs and the health system variables.

Access to community services, access to long term care services, and the quality of community services correlated weakly with the wish to reallocate time (6 item scale), and only one variable, quality of community services, correlated with the wish to reallocate time (9 item scale). Distress was significantly but weakly correlated with access to community services and access to long term care services.

With the exception of cooperation and extrinsic-tangible equity, all correlations between equity and health variables were significant ($p < 0.05$) and a substantial number were highly significant ($p < 0.000$; $r > 0.200$). Among the more substantial correlations were: extrinsic tangible and access to long term care; intrinsic equity and efficiency, access to community services, cooperation, and quality of community services; extrinsic intangible equity and cooperation; and equity (overall) and efficiency, access to community and long term services, and quality of community services.

Table 5.2.3 Zero-order Correlations Between Dependent and Health System Variables

Practice Variable	WRT6	WRT9	Distress	Extrinsic Tangible	Intrinsic	Extrinsic Intang.	Equity
Quality of System	-	-	-	0.129*	0.151**	0.119*	0.155**
Efficiency of System	-	-	-	0.188**	0.209***	0.135**	0.221***
Access to Community Services	0.128*	-	0.119*	0.171**	0.201***	0.127**	0.211***
Access to Hospital Services	-	-	-	0.167**	0.138**	0.127*	0.182**
Access to Long Term Services	0.123*	-	0.162**	0.246***	0.196***	0.179**	0.250***
Cooperation Among Health Providers	-	-	-	-	0.253***	0.258***	0.182**
Participation in Policy and Planning	-	-	-	0.134*	0.187***	0.126*	0.195***
Quality of Community Services	0.129*	0.125*	-	0.158**	0.231***	0.161**	0.217***
Quality of Hospital Services	-	-	-	0.116*	0.146**	0.150**	0.154**
Quality of Long Term Services	-	-	-	0.167**	0.173**	0.145**	0.193***

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

5.2.4 Dependent and Control Variables at Baseline

A number of significant correlations were found between the wish to reallocate time and the control variables (Table 5.2.4.). The age of the physician and years of practice were inversely correlated with both *wish to reallocate time* constructs, indicating a greater wish to reallocate time among younger and less experienced physicians. Physicians did not differ in their wish to reallocate time based on gender, marital status, or having children at home.

Table 5.2.4 Significant Correlations Between Dependent and Control Variables

Practice Variable	WRT6	WRT9	Distress	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	Equity
Gender	-	-	-0.177**	-	-	-0.112*	-
Age (years)	-0.200***	-0.232***	-0.216***	-	-	-	-
Spouse/partner	-	-	-	-	-	-	-
Children at Home							
1 = None	-	-	-0.187***	-	0.116*	-	-
1 = 1 or 2	-	-	0.151**	-	-	-	-
1 =2 or More	-	-	-	-	-	-0.140**	-
Years of Practice	-0.159**	-0.232***	-0.198***	-	-	-	-

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Distress (the 5 item construct) was significantly correlated with a number of control variables. Female physicians, younger physicians, those physicians with one or two children at home, and those with fewer years of practice reported greater levels of distress compared to male physicians, older physicians, those with no children living at

home and those physicians with more years of practice.

Few significant correlations were found between the equity scales and the control variables. Physicians with no children tended to report somewhat less intrinsic equity than those physicians with children at home. The number of children at home was also related to intangible extrinsic equity, with physicians having more than two children at home reporting greater equity. Male physicians were also more likely to report greater intangible extrinsic equity than their female counterparts. No significant correlations were seen between the control variables and extrinsic tangible equity, or between the control variables and overall equity.

6.0 Follow-up Results

The follow-up results included descriptive statistics, zero-order correlations, multiple linear regression (MLR), and structural equation modelling (SEM). Descriptive statistics were generated to assess the quality of the data and the distribution patterns of constructs and individual survey items. Zero-order correlations were run to identify significant relationships between variables, including the constructs measuring: *wish to reallocate time*; *distress*; and *equity*, as well as practice condition variables and control variables. Regression analysis was used to establish simple linear models of the factors contributing to *equity*, *distress* and the *wish to reallocate time*, to create the basis for constructing a multistage model. Based on significant relationships established by linear regression and the constructs identified by factor analysis as reported in Chapter 4, SEM was used to build and test a hypothesized multistage model (recall Figure 5, page 86).

6.1 Descriptive Statistics at Follow-up

Descriptive statistics reported for continuous and ordinal scales included: item mean, standard deviation, sample size, minimum and maximum scale values, and measures of skewness and kurtosis to assess normal distribution of data. For categorical data, descriptive statistics reported the percentage of total response attributed to each category heading. Statistics were reported for the dependent variables (*equity, distress,*

wish to reallocate time), independent variables (practice conditions) and control variables.

6.1.1 Wish-to-Reallocate-Time, Distress and Equity at Follow-up

Among the dependent variables (Table 6.1.1), slight skewing was observed in *wish-to-reallocate-time* (unweighted). Weighting the responses based on the proportion of time spent on the four main professional activities: patient care, teaching & teaching, maintaining knowledge and administration, resulted in a measure with an improved distribution curve. Although reliability was somewhat reduced compared to the base-line construct (Cronbach's alpha of 0.78 vs. 0.70), the *wish-to-reallocate-time* (WRT) measures at follow-up displayed a much better distribution of responses.

The additional items added to the *distress* measure did not affect skewness or kurtosis. The new construct consisted of five items measuring: frustration with patients; frustration with access; fatigue during the day; stress; and time conflicts. The scale produced a very acceptable distribution curve with minimal skewing or kurtosis.

Three of the four *equity* constructs at follow-up produced normal distribution curves with a centring around the median and only slight skewing and kurtosis. Only extrinsic-intangible equity displayed some kurtosis, with responses tending to cluster around the mean. The aggregate *equity* scale drew on items from all three sub-scales: all 4 items from *tangible-extrinsic equity* scale, 3 of 4 items from the *intrinsic equity* scale, and 1 of 4 items from the *extrinsic-intangible* equity scale.

Table 6.1.1 Description of Wish-to-Reallocate-Time, Distress and Equity Measures

Description	Values and variable distributions		
Wish-to-Reallocate-Time			
Activities Unweighted (n=240)	Mean = 16.47 SD = 3.28	Min = 10 Max = 30	Skewness = 0.458 Kurtosis = 0.681
Activities Weighted (n=238)	Mean = 18.15 SD = 4.06	Min = 10 Max = 30	Skewness = 0.139 Kurtosis = -0.238
Distress			
Distress (n=237)	Mean = 17.92 SD = 3.13	Min = 8 Max = 25	Skewness = -0.170 Kurtosis = 0.132
Equity			
Extrinsic Tangible (n=237)	Mean = 13.75 SD = 3.13	Min = 6 Max = 20	Skewness = -0.207 Kurtosis = -0.501
Intrinsic Intangible (n=237)	Mean = 11.49 SD = 2.36	Min = 6 Max = 19	Skewness = 0.173 Kurtosis = 0.030
Extrinsic Intangible (n=235)	Mean = 12.30 SD = 2.07	Min = 6 Max = 20	Skewness = 0.113 Kurtosis = 0.747
Equity (n=235)	Mean = 25.29 SD = 4.76	Min = 12 Max = 39	Skewness = -0.089 Kurtosis = -0.069

6.1.2 Practice Conditions at Follow-up

In general, the physicians responding to the survey practised in relatively large communities, with 54 percent coming from communities with populations of more than 100,000 (Table 6.1.2.1a). Just over 18 percent came from a very large centre (Vancouver), and approximately 19 percent came from communities of less than 25,000. The vast majority of physicians (70.4 percent) indicated that their primary office was located in the community-at-large, with 29.6 percent indicating the hospital as the location of the principal office.

Table 6.1.2.1a Description of Practice Environment Variables (Follow-up)

Description	Values and variable distributions	%
Community Size (n=235)	1 = less than 25,000	18.7
	2 = 25,000 to 99,999	27.2
	3 = 100,000 to 499,999	35.7
	4 = 500,000+	18.3
Location of Office (n=236)	1 = Community	71.8
	2 = Hospital	28.2
Sponsorship (n=221)	1 = Physician	51.6
	2 = Other	48.4
Specialty (n=239)	1 = Family Practice/General Medicine	44.6
	2 = Cognitive (pediatrics, internal medicine, psychiatry, ophthalmology and otolaryngology)	23.0
		14.2
	3 = Procedural (surgery, Ob. & Gyn., etc)	17.2
	4 = Technical (radiology, anaesthesia, pathology)	
Size of Practice Group (n=236)	1 = 1 or 2 physicians	30.1
	2 = 3 or 4 physicians	23.3
	3 = 5 to 7 physicians	20.3
	4 = 8 or more physicians	26.3

Practice sponsorship was fairly evenly divided between those sponsored by physicians (51.6 percent) and those sponsored by a third party, such as a health district, community clinic, or hospital. At follow-up, the distribution of respondents based on specialty reflected the baseline sampling frame with a fairly even split, although there were somewhat fewer general practitioners (44.6 percent of respondents).

Practice groups of one or two physicians constituted the largest single group, representing 30.1 percent of physicians. Groups of 3 to 4 physician (23.3%), groups of 5 to 7 (20.3%), and groups of 8 or more (26.3%) held similar shares of the survey respondents. The shift in group size distribution from that reported at baseline was seen to be due to a change in the nature of the question in the follow-up survey which was reconfigured to produce a more precise response.

In assessing the state of their local health care system (Table 6.1.2.1b), physicians rated the overall quality of their system as fair to good (mean = 2.61), while rating the efficiency of the system somewhat lower (mean = 3.14). In specific areas of health services, physicians rated access to community and hospital services at a similar level (means of 2.94 and 3.16 respectively), while access to long term care was rated somewhat lower, between fair and poor (mean = 3.72).

Table 6.1.2.1b Description of Local Health Care System Variables (Follow-up)

Description	Values and variable distributions		
Quality of Health Care (n = 238)	Mean = 2.61 SD= 0.80	Min. value = 1 Max value = 5	Skewness = 0.241 Kurtosis = 0.150
Efficiency of Health Care (n = 237)	Mean = 3.14 SD= 0.74	Min. value = 1 Max value = 5	Skewness = 0.093 Kurtosis = 0.171
Access to Community Services (n = 221)	Mean = 2.94 SD= 0.74	Min. value = 1 Max value = 5	Skewness = 0.102 Kurtosis =-0.061
Access to Hospital Services (n = 236)	Mean = 3.16 SD= 0.90	Min. value = 1 Max value = 5	Skewness = -0.289 Kurtosis = 0.078
Access to Long Term Services (n = 214)	Mean = 3.72 SD= 0.82	Min. value = 1 Max value = 5	Skewness =-0.626 Kurtosis = 0.521
Cooperation Among Health Providers (n = 237)	Mean = 2.55 SD= 0.68	Min. value = 1 Max value = 5	Skewness =-0.032 Kurtosis = -0.199
Participation in Policy and Planning (n = 223)	Mean = 3.53 SD= 0.84	Min. value = 1 Max value = 5	Skewness = -0.084 Kurtosis = -0.123
Quality of Community Services (n = 238)	Mean = 2.60 SD= 0.86	Min. value = 1 Max value = 5	Skewness = 0.717 Kurtosis = 0.382
Quality of Hospital Services(n = 238)	Mean = 2.50 SD= 0.94	Min. value = 1 Max value = 5	Skewness = 0.335 Kurtosis = -0.341
Quality of Long Term Services (n = 383)	Mean = 2.93 SD= 1.01	Min. value = 1 Max value = 5	Skewness = 0.268 Kurtosis =-0.535

Unlike the baseline results, differences were evident in the quality of the three service areas at follow-up. Physicians rated quality of community services at a similar level (fair to good), while long term care was rated fair. With regard to cooperation and participation, physicians tended to indicate fair to good co-operation between health care providers, but only poor to fair levels of participation by physicians in local policy and planning activities. This was consistent with baseline assessments. The ten health system items produced only minor skewing or kurtosis and recoding was not necessary.

A substantial portion of the respondents (43.5 percent) indicated some form of cost sharing arrangement in their practice setting (Table 6.1.2.2). Revenue sharing or some other type of revenue pooling accounted for 33 percent of physicians, while solo or individual practice accounted for 23 percent of physicians. When assessing the appropriateness of the current practice setting, physicians were somewhat equivocal, neither agreeing or disagreeing, on average, with the appropriateness of their current practice arrangement. At the same time they tended to think that it would be somewhat difficult to change the practice arrangement. Two-thirds of physicians indicated that they shared medical records with other physicians.

The majority of physicians tended to meet as a practice group at least monthly, with a third of the groups meeting at least weekly. In delegating activities to nursing, approximately 30 percent used nurses to perform delegated clinical activities, while another 30 percent reported no role for a nurse in the practice. Approximately two-thirds of the physicians reported referring patients to allied health care providers at least weekly, while 20 percent indicated that they did not refer patients to allied health care providers.

By comparison, less than half of physicians (49.2%) referred patients to health support workers at least weekly, with 27.5 percent indicating that they had not referred any patients in the past year. Technical specialists[1] were least likely to refer patients to an allied or health support worker, while general practitioners were more likely to refer patients. Cognitive and procedural specialists were less likely to refer to allied providers than general practitioners, but indicated similar rates of referral to health support workers.

Table 6.1.2.2 Description of Practice Integration Variables (Follow-up)

Description	Values and variable distributions			%
Arrangement (n=237)	1 = solo/individual practice 2 = share practice expense 3 = revenue sharing/other			23.2 43.5 33.3
Current Arrangement Appropriate* (n=236)	Mean = 2.00 SD = 0.67	Min. value = 1 Max value = 3	Skew = -0.005 Kurtosis = -0.786	
Ability to Change Current Arrangement (n=231)	Mean = 3.82 SD = 1.32	Min. value = 1 Max value = 6	Skew = -0.086 Kurtosis = -0.642	
Share Records (n=216)	1 = Yes 2 = No			67.1 33.9
Frequency of Practice Group Meetings* (n=234)	Mean = 1.94 SD = 0.76	Min Value = 1 Max Value = 3	Skew = 0.108 Kurtosis = -1.250	
Maximum Role of Nursing* (n=235)	Mean = 2.03 SD = 0.77	Min Value = 1 Max Value = 3	Skew = -0.044 Kurtosis = -1.321	
Referrals to Allied Health Providers* (n=237)	Mean = 1.92 SD = 0.69	Min Value = 1 Max Value = 3	Skew = 0.101 Kurtosis = -0.893	
Referrals in Health Support Workers* (n=236)	Mean = 2.20 SD = 0.55	Min Value = 1 Max Value = 3	Skew = 0.049 Kurtosis = -0.170	

* re-coded do to excessive skewing

Physicians indicated that they worked an average of 46.6 hours per week (excluding on call), ranging from five to 85 hours (Table 6.1.2.3). In addition to using the

[1] Recall definitions of cognitive, procedural and technical specialists in Methods, page 103.

raw score of *percent of time allocated to the four main professional activities*, the data were re-coded to create three distinct groups of physicians: those spending much less than the average percent of time on an activity; those spending the average portion of time; and those spending much more time than average.

Table 6.1.2.3 Description of Practice Demand Variables (Follow-up)

Description	Values and variable distributions		Percent (%)
Hours Worked per Week Excluding On Call (n=207)	Mean = 46.6 SD = 12.94	Min Value = 5 Max Value = 85	Skewness = -0.359 Kurtosis = 0.654
Time spent providing patient care* (n=238)	Mean = 2.02 SD = 0.67	Min Value = 1 Max Value = 3	Skewness = -0.024 Kurtosis = -0.765
Time spent on teaching and research* (n=238)	Mean = 2.04 SD = 0.16	Min Value = 1 Max Value = 3	Skewness = -0.062 Kurtosis = -1.231
Time spent maintaining knowledge* (n=238)	Mean = 2.44 SD = 0.89	Min Value = 1 Max Value = 4	Skewness = 0.083 Kurtosis = -0.707
Time spent on admin. duties* (n=238)	Mean = 2.11 SD = 0.66	Min Value = 1 Max Value = 3	Skewness = -0.113 Kurtosis = -0.687
Weekdays On Call per Month (n=238)	None 1 to 4 Evenings 5 to 8 Evenings 9 to 16 Evenings More than 16 Weekday Evenings per Month		13.0 37.8 27.7 12.6 8.8
Weekends On Call per Month (n=237)	Mean = 1.25 SD = 0.84	Min Value = 0 Max Value = 4.5	Skewness = 1.358 Kurtosis = 2.792
Patients With Complicated Clinical Problems* (236)	1 = High to Very High 2 = Low to Moderate		46.6 53.4
Patients with Low Economic Status* (n=229)	Mean = 1.98 SD = 0.70	Min Value = 1 Max Value = 3	Skewness = 0.024 Kurtosis = -0.949
Patients with Personal or Family Problems* (n=212)	1 = High to Very High 2 = Very Low to Moderate		47.4 52.6
Coping with Time Demands (n=238)	Mean = 11.76 SD = 2.44	Min Value = 5 Max Value = 19	Skewness = -0.049 Kurtosis = 0.366

* re-coded do to excessive skewing

The majority of physicians (65.5%) took a weekday evening on call once or twice during the average month. Physicians, on average, worked approximately one weekend on call per month. Physicians indicating no weekday on call made up 13 percent of respondents, and approximately 10 percent indicated no weekend on call.

Patients with complicated clinical conditions were dichotomized as either high to very high (46.6%), or as low to moderate (53.4%). None of the respondents indicated a very low proportion of complicated patients. On average, physicians perceived their share of socioeconomically disadvantaged patients to be moderate. The portion of patients with personal or family problems was evenly split between high to very high (47.4%) and very low to moderate (52.65). The *Coping with Time Demands* construct produced a normal distribution curve with no skewing and only slight kurtosis.

Table 6.1.2.4 Description of Remuneration Variables (Follow-up)

Description	Values and variable distributions			%
Method of Pay (n=236)	1 = Greater than 80% FFS 2 = Up to 80% FFS			71.3 28.7
Current Method of Payment Appropriate (n=237)	Mean = 2.37 SD = 0.99	Min. value = 1 Max value = 5	Skew = 0.416 Kurtosis = -0.515	
Ability to Change Method of Payment* (n=234)	Mean = 2.11 SD = 0.63	Min. value = 1 Max value = 3	Skew = -0.099 Kurtosis = -0.539	
Process for Determining Level of Remuneration* (n=235)	Mean = 2.05 SD = 0.79	Min Value = 1 Max Value = 3	Skews = -0.083 Kurtosis = -1.373	

* re-coded do to excessive skewing

More than 70 percent of physicians indicated that fee-for-service made up more than 80% of their income (Table 6.1.2.4). Physicians tended to be somewhat supportive

of their current method of payment, but equivocated about their ability to change their method of payment. The original item, *process used to determine remuneration fairly reflects all areas of specialization,* was judged too skewed to be properly analysed. The item was re-coded as a 3 point scale and produced a mean of 2.05.

6.1.3 Control Variables at Follow-up

At follow-up, the distribution of respondents reflected the baseline sampling frame with a fairly even split between genders (Table 6.1.3). Physicians ranged in age from 30 to 69 years, with an average age of 46 years. The vast majority of physicians (82.8 percent) again indicated that they were married or living in a common law relationship, with 40 percent of physicians indicating there were no children living at home. On average, the number of years in practice was 17 with a range of 1 to 45 years.

Table 6.1.3 Description of Control Variables (Followup)

Description	Codes, values and variable distributions			%
Gender (n=239)	1 = female 2 = male			49.8 50.2
Age (years) (n=239)	Mean = 46.0 SD = 8.76	Min. value = 30 Max value = 69	Skew = 0.217 Kurtosis = -0.815	
Spouse/partner (n=239)	1 = no 2 =yes			17.2 82.8
Children in the home (Less than 18 yoa.) (n=239)	1 = None 2 = 1 or 2 3 = 3 or More			39.7 39.3 20.9
Years of Practice (n=237)	Mean = 17.0 SD = 9.5	Min. value = 1 Max value = 42	Skew = 0.306 Kurtosis = -0.836	

6.2 Zero-order Correlations at Follow-up

To simplify the model building process, zero-order correlations were used first to identify important relationships between the dependent (*equity, distress* and *wish to reallocate time*), independent (practice conditions) and control variables.

6.2.1 Dependent Variables at Follow-up

Significant correlations were found between all dependent variables (Table 6.2.1). The highest correlations were between unweighted *wish to reallocate time* and *distress* (R = 0.489), between weighted *wish to reallocate time* and *distress* (R = 0.493), and between *equity* and *distress* (R = 0.449). Strong correlations were also observed between *distress* and *extrinsic-tangible equity*, *intrinsic equity*, and *extrinsic-intangible equity*. The weakest correlations were between *wish to reallocate time* and the *equity* measures.

Table 6.2.1 Correlations Between Wish-to-Reallocate-Time, Distress and Equity

Variable	Distress	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	Equity
Wish-to-Reallocate-Time (Unweighted)	0.489***	0.235***	0.283***	0.217**	0.292***
Wish to Reallocate Time (Weighted)	0.493***	0.245***	0.301***	0.208**	0.301***
Distress	-	0.388***	0.405***	0.342***	0.449***

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

The correlations between the dependent variables were very encouraging, in that they indicated strong relationships between the measures representing the main stages of

the hypothesized model of *equity*, *distress* and the *wish to reallocate time*. The relative strength of the relationships also supported the hypothesized pathway sequence, with *distress* acting as an intervening variable between *equity* and the *wish to reallocate time*. Relatively strong associations were found between *distress* and *equity* and between *distress* and *wish to reallocate time*, while somewhat weaker relationships were seen between *equity* and the *wish to reallocate time* measures.

6.2.2 Dependent and Practice Condition Variables at Follow-up

6.2.2.1 Practice Environment

Wish-to-Reallocate-Time: Unlike the baseline measures, no significant correlations were seen with objective practice environment variables for either the *weighted* or the *unweighted* time reallocate measures (Table 6.2.2.1a). Among the local health care system variables (Table 6.2.2.1b), only *'quality of long term services'* was found to correlate significantly to wish-to-reallocate-time ($p < 0.05$).

Distress: Among the objective environmental variables, working in a physician sponsored practice was related significantly to greater distress. Technical specialty was significantly associated with less distress. Distress was also significantly ($p < 0.05$), but weakly correlated with access to community services, access to hospital services, and quality of community, hospital and long term care services.

Equity: Doctors working in physician sponsored practices reported less overall equity than physicians in other sponsorship arrangements ($p < 0.05$). Cognitive specialists perceived greater overall equity compared to general practitioners, procedural

specialists or technical specialists. Specialty also correlated very significantly with extrinsic equity. Cognitive specialists perceived greater intrinsic equity ($p < 0.01$) and general practitioners perceived less intrinsic equity ($p < 0.000$) compared to other specialties. Those physicians working in very large communities (> 500,000), and those working in groups of 5 to 7 physicians, also reported greater intrinsic equity ($p < 0.05$). Physicians in groups of 3 to 4 physicians reported less intrinsic equity than other groups ($p < 0.01$). In effect, the intrinsic rewards perceived by these physicians for the work they do are somewhat less than those perceived by practice groups of other sizes.

Table 6.2.2.1a Correlations Between Dependent and Objective Environmental Variables

Variable	WRT (Unwght)	WRT (Weight)	Distress	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	Equity
Community Size							
> 500,000	-	-	-	-	-0.152*	-	-
Specialty							
Gen. Pract.	-	-	-	-	0.259***	-	-
Cognitive	-	-	-	-	-0.220**	-	-0.167*
Technical	-	-	-0.215**	-	-	-	-
Office Location	-	-	-	-	-	-	-
Sponsorship	-	-	-0.154*	-0.142*	-	-	-0.142*
Size of Group							
3 or 4 MDs	-	-	-	-	0.191**	-	-
5 to 7 MDs	-	-	-	-	-0.144*	-	-

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

The correlations between the dependent variables and objective environmental variables indicated a stronger relationship with perceptions of equity compared to either distress or wish to reallocate time. In particular, characteristics of the practice such as

community size, specialty, location, sponsorship and group size were not found to have any significant relationship with the physician's wish to reallocate their time.

Among the *equity* scales, zero order correlation analysis indicated objective environmental variables were significantly associated with intrinsic equity, while demonstrating little or no association with either extrinsic tangible or extrinsic intangible equity. At baseline, analysis had indicated weak but significant relationships between the objective practice environment and extrinsic intangible equity, and no relationship with intrinsic equity. The inconsistency in the results may be explained by the modification occurring with these two equity scales between the baseline and follow up stages of data collection. *Patient appreciation* was assigned to extrinsic intangible equity at follow-up and *trivial activity* added to intrinsic equity. The follow-up scales are conceptually stronger, providing greater support for the validity of the follow-up findings.

Subjective measures of the practice environment (e.g. quality and access) were also primarily associated with the *equity* scales, with some significantly associated with *distress* and even fewer significant associations between the subjective environment and the physician's *wish to reallocate time* (Table 6.2.2.1b). With the exception of access to long term care and cooperation with *extrinsic-tangible equity*, and the quality of the system and access to community services with *extrinsic intangible equity*, all correlations between *equity* and the health variables were significant ($p < 0.05$) and a substantial number were highly significant ($p < 0.000$).

Although somewhat evident from the objective measures of the environment, differences in the reported state of the local health care system, especially the quality of

the system, were strongly associated with equity. Among the more substantial correlations were: extrinsic tangible equity and the quality of community services (R = 0.308); intrinsic equity and quality of community services (R = 0.278); and equity (overall) and the quality of community services (R = 0.331), and equity (overall) and the quality of long term care services (R = 0.303). Both equity and assessment of the local health care system were based on the subjective assessment of the physicians, and the perception of one may very well be influencing the perception of the other. At this time, however, it would be premature to suggest the direction of the relationship.

Table 6.2.2.1b Correlations Between Dependent and Health System Variables

Variable	WRT (Unwght)	WRT (Weight)	Distress	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	Equity
Quality of System	-	-	-	0.159*	0.154*	-	0.170**
Efficiency of System	-	-	-	0.202**	0.176**	0.171*	0.171**
Access to Community Services	-	-	0.139*	0.236***	0.171*	-	0.236***
Access to Hospital Services	-	-	0.137*	0.172**	0.143*	0.145*	0.189**
Access to Long Term Services	-	-	-	0.145*	-	0.198**	0.152*
Cooperation Among Providers	-	-	-	0.163*	-	0.293***	0.210**
Participation in Policy and Planning	-	-	-	0.181**	0.231**	0.185**	0.251***
Quality of Community Services	-	-	0.145*	0.308***	0.278***	0.142*	0.331***
Quality of Hospital Services	-	-	0.128*	0.190**	0.210**	0.176**	0.220**
Quality of Long Term Services	0.156*	0.155*	0.137*	0.275***	0.233***	0.279***	0.303***

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

6.2.2.2 Practice Integration

Unlike the objective and subjective practice environment variables previously reported, a number of significant relationships were seen between the practice integration variables and all the dependent variables: *equity*, *distress*, and *wish to reallocate time*. The practice integration variables represent aspects of the physician's working conditions and the ability of the physician to change these conditions. As measures of how physicians organize their work and the perceived constraints within the practice setting, the results indicate a relationship between the internal conditions of the medical practice and the *wish to reallocate time*. Practice integration variables were also associated with factors hypothesized to motivate the physician to reallocate time: *equity* and *distress*.

Wish-to-Reallocate-Time: The ability to change the organizational arrangement was significantly correlated to the *unweighted* measure of wish to reallocate time (Table 6.2.2.2), indicating that those perceiving an ability to change were less likely to express a preference for change in their present circumstances ($p < 0.05$). The *weighted* wish to reallocate time measure was significantly related to the ability to change practice arrangement, with physicians in revenue sharing and other forms of income pooling arrangements indicating less preference to reallocate time ($p < 0.05$). In addition, significant correlations ($p < 0.05$) were found between the *weighted* measure and the frequency of referral to allied health care professionals and to health support workers. Those indicating a greater wish to reallocate their time were less likely to refer their patients to either an allied professional or to a health support worker.

Distress: Physicians working in practices with cost sharing arrangements experienced greater distress than other physicians. Similar to the wish to reallocate time measures, the ability to change organizational arrangements was significantly correlated to distress. Physicians inclined to refer their patients to allied health care providers and health support workers indicated less distress than other groups of physicians.

Table 6.2.2.2 Correlations Between Dependent and Practice Integration Variables

Variable	WRT (Unwght)	WRT (Weight)	Distress	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	Equity
Arrangement							
Individual	-	-	-0.136*	-	-	-	-
Share Cost	-	-	0.241***	0.236***	-	0.153*	0.223**
Revenue	-	-0.132*	-0.134*	-0.209**	-	-	-0.179**
Arrangement Appropriate	-	-	-	-	-	-	-
Ability to Change Org.	0.159*	0.141*	0.144*	-	0.168*	-	0.146*
Share Records	-	-	-	0.182**	-	-	0.161*
Practice Group Meetings	-	-	-	-	-	-	-
Role of Nursing in Practice	-	-	-	-	-	-	-
Refer to Allied Health Provider	-	-0.159*	-0.177**	-	-0.145*	-	-
Refer to Health Support Worker	-	-0.163*	-0.227***	-	-0.170**	-	-

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Equity: A number of significant correlations were seen between the overall equity measure and practice integration variables including: practice arrangement, appropriateness of the practice arrangement, ability to change the arrangement, and the

practice of sharing medical records. Those physicians working in revenue sharing and other income pooling arrangements, sharing medical records, and possessing the ability to change the practice arrangement, expressed a greater overall perception of equity.

Among the equity sub-scales, those physicians working in practices with cost sharing arrangements perceived less extrinsic tangible equity, while those participating in revenue sharing and other forms of revenue pooling perceived higher levels of equity. Those sharing medical records reported higher levels of tangible equity. This is consistent with baseline results.

A significant correlation ($p<0.05$) was also found between intrinsic equity and the ability to change the organizational arrangement. Physicians perceiving the ability to change also perceived greater intrinsic equity. Significant correlations were also found with *referring to allied health professional* and *referring to health support workers.* Physicians not routinely referring patients to other health care providers indicated less intrinsic equity in their work. Few significant relations, however, were seen between extrinsic intangible equity and the variables relating to practice integration. Physicians in cost sharing arrangements tended to perceive less equity.

6.2.2.3 Practice Demands

Wish-to-Reallocate-Time: Significant correlations with the *unweighted* time reallocation measure included: regular working hours, percent of time spent on patient care, time spent on teaching and research, time spent on administrative duties, proportion of patients with personal or family problems, and the physician's ability to cope with time

demands (Table 6.2.2.3). Physicians working longer regular hours, spending a lesser proportion of their time on patient care and more time on teaching, research and administration, those with a higher proportion of patients with personal problems and those having difficulty coping with their time demands were more likely to indicate a greater preference to reallocate their time. Similar correlations were found with the *weighted* time reallocation measure.

Table 6.2.2.3 Correlations Between Dependent and Practice Demand Variables

Variable	WRT (Unwght)	WRT (Weight)	Distress	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	Equity
Work Hours (not On Call)	0.179**	0.151*	0.139*	-	-	0.146*	-
Patient care	-0.171**	-0.167**	-	-	-	-	-
Teach & Research	0.155*	0.159*	-	-	-	-	-
CME	-	-	-	-0.140*	-	-	-0.154*
Admin	0.217**	0.190**	-	-	-	-	-
Weekdays On Call	-	-	-	-	-	-	-
Weekends On Call	-	-	-	-	-	-	-
Clinical Problems	-	-	-	-	-	-	-
Socioeconomic Status	-	-	-	-	-	-	-
Personal Problems	-0.167*	-0.163*	-0.209**	-	-0.166*	-0.168*	-
Coping with Time Demands	0.356***	0.329***	0.395***	0.198**	0.312***	0.143*	0.280***

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Distress: Physicians working fewer hours, those reporting a smaller proportion of patients with personal problems, and those able to cope with time demands indicated less distress than other groups of physicians. As with the wish to reallocate time measures, a strong correlation was seen with the *coping* construct ($p < 0.000$; $r = 0.395$), indicating those able to cope with practice demands were less likely to report distress.

Equity: Significant correlations with overall equity were limited to the percent of time spent on maintaining knowledge and coping with time demands. Less equity was associated with less time available for maintaining knowledge and not being able to cope with current time demands. Coping with time demands was highly significant ($p<0.000$).

Among the equity sub-scales, the percent of time spent on maintaining knowledge and coping with time demands were significantly related to *extrinsic tangible equity*. Inequity was associated with less time available for maintaining knowledge and not being able to cope with current time demands. For *intrinsic equity*, significant correlations were found with the proportion of patients with personal problems and coping with time demands. Physicians having a large number of patients with personal problems, and physicians having trouble coping indicated less intrinsic equity in their work.

The strongest correlation was between intrinsic equity and coping with time demands ($p<0.000$; $r = 0.312$). Significant relations were also seen between *extrinsic intangible equity* and the variables relating to: total regular working hours per week; proportion of patients with personal problems; and coping with time demands. However, none of the correlations with extrinsic intangible equity were particular strong; ranging between 0.14 and 0.170 ($p < 0.05$).

On the whole, measures of workload and time presently spent on various activities were associated with the *wish to reallocate time*, indicating some concern with workload and the current distribution of time. At this point, the proportion of patients with personal problems ($p < 0.01$) and the ability of the physician to cope with time demands ($p < 0.001$) were the practice demand variables most strongly associated with reported levels of distress among physicians. While longer hours were associated with distress, the time presently allotted to these activities was not a significant source of either distress or inequity. An apparent lack of association may mean that, for the most part, physicians seek to reallocate time when the workload is too demanding or when certain activities are monopolizing their time, but the amount of work they are required to take on is not itself strongly associated with inequity or distress .

6.2.2.4 Remuneration

Wish-to-Reallocate-Time: No significant correlations were seen between the remuneration variables and the unweighted time reallocation measure, or the weighted measure of wish to reallocate time (Table 6.2.2.4). Neither the method of pay, the ability to change the method of pay, nor the process used to determine the level of remuneration appear to be associated with the wish to reallocate time.

Distress: Physicians perceiving the process by which remuneration among specialties was determined to be fair, indicated less distress than other groups of physicians. As a measure of process equity, the strong association with distress gave support for the hypothesized link between equity and distress. No significant

correlations were observed between distress and the other remuneration variables.

Equity: Significant correlations were seen between the overall equity measure and the method of payment, as well as the appropriateness and ability to change the method of payment. Those physicians paid by salary or mixed method (up to 80% FFS), perceiving their method as appropriate, yet flexible to change, also expressed greater overall perceptions of equity. A highly significant correlation ($p < 0.000$) was also seen with the perceived fairness of the process used to determine remuneration, with less overall equity associated with a perception that the process was unfair.

Table 6.2.2.4 Correlations Between Dependent and Remuneration Variables

Variable	WRT (Unwght)	WRT (Weight)	Distress	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	Equity
Method of PayFFS>80%	-	-	-	-0.137*	-	-0.138*-	-0.133*
Appropriate Method of Pay	-	-	-	0.173*	-	-	0.189**
Ability to Change Pay	-	-	-	-	0.149*	-	0.134*
Remuneration Process	-	-	0.196**	0.370***	-	0.147*	0.327***

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Among the equity sub-scales, those paid by salary or mixed method (up to 80% FFS) reported higher levels of extrinsic tangible equity. The appropriateness of the payment method was also significantly correlated with *extrinsic-tangible equity*, and the remuneration process, in particular, was strongly correlated with *extrinsic intangible equity* ($p < 0.000$; $r = 0.370$). A significant correlation ($p<0.05$) was found between

intrinsic equity and the ability to change the method of payment, with physicians perceiving the ability to change their method of pay reporting greater intrinsic equity. Physicians paid primarily by fee-for-service tended to perceive less *extrinsic intangible equity* ($p < 0.05$), and a significant relationship was also seen between *extrinsic intangible equity* and the remuneration determination process ($p < 0.05$).

6.2.3 Dependent and Control Variables

None of the control variables correlated significantly with *wish to reallocate time* or *distress* (Table 6.2.3). Among the equity measures, *extrinsic intangible equity* correlated significantly with the number of children living at home.

Table 6.2.3 Correlations Between Equity and Control Variables

Variable	WRT (Unwght)	WRT (Weight)	Distress	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	Equity
Gender	-	-	-	-	-	-	-
Age (years)	-	-	-	-	-	-	-
Spouse/partner	-	-	-	-	-	-	-
Children at home 1 = More than 2	-	-	-	-	-	-0.192**	-
Years of Practice	-	-	-	-	-	-	-

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

6.2.4 Summary of Correlation Results

Although analysis based on zero-order correlations is limited by its inability to control for interaction and confounding by other variables, it is a useful technique for identifying potentially important relationships. In carrying out this analysis, strong

relationships were found between the variables representing the three main stages of the hypothesized model (equity, distress and wish-to-reallocate time). Among the practice condition variables, however, the strongest and largest number of relationships were seen with the equity measures, with fewer significant relationships between the practice variables and either distress or wish to reallocate time.

6.3 Preliminary Model Building Using Linear Regression

Following the analysis of the data using zero-order correlation, the next step was to establish the contribution of significant variables to equity, distress and wish to reallocate time using multiple linear regression (MLR). Regression analysis was carried out in three stages: Stage One with *equity* as the dependent variable (*distress* and *wish to reallocate time* excluded from the model); Stage Two with *distress* as the dependent variable and *wish to reallocate time* excluded from the model; and Stage Three with *wish to reallocate time* as the dependent variables and no significant or borderline significant variables excluded from the model. Building simple linear regression models focussing on the relationships between a number of independent and control variables and a single dependent variable was carried out as a preliminary step to the construction of more complex multistage models.

6.3.1 Stage One: Equity

Stage One consisted of testing the four equity scales. Each equity scale, in turn, was used as the dependent variable with the right hand side of the model comprised of

significant and borderline practice condition variables, significant and borderline mutable control variables and the immutable control variables:

$$Equity = f(Practice\ Conditions, Control\ Variables).$$

Equity (overall) is a construct of eight items, including: *work too hard for rewards received; financial compensation reflects experience; financial compensation reflects stresses; in general the rewards for the work you do; interesting work; sense of accomplishment; making the extra effort is worth it;* and *patients are appreciative.* This scale replicated the aggregate scale developed from the baseline data and proved to be very reliable with a Cronbach's alpha of 0.81. Together, these 8 items represented the three facets of distributive equity, but primarily reflected the tangible extrinsic rewards (4) and the intrinsic rewards (3) associated with perceptions of equity; only *patients are appreciative* reflected intangible extrinsic rewards.

Community size and specialty were found to be significantly associated with *overall equity* (Table 6.3.1). Cognitive specialists, procedural specialists, and those living in very large communities (> 500,000) perceived greater equity than other physician groups. Community-based and long term care services rated to be of higher quality were also associated with greater *overall equity.*

The practice arrangement ($p < 0.01$) and the sharing of medical records ($p < 0.05$) were significantly associated with *overall equity.* Those working in practices that did not use a cost sharing arrangement and those sharing medical records perceived greater equity than other physician groups. The ability to cope with time demands and the fairness of the process used to determine remuneration were also associated with greater equity.

Table 6.3.1 Hierarchical Regression: Equity Constructs

Dependent Variables	Equity	Extrinsic Tangible	Intrinsic	Extrinsic Intangible
R	0.662	0.556	0.638	0.452
R^2	0.439	0.321	0.407	0.205
Adjusted R^2	0.400	0.293	0.366	0.171
n	204	227	202	195
Model	Standardized Beta Coefficients			
Gender	-	0.147*	-	-
Age	-	-	-	-
Living with a partner	-	-	-	-
Number of children < 18 years	-	-	-	-
Community Size = > 500,000	-0.132*	-	-0.126*	-
Specialty = GP	-	-	0.264***	-
Specialty = Cognitive	-0.227***	-	-	-
Specialty = Procedural	-0.202**	-	-	-
Group Size = 3 to 4 Doctors	-	-	0.187**	-
Cooperation	-	-	-	0.165*
Participation in Policy/Planning	-	-	0.194**	-
Quality Community Services	0.191**	0.254***	0.230***	-
Quality Long Term Care	0.173*	-	-	0.249***
Arrangement = Cost Sharing	0.182**	0.163**	-	-
Share Medical Records	0.151*	-	-	-
Pt: Complicated Conditions	-	-	0.136*	-
Pt: Low socioeconomic status	-	-	-0.163**	-
Pt: Personal/family problems	-	-	-	-0.172*
Coping	0.265***	0.187**	0.290***	-
Method of Pay	-	-	-	0.188**
Current method appropriate	-	0.169**	-	-
Process Rep. Specialties	0.287***	0.312***	0.132*	-

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

No significant contributions were made to *overall equity* by any of the control variables. The physician's gender, age, marital status and number of children living at home were not significantly associated with equity (overall).

Hierarchical regression incorporating immutable control variables and significant practice condition variables resulted in a model with an adjusted R-squared of 0.400 . The final model indicated that the practice environment (objective and subjective), the level of practice integration, the remuneration process and the ability to cope, together explained a substantial portion of the variance seen with *overall equity.*

Extrinsic Tangible Equity was a construct of the four items: *work too hard for rewards received; financial compensation reflects experience; financial compensation reflects stresses*; and *in general the rewards for the work you do,* and replicated the scale established at baseline.

Among practice environment variables, the quality of community services was significantly associated with *extrinsic-tangible equity* ($p < 0.001$). Of the practice integration variables, practice arrangement was found to make a significant contribution ($p < 0.01$) with physicians in cost sharing arrangements perceiving less *extrinsic-tangible equity.* Although coping with time demands was the only significant practice demand variable, it was highly significant ($p < 0.001$). The remuneration variables, appropriateness of the method of payment and the fairness of the process used to determine remuneration were significant, with an inappropriate method of pay ($p < 0.01$) and less fairness in the remuneration process ($p < 0.001$) strongly associated with less *extrinsic-tangible equity.*

Among the immutable control variables only gender was found to be significantly associated with *extrinsic tangible equity*. Males physicians tended to perceive slightly less extrinsic-tangible equity as compared to their female counterparts. The physician's age, marital status or number of children living at home were not significantly associated with *extrinsic-tangible equity*.

Hierarchical regression incorporating immutable control variables and significant practice condition variables resulted in a model with an adjusted R-squared of 0.293 . The explained variance of the final model was less than that reported for overall equity, and contributing variables were limited to the subjective practice environment, remuneration, the ability to cope, and gender. In particular, perceptions of tangible-extrinsic inequity (i.e. under paid) were most strongly associated with the remuneration process. Physicians perceiving the process used to establish remuneration levels as unfair were more likely to report their own level of tangible extrinsic rewards to be inadequate ($R = 0.312$; $p < 0.001$).

Intrinsic Equity is a construct of four items: *the amount of interesting work; a sense of accomplishment; making the extra effort is worth it*; and *the amount of trivial work*. This scale was slightly modified from baseline, *appreciation of patients* being replaced by *amount of trivial work*. However, the reliability of the scale was relatively unchanged and actually improved slightly (Cronbach's alpha rose from 0.67 to 0.70).

A number of practice environment variables were found to be significant, including: community size; specialty; group size; participation by physicians in local policy and planning; and the quality community-based services. General practitioners

($p < 0.001$) and physicians in groups of 3 or 4 physicians ($p < 0.01$) were less likely to perceive *intrinsic equity*, while those in the largest communities were more likely to report greater *intrinsic equity* ($p < 0.05$). Greater participation ($p < 0.01$) and higher quality community-based services ($p < 0.001$) were also associated with higher *intrinsic equity*. The strongest associations with greater *intrinsic equity* were seen with a specialty designation (not a general practitioner) and a higher assessment of the quality of community-based services.

Among practice demand and remuneration variables, the proportion of patients with complicated clinical problems, the proportion of patients with low socioeconomic status, the physician's ability to cope with time demands, and the fairness of the process used to determine remuneration were all significantly related to *intrinsic equity*. A greater share of clinically complicated patients ($p < 0.05$), a lower proportion of socially disadvantaged patients ($p < 0.01$), the ability to cope ($p < 0.001$), and a remuneration process perceived as fair ($p < 0.05$) were all associated with greater *intrinsic equity*. Particularly strong was coping with time demands ($p < 0.001$). Among immutable control variables, no significant relationships were observed with *intrinsic equity*.

Hierarchical regression resulted in a model explaining approximately 37% of variance (adjusted $R2 = 0.366$). The distribution of contributing variables in the *intrinsic equity* model was similar to that reported for the overall equity scale, with contributions from practice environment (objective and subjective), practice demands, and remuneration. The one exception was practice integration where none of the items made a significant contribution to the model.

Extrinsic Intangible Equity is also a construct of four items: *level of respect from patients; level of respect from nurses; level of respect from administrators*; and *patients are appreciative*. The addition of *appreciation of patients* did not substantially improve the reliability of the measure (Cronbach's alpha = 0.58).

Among practice environment variables, significant associations were seen with the quality of long term care services and the level of cooperation among health care providers (Table 6.3.1) . No significant associations were found between the practice integration variables and *extrinsic intangible equity*. Among the practice demand variables, only the proportion of patients with personal or family problems made a significant contribution to *extrinsic intangible equity.*

The method of pay was the one remuneration variable found to make a significant contribution. Physicians reporting more patients with personal problems, or indicating a greater reliance on fee-for-service (more than 80 percent) as their method of payment, were more likely to report lower *extrinsic-intangible equity.* Among immutable control variables no significant relationships were with *extrinsic intangible equity.*

Hierarchical regression resulted in an adjusted R-squared of 0.171. The only variables making a substantial contribution to *extrinsic-intangible equity* was quality of long-term care ($p < 0.001$) and method of payment ($p < 0.01$). As such, the practice conditions of the physician appear to have little to do in determining the perceived value to the intangible rewards provided by patients and colleagues.

6.3.2 Stage Two: Distress

Stage Two tested the distress scale with the right hand side of the model comprised of the equity scales, significant and borderline practice condition variables, significant and borderline mutable control variables and the immutable control variables:

Distress = f(Equity, Practice Conditions, Control Variables).

Distress at follow-up was a construct of five items, including: *experience conflict between home and work; experience fatigue during the day; the physician's self-rated level of stress; frustration dealing with demanding patients*; and *feel fatigued during the day.* [2] The distress measure at follow-up was modified from baseline with *feel rushed* and *get enough sleep* replaced by two items measuring *frustration with patients* and *frustration with access to services.* The items removed from the baseline distress scale eventually were incorporated in a new coping scale.

With the exception of specialty, no significant associations were found among practice environment variables (Table 6.3.2). Technical specialists were much less likely to experience *distress* compared to other specialties ($p < 0.000$; $r = -0.260$). No significant contributions were made by the practice integration variables.

Lower levels of *distress* were associated with treating a greater proportion of patients with complicated conditions ($p < 0.01$) and the ability to cope with time demands ($p < 0.000$). No other significant associations were seen with the remuneration variables. Significant relationships were seen between each of the three *equity* sub-scales and

[2]The four item coping scale (time to pursue hobby, time to keep up with specialty, complete work without feeling rushed and get a full night's sleep) was entered separately as an independent variable.

distress, with perceptions of inequity associated with greater levels of distress.

Table 6.3.2 Hierarchical Regression: Distress Construct

Dependent Variable	Distress
R	0.649
R^2	0.421
Adjusted R^2	0.394
n	221
Model	Standardized Beta Coefficients
Gender	-
Age	-0.112*
Living with a partner	-
Number of children < 18 years	-
Specialty = Technical	-0.260***
Pt: Complicated Conditions	-0.144**
Coping with Time Demands	0.298***
Extrinsic Tangible	0.169**
Intrinsic	0.166**
Extrinsic Intangible	0.225***

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Among control variables, a significant relationship was observed with age. Older physicians were less likely to be distressed compared to younger physicians. Gender, marital status and number of children were not significantly associated with *distress*.

Hierarchical regression resulted in an adjusted R-squared of 0.394, or explained almost 40% of variance associated with reported levels of *distress*. Although a number of

practice items had been found to be significantly associated with *distress*, after controlling for perceptions of *equity*, most of these items disappeared from the model. While practice conditions may affect perceptions of equity, they may only indirectly affect the physician's level of distress. The main exception was *coping with time demands* ($R = 0.298$; $p < 0.001$), which was also an important component in the equity models (Stage One).

6.3.3 Stage Three: Wish to Reallocate Time

Stage Three consisted of testing the wish to reallocate time (WRT) scales (*unweighted and weighted*). Each WRT scale was used as the dependent variable, with the right hand side of the model containing distress, equity and significant and borderline practice condition variables, significant and borderline mutable control variables and the immutable control variables:

$$WRT = f(Distress, Equity, Practice\ Conditions, Control\ Variables)$$

Wish to Reallocate Time (Unweighted) was an eight item construct: *solo assessment and treatment; team-based assessment and treatment; research; teaching; solo continuing education; group education; administration of own practice*; and *program-based administration.* Based on the baseline items, the scale created from the items used in the follow-up survey used fewer items with a wider range of responses per item. Combined, the 8 items in this scale represented the *wish to reallocate time* across four principal activities: patient care, teaching and research, continuing education and administration. Reliability was acceptable at 0.70 (Cronbach's alpha).

No significant relationships were found among the practice environment or practice integration variables (Table 6.3.3). Among the practice demand variables, the portion of time currently spent on teaching and research ($p < 0.05$), the portion of time currently spent on administration ($p < 0.01$), and the physician's ability to cope with time demands ($p < 0.01$) were significantly related to the *unweighted* wish to reallocate time. A higher portion of time spent in teaching and research or on administration, and the inability to cope with time demands were associated with a greater wish to reallocate time. Particularly significant was the association between *distress* and *unweighted wish to reallocate time* ($p < 0.001$). Increasing distress was associated with an increasing wish to reallocate time.

There were no significant immutable control variables indicating that the physician's gender, age, marital status, and number of children at home were not significantly related to the wish to reallocate time.

Hierarchical regression incorporating immutable and significant mutable control variables, practice conditions, *equity* and *distress* resulted in an adjusted R-squared of 0.293. The explained variance was due almost entirely to distress, with additional variance explained by coping and current time allocations. What is most noteworthy was the total subsuming of the *equity* constructs, despite substantial correlations between *WRT* and *equity*, supporting the role of *distress* as an intervening variable.

Wish to Reallocate Time (Weighted) consisted of four, two-item constructs representing patient care, teaching and research, maintaining knowledge, and administration adjusted to reflect the relative amount of time currently devoted to each

activity. The objective was to give greater weight to the *wish to reallocate time* to those areas constituting the larger portion of the physician's time.

Table 6.3.3 Hierarchical Regression: Wish to Reallocate Time (WRT)

Dependent Variables	WRT (unweighted)	WRT (weighted)
R	0.563	0.582
R^2	0.317	0.339
Adjusted R^2	0.293	0.304
n	235	202
Model	Standardized Beta Coefficients	
Gender	-	-
Age	-	-
Living with a partner	-	-
Number of children < 18 years	-	-
Specialty = Procedural	-	-0.197**
Revenue Sharing/Other	-	-0.177**
Arrangement is Appropriate	-	-0.183**
Hours Worked per Week	-	0.195**
Portion of Time Teaching/Research	0.111*	-
Portion of Time Administration	0.180**	-
Coping	0.161*	-
Distress	0.397***	0.395***

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Among the practice environment variables, a very significant relationship was seen with specialty ($p < 0.01$), with procedural specialists indicating a greater wish to reallocate their time. Among the practice integration variables, very significant

contributions to the model were associated with the practice arrangement and appropriateness of the practice arrangement ($p < 0.01$). Those working in a practice with revenue sharing or some other form of income pooling arrangement, and those perceiving the current practice arrangement to be inappropriate, indicated a greater wish to reallocate their time. Finally, higher levels of distress were associated with a greater wish to reallocate time. As with the *unweighted* time measure, a very significant relationship was seen with distress ($p<0.001$).

Among the immutable control variables no significant relationships were seen with the *weighted* wish to reallocate time measure. The physician's gender, age, marital status, and number of children at home were not significantly associated.

Hierarchical regression resulted in a slightly higher adjusted R-squared of 0.304 compared to the *unweighted* wish to reallocate time measure. More importantly, weighting the scale caused different practice condition variables to become significant. However, the relative contribution of *distress* remained virtually the same and *equity* still did not contribute to the explained variance.

6.3.4 Summary of Preliminary Model Building Using Linear Regression

The relationships established by simple linear regression support the multistage model presented in Figure 6. The simple regression models found that practice conditions, such as environment, level of integration and remuneration were primarily associated with equity. *Equity* was also associated with the physician's ability to cope with time demands. *Distress* was explained primarily by equity and coping. In turn,

wish-to-reallocate time was associated with distress and coping. Although preliminary analysis showed a relationship between equity and the wish to reallocate time, once distress and coping were introduced into the model, the relationship was no longer significant.

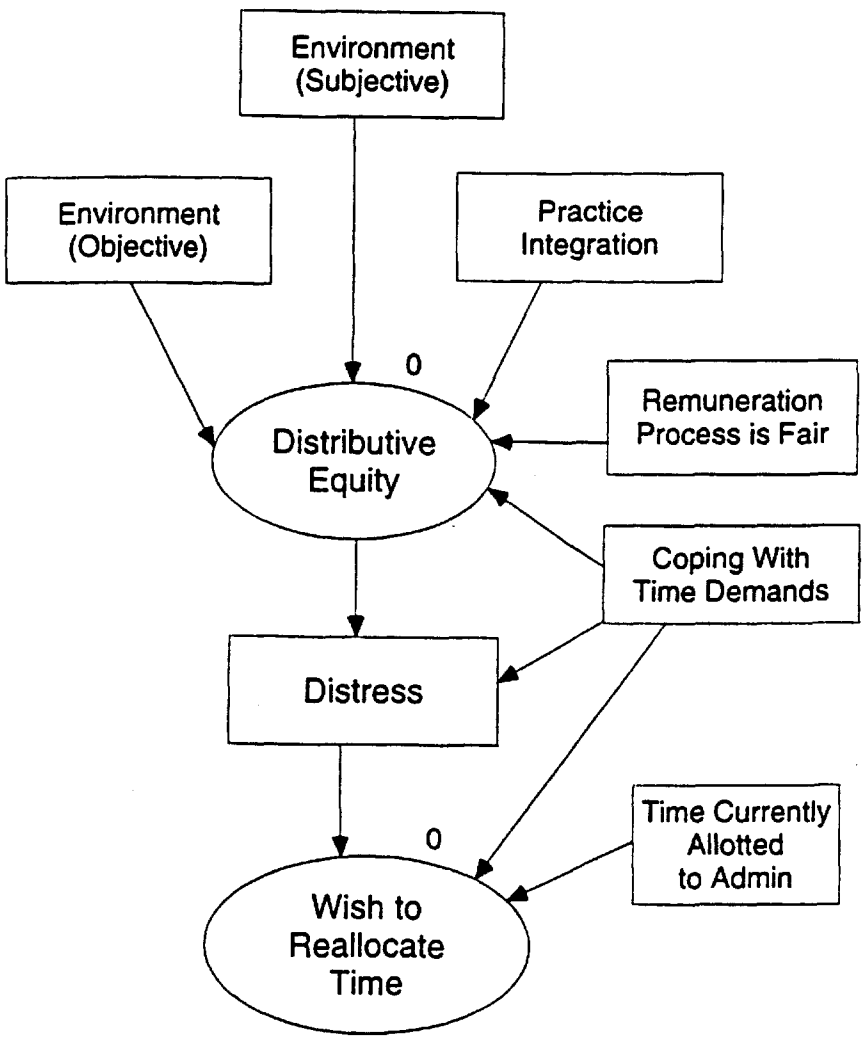

Figure 6: Model Suggested By Simple Linear Regression

While the simple regression models pointed toward a multi-stage model, more complex, sequential relationships could not be tested using simple linear regression. However, the results of the regression analyses, and the constructs on which the dependent variables were based, could be used as the basis for building a multi-stage model to be tested using structural equation modelling (SEM).

6.4 Modelling the Equity-Distress-Wish to Reallocate Time Pathway

Multiple linear regression supported the proposed model when the hypothesized stages of the model were being considered individually. Now that the entire model was being considered, structural equation modelling (SEM) was the next logical step in the model building process. Essentially a combining of regression and factor analysis (Tabachnick & Fidell, 1996), SEM allowed for the simultaneous consideration of all the model stages and pathways.[3]

SEM also allows the construction of latent variables which can potentially capture more of the variance found in the model (Kline, 1998; Maruyama, 1998). To better capture the contribution of individual items and sub-scales, latent variables (as opposed to the constructs used in earlier analysis) were created for: *distributive equity; wish to reallocate time; local health care system; wish to reallocate professional time; and wish to reallocate administrative time* (these variables will be described in more detail as they are introduced into the model).

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[3] Factor analysis has already been used to create valid and reliable measures and multiple linear regression identified statistically significant and parsimonious models for each stage in the hypothesized model.

Initially, SEM was used to construct a model of the main pathway between *equity*, *distress* and the *wish to reallocate time* (the main pathway). It was critical to establish the strength of this hypothesized pathway (*a priori*) before any subsequent analysis would be possible.[4] Based on the strength of the main pathway relationships, a more complex model involving practice conditions variables was carried out in three stages: *distributive equity* as the dependent variable (Stage 1); *distress* as the dependent variable (Stage 2); and *wish to reallocate time* as the dependent variable (Stage 3).

SEM is used primarily to confirm hypothesized pathways, but can also be used for exploratory analysis (Tabachnick & Fidell, 1996). Although guided by a conceptual model and relationships established by linear regressions, SEM was used both as a confirmatory and as an exploratory method of analysis in this study.

6.4.1 The *Main Pathway* Model

Prior to constructing the SEM model, the relationships between the main pathway constructs were exampled using a correlation matrix (Table 6.4.1.1). Good correlations were seen between the three *equity* constructs, and between the four *wish to reallocate time* constructs. Strong correlations were also seen between the *equity* constructs and distress, and between the *wish to reallocate time* and *distress*. Relatively weaker, and in

[4] Unlike the earlier regression analysis, which used only complete cases, SEM will include cases with missing data. This presents the possibility of introducing bias if missing data was not randomly dispersed. To determine the significance of this threat to the validity of the SEM analysis, a model of all significant pathways identified in linear regression was constructed using SEM. With the exception of an insignificant relationship between the distress construct and age of the physician ($p = 0.069$), all relationships established by regression analysis continued to be significant under SEM using all 240 available cases (Appendix 3). The persistence of these significant relationships in the analysis supports the position that the missing data were randomly dispersed and will not produce systematic bias in subsequent SEM analysis.

some cases insignificant, correlations were observed between *equity* and *wish to reallocate time*. Taken together, these correlations supported creating two latent variables (*Distributive Equity* and *Wish-to-Reallocate-Time*) and the creation of a multi-stage model of the *equity* to *distress* to *wish to reallocate time* pathway.

Table 6.4.1: Inter-correlations and internal consistencies (Cronbach's alphas) for variables used in main pathway constructs (n=240)

	Distributive Equity				Wish to Reallocate Time			
Constructs	Extrinsic Tangible	Intrinsic	Extrinsic Intangible	Distress	SP	HTL	KS	PM
Extrinsic Tangible	(0.78)							
Intrinsic Equity	0.429***	(0.70)						
Extrinsic Intangible	0.347***	0.284***	(0.58)					
Distress	0.388***	0.397***	0.330***	(0.74)				
Scholarly Practitioner	0.103	0.081	0.184**	0.245***	(0.68)			
Health Team Member	0.135*	0.227***	0.053	0.308***	0.230***	(0.53)		
Knowledge Seeker	0.139*	0.191**	0.177**	0.282***	0.252***	0.223**	(0.78)	
Practice Manager	0.220**	0.230***	0.091	0.412***	0.145*	0.226***	0.172**	(0.78)

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

The latent variable, *distributive equity*, is based on the three equity sub-scales, described in detail in Methods (p. 113-114). Fours items: *pay reflects stress, pay reflects experience, equity of rewards* and *work too hard for rewards received*, loaded into the construct (Cronbach's alpha = 0.78) designated "extrinsic tangibles". Fours items: *interesting work, sense of accomplishment, extra effort worth the effort*, and *trivial activity*, formed the second construct designated "intrinsic intangible" (Cronbach's alpha = 0.70). The final four items, three dealing with respect from others and appreciation of

patients, loaded into the third construct designated "extrinsic intangibles".

The latent variable, *wish-to-reallocate-time*, contained four sub-scales described in Methods (pages 122-125). Three items (research, teaching, providing patient care alone) in the first scale reflect the scholarly practitioner, with a reliability of 0.68 (Cronbach's alpha). The second scale (the knowledge seeker) consisted of two items (reading journal, clinical rounds). The third scale (the practice manager) also consisted of 2 items (completing paperwork, meetings and reports). Both scales produced reliability of 0.78 (Cronbach's alpha). The three remaining items (teamwork, communicating, counseling) made up the fourth and final scale (the health team member) with a reliability of 0.53 (Cronbach's alpha).

The *Main Pathway* model (Figure 7) is conceptually limited in that it does not consider the contribution of practice conditions, however, it does allow for the examination of the fundamental relationship between *equity*, *distress* and *wish to reallocate*. SEM produced strong pathway coefficients between the three main pathway constructs. All relationships in the model were highly significant ($p < 0.000$). The correlation (R) between distributive equity and distress was 0.61 and explained 38% of the variance associated with distress (R^2). In turn, the correlation between distress and the wish to reallocate time was also strong (0.71), explaining 50% of variance.

The latent variable, *distributive equity*, was significantly and strongly related to each of the equity sub-scales. Correlations were 0.50 for extrinsic intangible equity, 0.63 for intrinsic equity, and 0.66 for extrinsic tangible equity. As with earlier analysis, extrinsic intangible equity is relatively weak but still significant.

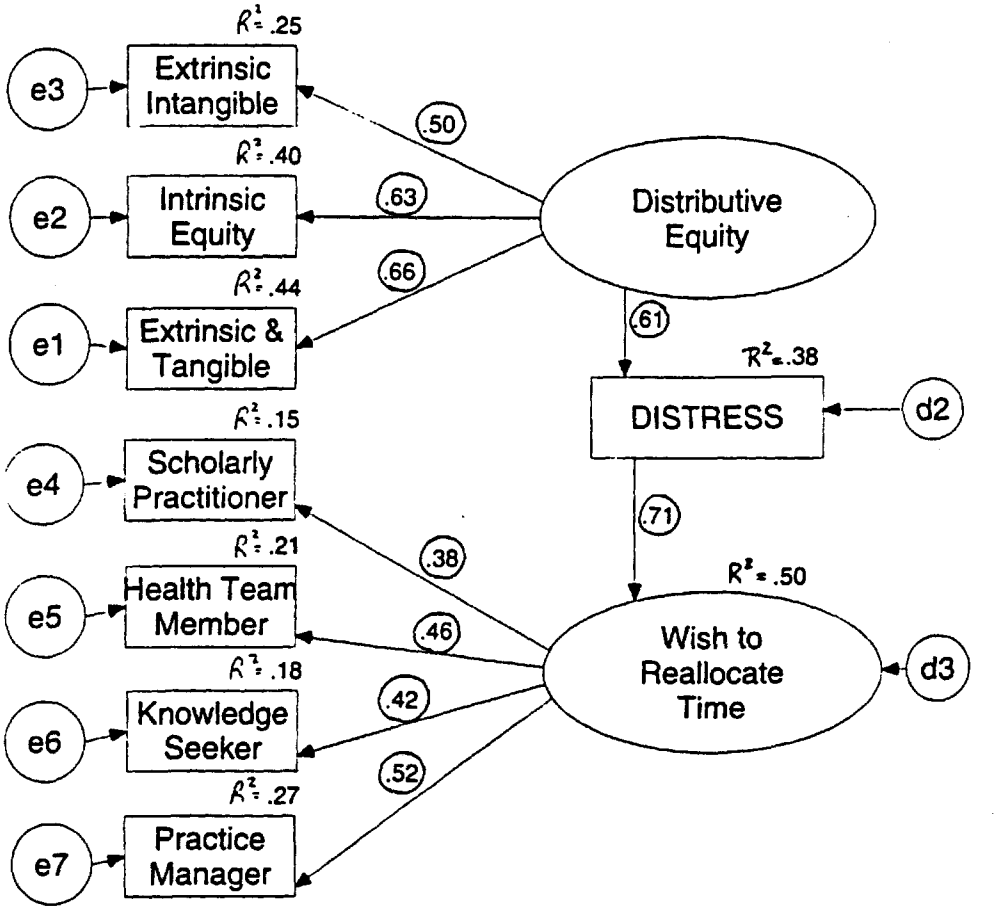

Figure 7: *Main Pathway* Structural Equation Model

Note 1: Values inside circles represent path coefficients
Note 2: All critical ratios are highly significant ($p < 0.001$)

The wish to reallocate time sub-scales were significantly and strongly related to the latent variable: wish to reallocate time. Correlations were 0.38 for scholarly practitioner, 0.42 for knowledge seeker, 0.46 for health team leader, and 0.52 for practice manager. As with earlier analysis, the items associated with scholarly practitioners produced the weakest association.

The *Main Pathway* Model produced Goodness-of-Fit statistics well within accepted limits (Appendix 4). The Norm Fit Index and Incremental Fit Index indicated a good fit relative to the worst possible model, and the P value was not significant ($p = 0.175$). Discrepancy per degree of freedom was within the accepted limit of less than 2, and the Hoelter 0.05 Index (294) was greater than the minimum sample size. In addition, P for Test of Close Fit was good at 0.718 (1.00 = best possible fit). The RMSEA (0.028) was very low, with even the upper bound indices within the desired range (< 0.05). All indices indicate a valid model with excellent fit.

Critical ratios for all the model parameters (the parameter estimate divided by the standard error of the parameter) were highly significant ($p = 0.000$), indicating that the model's good fit and explained variance was due to the variance captured by the items used in the model, rather than due to excessively large error terms.

6.4.2 Stage ONE Model: Equity and Practice Conditions

Building the Stage One Model began with the variables identified by simple regression, using the latent variable, *distributive equity,* as the dependent variable. The variables tested included a range of items that were significantly associated with at least

one of the equity scales. In building a model reflecting the relationships anticipated between equity, practice conditions, and physician characteristics, significant associations ($p < 0.000$) were found between distributive equity and the state of local health care, coping with time demands and fairness of the remuneration process (Figure 8).

The model produced acceptable Goodness-of-Fit statistics (Appendix 5). The Norm Fit Index and Incremental Fit Index indicated a good fit relative to the worst possible model, and the P value was not significant ($p = 0.062$). Discrepancy per degree of freedom was within the accepted limit of less than 2, and the Hoelter 0.05 Index (247) was greater than the minimum sample size. In addition, P for Test of Close Fit was moderate at 0.463 (1.00 = best possible fit). The RMSEA was acceptable (0.050).

In the process of fitting the data to the proposed model, it became apparent that a number of subjective environmental items were significantly associated with distributive equity. *State of local health care system* was a latent variable created from three of these items: efficiency of the system; the accessibility of hospital services; and the quality of community-based health services. Coping was an exogenous construct of four items with an acceptable reliability of 0.64 previously developed and tested. The process measure was a single survey item measuring the fairness of the process used to determine the remuneration of various specialties.

The correlation (R) between state of local health system and distributive equity was very good (0.59), explaining 35% of the variance (R^2) associated with equity. The correlation between equity and coping (0.30), and between equity and the fairness of the remuneration process (0.314), were somewhat less but still good. Together, the three

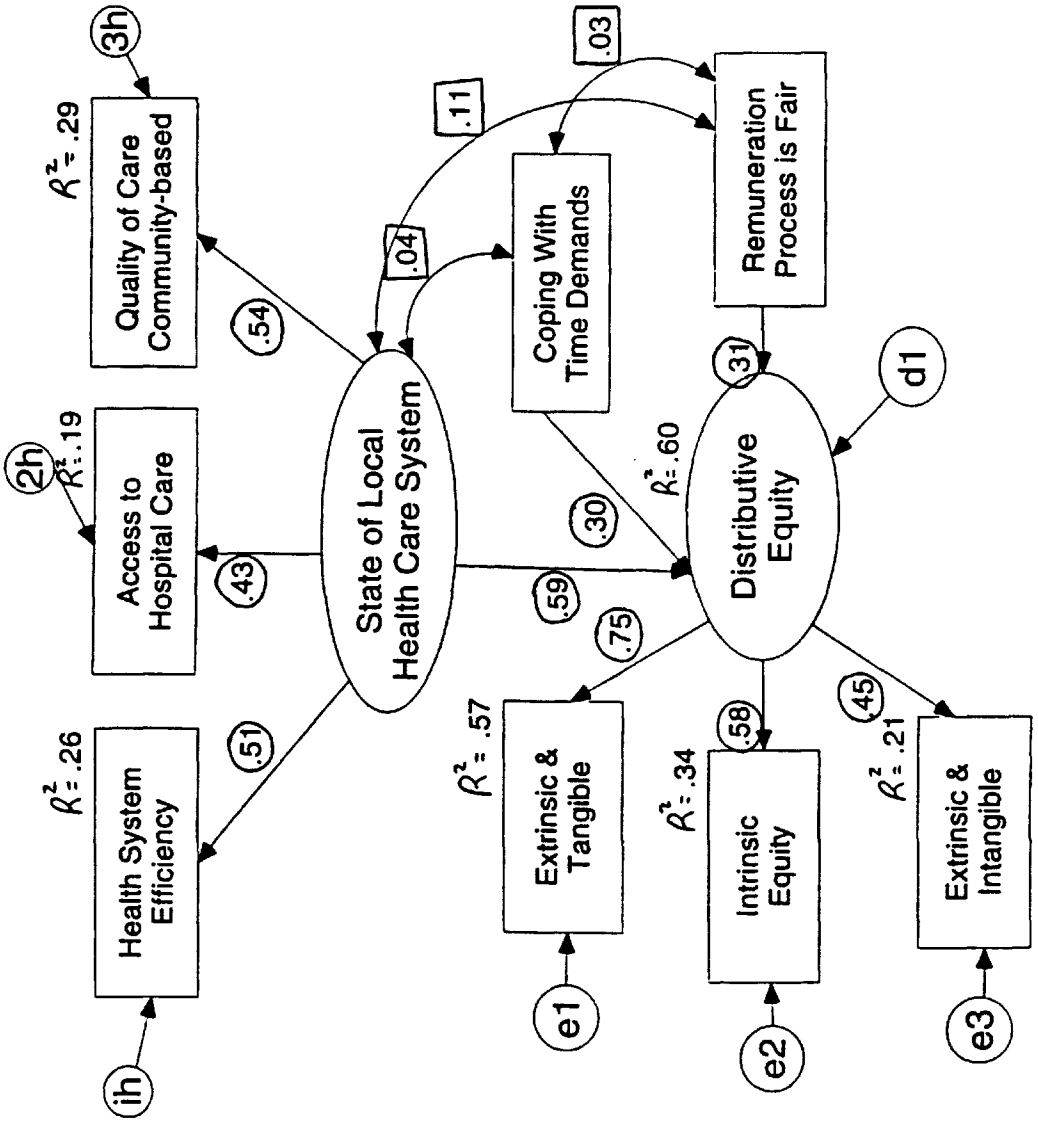

Figure 8: *Stage ONE* Structural Equation Model

Note 1: Values inside circles represent path coefficients
Note 2: Values inside squares represent covariant correlations
Note 3: All critical ratios are highly significant ($p < 0.001$)

variables explained 60% of the variance associated with equity.

Critical ratios for all intercept and mean parameters were highly significant ($p < 0.000$). The relationship between the three independent variables were also examined by estimating covariances. None of the pathways were found to be significant, however, the pathways were retained to allow the model to compensate for minor inter-item correlations.

6.4.3 Stage TWO Model: Distress, Equity and Practice Conditions

Distress (a five item construct) was used as the dependent variable in the next stage in the model building process. As with the Stage One, variables found to be significant using simple regression were introduced into the model. Given the presence of the items identified by the Stage One Model, however, no new items, with the exception of distress, were added to the model (Figure 9)

The *Stage Two* Model produced acceptable Goodness-of-Fit statistics (Appendix 6). The Norm Fit Index and Incremental Fit Index indicated a good fit relative to the worst possible model, and the P value was not significant ($p = 0.113$). Discrepancy per degree of freedom was within the accepted limit of less than 2, and the Hoelter 0.05 Index (269) was greater than the minimum sample size. In addition, P for Test of Close Fit was good at 0.668 (1.00 = best possible fit). The RMSEA (0.040) was less than 0.05. The addition of distress produced a model that was a good fit, and a slight improvement over the indices reported for the *Stage One* model.

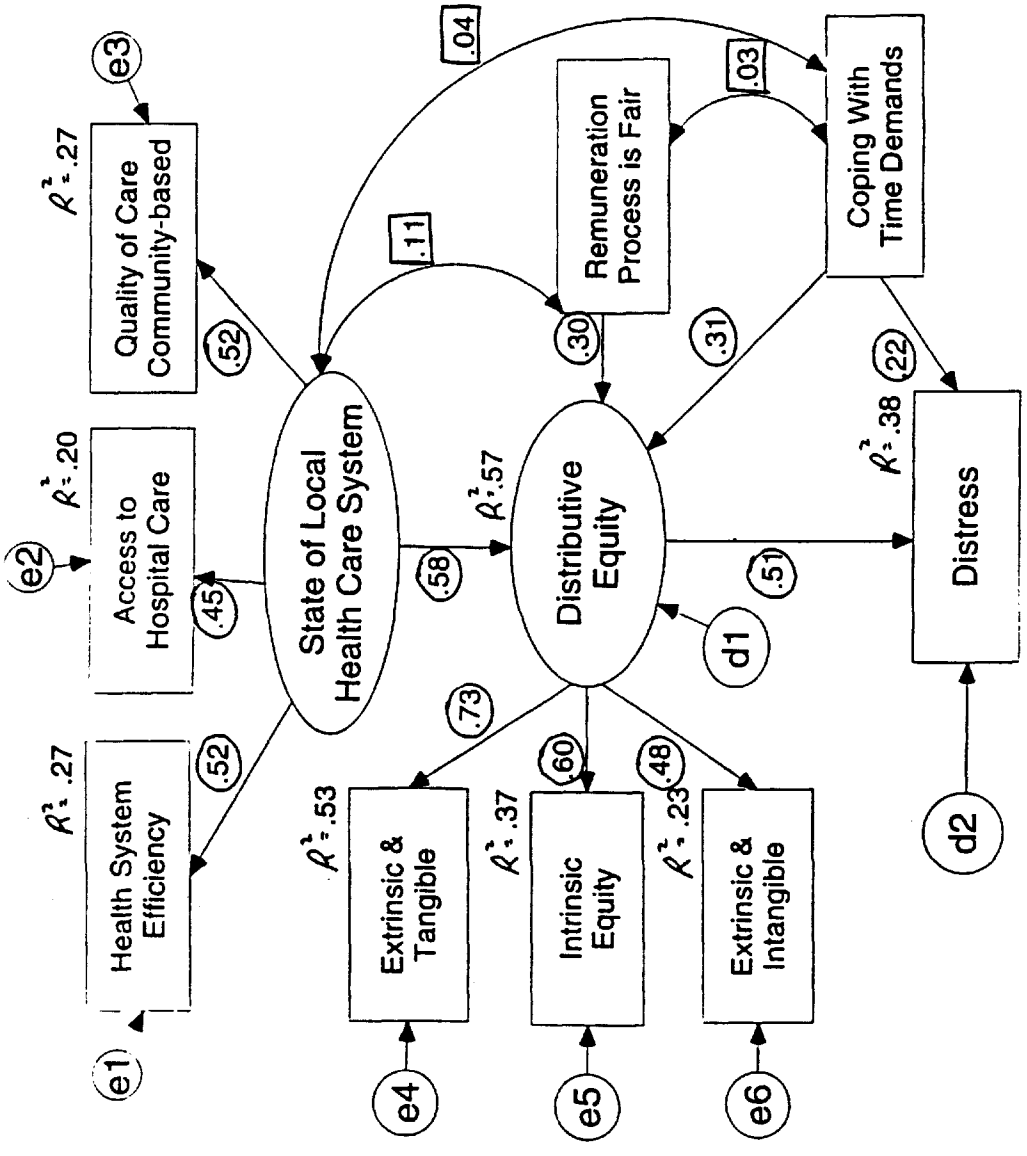

Figure 9: *Stage TWO* Structural Equation Model

Note 1: Values inside circles represent path coefficients
Note 2: Values inside squares represent covariant correlations
Note 3: All critical ratios are highly significant ($p < 0.001$)

In addition to the very strong association with distributive equity ($p < 0.000$; $R = 0.51$), a significant association was seen between distress and coping with practice demands ($p < 0.000$; $R = 0.22$). Together, distributive equity and coping with time demands explained 38% of the variance associated with distress. Critical ratios for all intercept and mean parameters were highly significant ($p < 0.000$), indicating fit was not due to large error terms. Although not significant, the existing covariant pathways (Stage One Model) were retained to compensate for minor inter-item correlations.

6.4.4 Stage THREE Model: WRT, Distress, Equity and Practice Conditions

The addition of the latent variable, *wish-to-reallocate time* represented the final stage of the model building process. As with previous stages, variables significantly associated with the wish to reallocate time constructs were tested for inclusion in the model. However, the building of the third stage of the model proved more contentious than either the Stage One or Stage Two models, requiring a refinement of the model first hypothesized and then supported by regression analysis (Figure 6).

6.4.4.1 The Initial Stage Three Model

The *Initial Stage Three* Model, incorporated the single latent variable, *wish to reallocate time (WRT)*, based on the four sub-scales: Scholarly Practitioner, Health Team Member, Knowledge Seeker, and Practice Manager (Figure 10).

With the addition of WRT, a significant ($p < 0.000$) and substantial ($R = 0.58$) association was seen with distress (Appendix 7). This association was comparable to the

association seen with the Main Pathway model (Figure 7), though slightly weaker. Significant associations were also found with: *coping with time demands* ($p < 0.002$), and *time currently allocated to administrative activities* ($p < 0.001$). The correlation between coping and WRT ($R = 0.28$), and between time allotted to administrative activity and WRT (0.27) contributed equally to explaining WRT variance (R^2). Distress and the two exogenous variables explained 66 percent of the variance associated with the wish to reallocate time. Only one covariance was found to be significant; the remuneration process and time allocated to administrative activities ($R = 0.171$), with more time in administration associated with less fairness in the remuneration process ($p < 0.009$). Again, insignificant covariant pathways were retained.

This model produced mixed Goodness-of-Fit statistical results (Appendix 7). Although the Norm Fit Index and Incremental Fit Index indicated a good fit, the P value was significant ($p = 0.039$). However, a significant P value is not itself an indicator of poor fit as the value is affected by the size of the sample (Arbuckle and Wothke, 1999). Both the P for Test of Close Fit (0.860) and the RMSEA value (0.037) were within acceptable limits, and the Hoelter 0.05 Index (247) was greater than the minimum sample size limit of 200.

Of greater concern was the fact that the critical ratios for two of the wish to reallocate time parameters were not significant, indicating a higher than acceptable level of error; *Knowledge Seeker* ($p = 0.059$) and *Practice Manager* ($p = 0.686$). Based on these results, the model was rejected and an alternative model had to be considered.

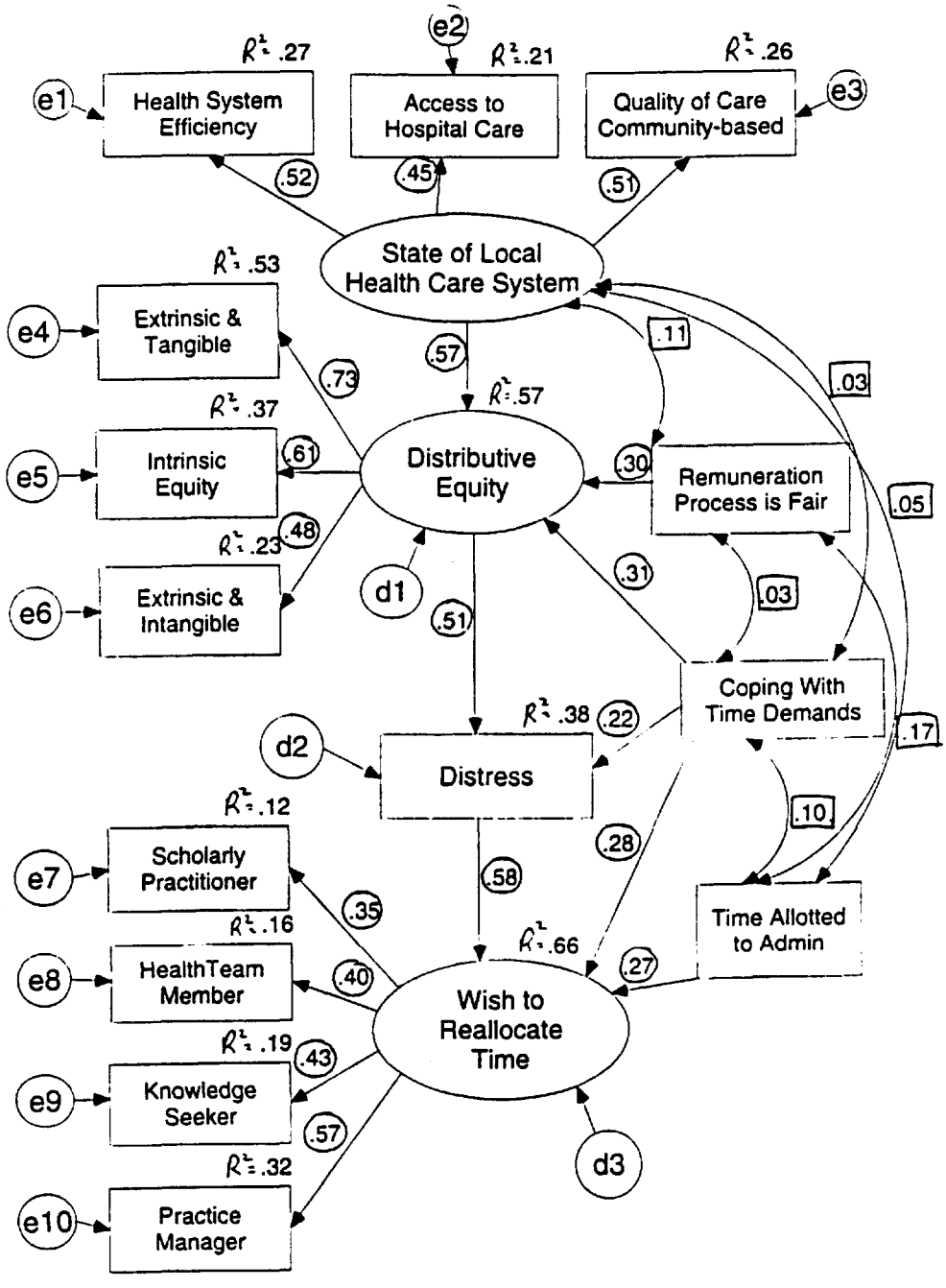

Figure 10: *Initial Stage THREE* Structural Equation Model

Note 1: Values inside circles represent path coefficients
Note 2: Values inside squares represent covariant correlations
Note 3: Except where indicated (e9 & e10) all critical ratios are highly significant ($p < 0.001$)

6.4.4.2 Alternative Stage Three Model

Given the critical ratio of the scale, *Practice Manager*, it was removed from the latent variable and introduced into the model as a measured construct. The WRT latent variable, reduced to three components *(Scholarly Practitioner, Health Team Member and Knowledge Seeker*), was renamed *Wish to Reallocate Professional Time* (WRPT).

The *Alternative Stage Three Model* (Figure 11) produced much better Goodness-of-Fit statistics (Appendix 8). The Norm Fit Index (0.991) and Incremental Fit Index (0.998) indicated a good fit and the P value was not significant ($p = 0.088$). Discrepancy per degree of freedom (1.241) was within the accepted limit of less than 2, and the Hoelter 0.05 Index (251) was greater than the minimum sample size. In addition, P for Test of Close Fit was excellent at 0.927 (1.00 = best possible fit). The RMSEA (0.032) was less than 0.05. Indices were similar to, and in some cases better than, those reported for the *Stage Two* model.

In addition to the associations and pathways established with equity (Stage 1) and distress (Stage 2), significant relationships were found between distress and both the latent ($R = 0.44$) and the exogenous ($R = 0.39$) time reallocation variables.

With the conceptual split in wish to reallocate time between professional and administrative activities, new model pathways emerged. Coping with time demands correlated somewhat higher with WRPT, but not at all with *Practice Manager*. Not surprisingly, time currently allocated to administrative tasks was related to *Practice Manager* ($p < 0.000$), with more time associated with a greater wish to reallocate that time, but was not associated with WRPT. Combined, distress and the coping explained

38 percent of the variance associated with WRPT. Distress and time for administrative activities explained 23 percent of variance associated with *Practice Manager*.

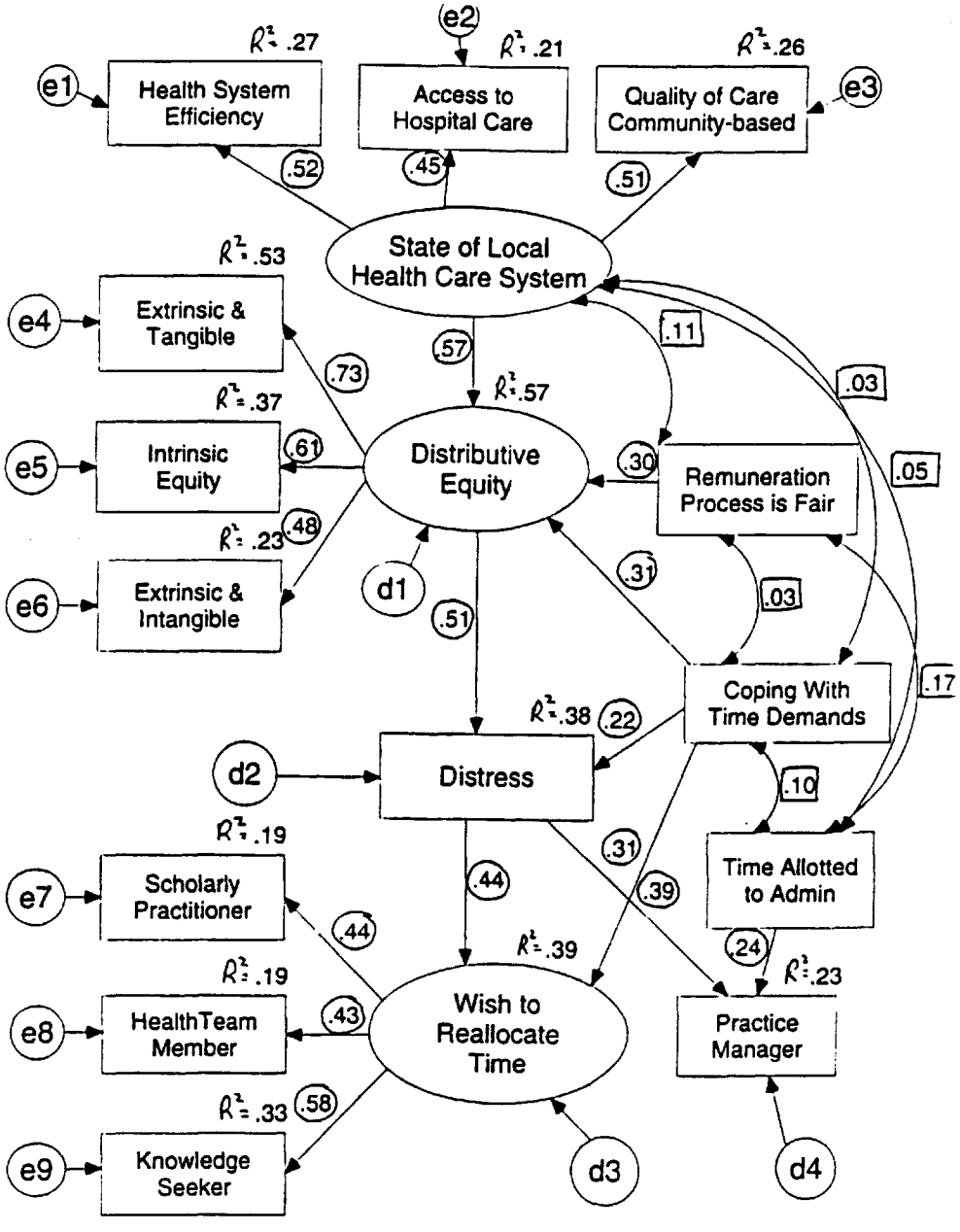

Figure 11: Alternative *Stage THREE* Structural Equation Model

Note 1: Values inside circles represent path coefficients
Note 2: Values inside squares represent covariant correlations
Note 3: Except where indicated (e9 & d4) all critical ratios are highly significant ($p < 0.001$)

However, in the Alternative Stage Three Model, problems continued with the critical ratios of the intercepts. Although the removal of *Practice Manager* appeared to improve *Knowledge Seeker* within the new WRPT variable ($p < 0.021$), Practice Manager was still not significant ($p = 0.948$). Despite the favourable Goodness-of-Fit indices, the Alternative Stage Three Model was also rejected in favour of a third and final model.

6.4.4.3 Final Stage Three Model

As a further extension of the conceptual separation between Professional and Administrative activities, the original 5 point scales measuring the wish to change the time allotted to: 1) practice paperwork; and 2) attending meetings and writing reports (Appendix 2: Follow-up Questionnaire), were used to create a new latent variable. *Wish to Reallocate Administrative Time* (WRAT). WRAT was analysed along with WRPT as two separate endpoints in the model.

The *Final Stage Three* Model (Figure 12) produced very good Goodness-of-Fit statistics (Appendix 9). The Norm Fit Index (0.991) and Incremental Fit Index (0.999) indicated a good fit, and the P value was not significant ($p = 0.112$). Discrepancy per degree of freedom (1.196) was within the accepted limit of less than 2, and the Hoelter 0.05 Index (255) was greater than the minimum sample size. In addition, P for Test of Close Fit was excellent at 0.965 (1.00 = best possible fit), and the RMSEA (0.029) was less than 0.05, with even the upper bound limit less than the 0.05 level of significance. Indices were similar to, and in some cases better than, those reported for the *Stage Two* model.

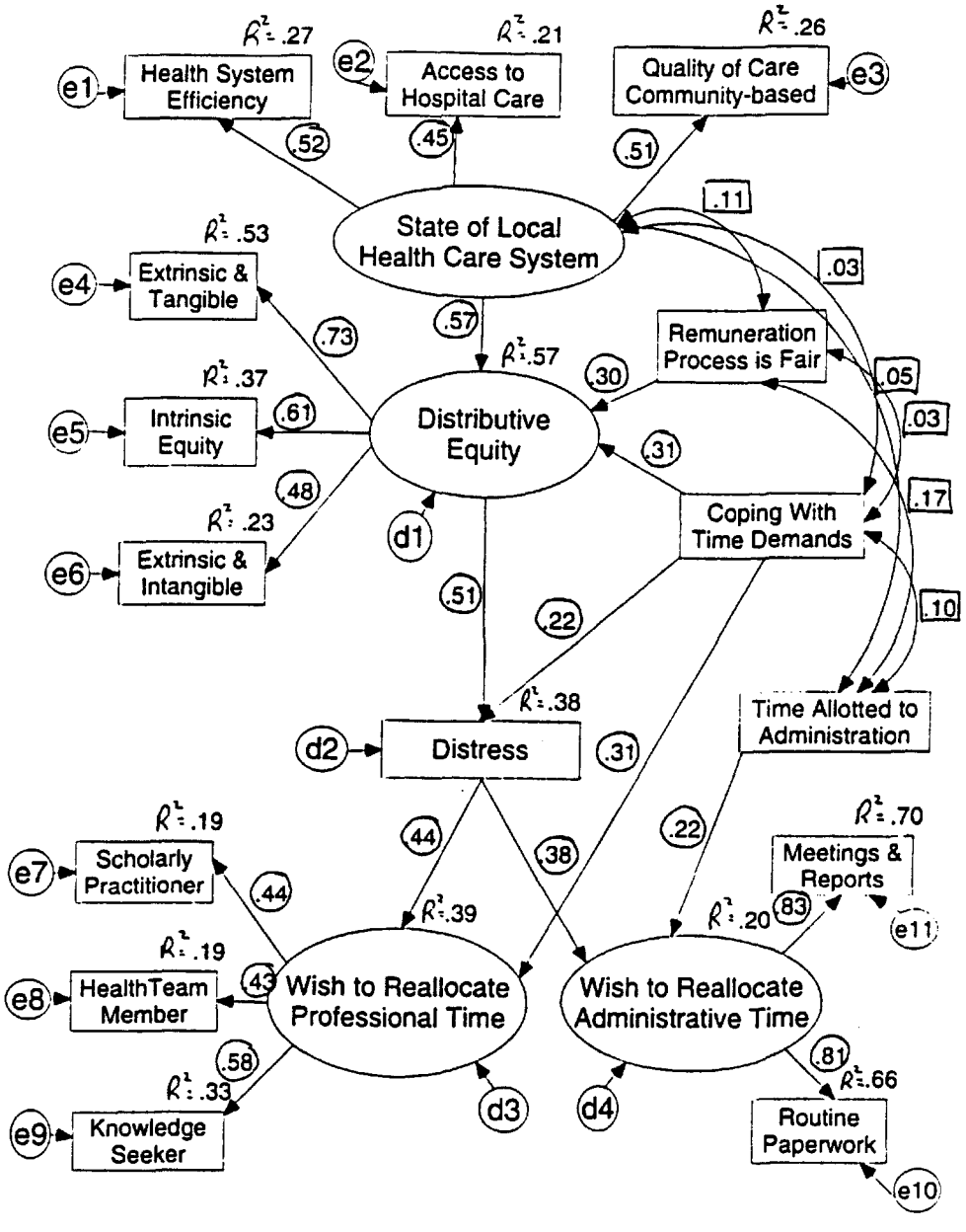

Figure 12: *Final Stage THREE* Structural Equation Model

Note 1: Values inside circles represent path coefficients
Note 2: Values inside squares represent covariant correlations
Note 3: Except where indicated (e9) all critical ratios are highly significant ($p < 0.001$)

The pathways previously reported as significant were still significant in the *Final Stage Three* model. Combined, distress and coping continued to explained 39 percent of the variance associated with WRPT. Distress and time allotted to administrative activities explained 20 percent of variance associated with WRAT. Perhaps more importantly, critical ratios for all intercept, mean, and variance parameters were significant. With the exception of *Knowledge Seeker* which was significant ($p = 0.021$), all parameters were highly significant ($p = 0.000$).

6.4.5 Summary

The goodness-of-fit statistics for the main pathway model and each stage of the model building process are summarized in Table 6.4. 5. For the most part, the relationships and contributions of significant exogenous variables and latent variables using SEM were consistent with those found in the various linear regression models. SEM was superior to MLR analysis in that it allowed the hypothesized complexity of the relationships between: practice conditions, equity, distress and wish to reallocate time, to be more fully explored and expressed.

Because of the ability of SEM to remove error from the model, there is the possibility that the relationship between the latent variables: wish to reallocate time (professional and administrative), equity, local health care system, and other exogenous variables have been overstated. Conversely, the relationship may have been understated in earlier regression models due to the weak reliability of some of the constructs.

Table 6.4.5 Summary of Goodness-of-Fit Statistics for Multi-stage Model

Goodness-of-Fit Indices	Good Fit Values	Main Path	Stages 1	Stages 2	Stage 3 Initial	Stage 3 Alternative	Stages 3 Final
Discrepancy	-	24.585	25.481	30.234	88.696	83.164	94.514
Degrees of Freedom	-	19	16	22	67	67	79
P	> 0.05	0.175	0.062	0.113	0.039	0.088	0.112
Number of Parameters		25	28	32	52	52	56
Discrepancy / df	< 2.0	1.294	1.593	1.374	1.324	1.241	1.196
Normed Fit Index	1.000	0.996	0.996	0.995	0.991	0.991	0.991
Incremental Fit Index	1.000	0.999	0.998	0.999	0.998	0.998	0.999
Parsimony Ratio	0.000	0.528	0.444	0.489	0.638	0.638	0.658
FO	< 0.05	0.023	0.040	0.034	0.091	0.068	0.065
FO Lower		0.000	0.000	0.000	0.005	0.000	0.000
FO Upper		0.094	0.114	0.112	0.210	0.182	0.184
RMSEA	< 0.05	0.035	0.050	0.040	0.037	0.032	0.029
RMSEA Lower		0.000	0.000	0.000	0.009	0.000	0.000
RMSEA Upper		0.070	0.085	0.071	0.056	0.052	0.048
P for Test of Close Fit	1.000	0.718	0.463	0.668	0.860	0.927	0.965
Hoelter 0.05 Index	> 200	294	247	269	235	251	255
Hoelter 0.01 Index	> 200	352	301	319	261	279	282

In addressing these concerns, commentators have been somewhat equivocal about the use and limitations of SEM and of latent variables. However, Maruyama (1998) observed,

> ". . . the logic of reliability correction is the heart of multiple-indicator, latent variable SEM. Those techniques . . . produce a generally effective way in which to address problems of random error by estimating reliability in terms of the specified model."
>
> *Basics of Structural Equation Modelling, p. 87.*

Given concerns about the reliability of some of the constructs associated with this study, specifically *health team member* and *extrinsic intangible equity*, the use of latent variables would seem to be an appropriate method by which to improve reliability and to prevent the understating of important relationships. The potential for overstating relationships must be acknowledged, but should not preclude the empirical exploration of these relationships using latent variable SEM .

Based on analysis using linear regression and structural equation modelling, there is support for the hypothesized multi-stage model of the relationship between equity, distress and the physician's wish to reallocate time. Practice conditions make a contribution to the relationship, but for the most part its affects occur in relation to the perception of equity, only indirectly affecting distress and the wish to reallocate time. The exceptions were: coping with time demands, which was also associated with distress and the wish to reallocate professional time; and time allocated to administrative activities, which was associated with the wish to reallocate administrative time.

7 Discussion

The overall objective of the study was to model the pathway between equity, distress and the wish to reallocate time, and to determine the contribution of practice conditions to this model. Previous modelling of the relationship between wish to reallocate time and equity had not considered distress as an intervening variable, but looked only at the relationship between equity and wish to reallocate time (Dobson, 1997). Analysis using structural equation modelling provided strong evidence of a pathway from equity to wish to reallocate time, with distress serving as the intervening or intermediate step.

The validity of the main pathway of *equity*, *distress* and *wish to reallocate time* is supported empirically by the work of VanDierendonck et al. (1994, 1996), and Bakker et al. (2000) in their investigations of the relationship between patient demands and attitudes, perceptions of equity among general practitioners, and emotional withdrawal by these physicians from their patients. However, their research did not consider the potential for physicians to reallocate their time or how practice conditions, aside from the attitudes and demands of patients, might affect perceptions of equity and the distress that unresolved inequity can produce.

Understanding the process by which physicians seek to allocate their time is especially relevant at a time when the health care system is attempting to redefine the role

of physicians and other health care providers (Fyke, 2001). Due to the key position occupied by physicians within the system, finding ways to support the appropriate allocation of the physician's time will be essential to insuring the efficient delivery of quality health care (Morrison, 2000). By identifying practice conditions that support physician equity and the best allocation of their time, it may be possible for physicians to achieve professional and personal objectives in a manner that is congruent with broader health system objectives.

7.1 Equity and Practice Conditions

Hypothesis I: Controlling for physician characteristics, there is no significant association between practice conditions and perceptions of equity among physicians: *Equity* $\neq$ *f(Practice Conditions, Control Variables)*

The Objective Practice Environment: The literature suggested objective environmental factors, such as community size, location, ownership, and group size might affect intrinsic and extrinsic rewards, thus contributing to the perception of equity (Eisenberg, 1994). This association was only partially supported by these findings. Significant relationships were seen between intrinsic equity and community size ($p < 0.05$), specialty designation ($p < 0.001$), and group size ($p < 0.01$). Significant associations with extrinsic equity (tangible or intangible) were limited to sponsorship ($p < 0.05$) sponsorship with extrinsic tangible equity .

Smaller centres often lack the infrastructure and resources to allow physicians the opportunity to treat more interesting and complex cases (Shride, 1997; Eisenberg, 1994;

Riley et al., 1991; Morrisey et al., 1991; Langwell et al., 1987); therefore, the perceived lack of intrinsic equity in smaller centres, relative to larger centres, is not surprising. For many years, researchers and policy makers have been aware of the practice of patients "leap-frogging" or by-passing services available in their community in favour of travelling to larger centres (Lepnurm & Lepnurm, 2001; Murray & Warren, 1986). Not only has this caused access problems in larger centres and the under utilization of services in smaller centres, but may be contributing to lower levels of intrinsic equity for physicians working in the smaller communities.

While there may be some disparity between small and large centres, the content of medical work is essentially the same in terms of the intrinsic benefits physicians receive relative to the work carried out across most communities in Saskatchewan and British Columbia ($p < 0.05$). In terms of intrinsic equity, only the very largest urban centre (i.e. Vancouver) differed from other communities. These findings are supported by the work of Ritchie et al. (1999), who found that urban surgeons had similar workloads to "rural" surgeons. Urban surgeons were seen to perform a few more tertiary-type procedures than their rural counterparts, with rural surgeons performing more total procedures (Ritchie et al., 1999).

Self-selection may explain the relative homogeneity of responses based on community size. Physicians, inclined to seek out positions offering more interesting and challenging patients, are more likely to possess greater skills and competencies than their less accomplished colleagues (Longest, 1996). Given the mobility enjoyed by Canadian physicians (Ryten et al., 1998), opportunities to move to a larger centre invariably exist

for more skilled physicians. In effect, many physicians are in a position to pursue and obtain sufficiently challenging and interesting work that is commensurate with their abilities and need for accomplishment.

Despite efforts to provide additional financial incentives and other tangible benefits to physicians in smaller centres, physicians working in these smaller centres did not assess their extrinsic tangible equity to be greater than that of their "big city" colleagues. This is consistent with other research which found physicians place little weight on financial rewards when deciding to locate to a smaller centre (Lin et al., 1997). Greater weight is given by physicians to less tangible factors, such as spousal opinion, time off and collegial interaction (Lin et al., 1997). Current remuneration policies appear to be sufficient to the extent that physicians perceived equity of extrinsic tangible rewards to be similar regardless of community size.

The effects of a single public payer for physician services and widely held social attitudes among other stakeholders toward physicians may also explain the lack of significant differences in extrinsic equity between communities of different sizes. With some exceptions, primarily new physicians in over-serviced areas (Levine, 1997), a single payer system has meant that the same fee is collected for the same procedure or activity regardless of where it occurs within a province. Although the effort required to carry out these tasks may differ across communities (Hamilton, 1995), it does not appear to be sufficient to cause a significant difference in the perceptions of physicians about the fairness of extrinsic tangible rewards. Although respect and appreciation for physicians may be declining (Hafferty & Light, 1995), it would appear, as perceived by physicians,

that these extrinsic intangible attributes are similar, regardless of community size.

Not surprisingly, general practitioners indicated significantly less intrinsic equity compared to specialists ($p < 0.001$). Due to their own attitudes and training, changing patient expectations, and more limited access to diagnostic services, general practitioners often find it necessary to refer more complex (and often more interesting) patients to their more specialized colleagues (Montouris, 2000; Allery et al., 1997; Howe, 1996). Technical specialists, such as anesthesiologists, pathologists and radiologists, also reported more intrinsic equity compared to other physicians including cognitive specialists, procedural specialists, and general practitioners ($p < 0.01$).

Particularly interesting was the lack of association between specialty and extrinsic tangible equity. Financial rewards have historically favoured specialists, especially procedural specialists (Schroeder, 1992). Significant differences were anticipated, but were not found in this study. The lack of a significant difference between general practitioners and other specialist groups may indicate a shift in the relative financial rewards of these physicians, with less disparity between groups. This is not to say that general practitioners are better rewarded for their efforts than in the past. Instead, it may indicate that specialists now perceive a similar balance or imbalance between their inputs and these extrinsic tangible rewards.

Alternatively, the higher incomes enjoyed by physicians compared to other professional groups (Rosen, 1989), and the increasing demands placed on all health care professionals (Buchan, 1999; Corey-Lisle et al, 1999; Boon, 1998), may help to offset perceptions of financial inequity between the different physician specialty groups.

Being part of a practice group rather than a solo practitioner was associated with higher ratings for intrinsic equity ($p < 0.01$). The benefits of working in a group may be due to its effect on the workload, the call schedule, and professional interaction, as well as lifestyle and the time available for family activities (Langwell et al., 1987).

The size of the practice group was also seen to be important. Physicians in groups of 5 to 7 reported higher intrinsic equity than other group sizes ($p < 0.05$). At the same time, groups of 3 to 4 physicians indicated less intrinsic equity than other groups, including "groups" of only one or two practitioners ($p < 0.01$). Although cognitive specialists were more likely to practice in a large group, no differences were seen between groups, based on specialty, that might explain group size differences in intrinsic equity. As well, the distribution of groups of 3 to 4 physicians, and groups of 5 to 7 physicians were the same for communities of more than 500,000 and those less than 500,000. In addition to group size being associated with intrinsic equity, there is also an optimal group size for the medical practice of between 5 to 7 physicians.

A possible explanation may be that smaller practice groups are less able to employ economies of scale, limiting their capacity to delegate activities to support staff compared to larger practice groups (Williams et al, 1997). With a smaller number of physicians in the group, less intrinsically rewarding tasks are harder to avoid (Woodward et al., 1996; Breslau et al., 1978), and by necessity must be performed by the physicians who make up the practice group.

The Subjective Practice Environment: For many Canadians, the funding constraints of the 1990s adversely affected their perceptions about the state of the health

care system (CCHSE, 2000). Health care workers are no different, and physicians, in particular, have voiced their concerns regarding declining quality and poorer access (Hamilton, 1995). The physician's assessment of the state of the local health care system was expected to make a significant contribution to both intrinsic and extrinsic equity perceptions. This association is also suggested by Arnetz (1997, 1999), who found that the actual work environment was important in determining how physicians perceived their workload and working conditions.

Whether assessed in terms of efficiency, access, quality of services, cooperation among health care providers, or the level of participation in local health policy and planning, the study found that items used to measure the state of the local health care system, as perceived and reported by the study physicians, were significantly related to distributive equity. Unlike objective environmental characteristics, such as group size or ownership, these associations were similar across intrinsic, extrinsic tangible and extrinsic intangible equity. The physician's perceptions of the local health care system, particularly the quality of services, were strongly related to equity perceptions.

Practice Integration: In recent years, physicians have begun to move away from the fee-for-service, stand alone medical practice (Frank et al, 1997; Kletke et al., 1996). More physicians are seeking the security of a salaried income and the support provided by large, integrated health care organizations (Montague, 1994). Although the traditional cost sharing arrangement was the most common form of practice arrangement among survey respondents, it was significantly associated with less tangible extrinsic equity

The manner in which physicians organize themselves to share practice costs and revenues affects their perception of extrinsic equity. This finding is supported by the presence of an association between practice arrangement and extrinsic equity. Physicians indicating a cost sharing arrangement indicated less extrinsic tangible equity ($p < 0.001$) and less extrinsic intangible equity ($p < 0.05$). No association was found between practice arrangement and intrinsic equity. The present trend toward more economically integrated practice arrangements may contribute to a better balance between physician inputs and outcomes derived from external sources, but is not associated with the intrinsic value of the work of physicians. Physicians appeared to link the content of their work to how they arranged themselves to deal with the economic aspects of the practice.

A great deal of debate has centred around the use of other health professions to improve the effectiveness and efficiency of the health care system by reducing the inappropriate utilization of physician services (Buknoda, 1996; Bezjak, 1987; Temkin-Greener, 1983). Within the medical profession, some physicians view the greater use of these "substitutes" with some trepidation (Barton et al., 1999); perceiving these increasingly influential groups as an economic threat, as well as a threat to clinical autonomy. Among the physicians responding to the survey, greater intrinsic equity was associated with a higher rate of referral to other health care providers ($p < 0.05$), as well as health support workers, such as psychologists and social workers ($p < 0.01$).

Perhaps, physicians who choose to use, or have access to, other service providers are better able to delegate less intrinsically rewarding activities, or activities requiring greater effort. If the concerns of physicians about the use other provider groups as the

principle health care provider can be dealt with successfully, both the patient and the physician could benefit.

Practice Demands: Given the contribution of inputs to the perception of equity (Major & Testa, 1989), one would anticipate a strong association between practice demands and equity (Lawler & O'Gara, 1969). Therefore, the general lack of association was somewhat surprising. Total hours of work and time spent on continuing medical education showed only a weak association, and although the proportion of patients with personal problems was associated with the level of equity ($p < 0.05$), the contribution of practice demands, *per se,* was relatively minor.

This lack of association might be explained by the fact that a demanding practice may be more involving, and therefore, may be intrinsically more interesting to the physician (Ben-Sira, 1986). Practice demands are certainly perceived by some physicians as a positive, rather than a negative aspect of being a physician. A more demanding practice may also serve as a signal to some physicians that the need for medical services is great, giving them a greater sense of accomplishment (Huseman et al., 1987). In this case, ambiguity over the assigning of a practice demand, either an input or as a reward, may explain the lack of association with equity.

Alternatively, the weak association between equity and various practice demands might be due to physicians adopting a psychological strategy for restoring equity (Walster & Walster, 1975). When confronted with substantial barriers to change, a person in distress may attempt to redefine the value attached to inputs and outcomes as a way to reestablish equity (Hatfield & Sprecher, 1984). If having a large number of difficult

patients is seen as unavoidable, the physician may be inclined to redefine the workload's effect on the exchange as a way to maintain equity.

Conversely, the survey respondents, in comparing themselves to other physicians, may have perceived their practice demands and the associated rewards to be similar to other physicians (Dornstein, 1989). Reference groups (those one compares oneself to) help the individual establish the conditions necessary for an equitable exchange, as well as defining acceptable levels of inputs and rewards (Molm et al., 1993). While expressing concerns about workloads, a physician may see the situation as the same for most physicians; even for most health care workers, and objectively high workloads may not represent a particularly important source of inequity (Major & Testa, 1989).

In assessing the role of demanding patients, the physician's share of clinically complex and socioeconomically disadvantaged patients were not related to the level of equity, but probably for different reasons. As alluded to previously, clinically complex patients represent both a demand and a reward for the physician (Cook et al., 1995; Ben-Sira, 1987), and as such, can result in ambiguous responses (Huseman, 1987). Low socioeconomic status, while associated with greater health care needs (Terris, 1992), may not represent an additional demand for the physician. This interpretation is supported by the fact that, despite a greater need for such services among the poorer citizens of our society, the utilization of health services is similar across socioeconomic groups (Mhatre & Deber, 1992).

On the other hand, the proportion of patients with personal problems was associated with the physician's perception of equity ($p < 0.05$). Patients with emotional

problems have been associated with higher rates of utilization (Angel & Angel, 1997), and dealing with personal problems is often time consuming for the physician (Roter et al., 1995). Effectively dealing with a patient's personal problems can be challenging and with the possible exception of psychiatry, tends to fall outside the physician's areas of competency (Durand, 1994). Physicians with a greater proportion of patients with personal problems may view this as an excessive or unfair practice demand because they lack the time and requisite skills.

Practice demands, even if not perceived as unfair, can be onerous if they exceed the physician's ability to cope. Individuals unable to cope with practice demands are more likely to seek ways to reduce these demands (Van Yperen, 1996). In effect, it may not be the amount of work or the level of demand which affects the physician's perception of equity, but rather the extent to which the physician is capable of dealing with these demands.

For the physician with the requisite clinical and coping skills, higher workloads may be associated with greater rewards, both extrinsic and intrinsic. For other physicians, with fewer skills and less physical and/or emotional capacity, a similar workload could constitute an important input for which the rewards may or may not be available, or desired. This is somewhat analogous to the entitled-benevolent continuum hypothesized by Huseman et al. (1987). However, instead of preferences determined by personality type, it may be the capacity of the physician to handle the demands of the practice which determines whether practice demands are perceived as a significant input factor or as a reward.

In coping with time demands, a highly significant association was found with equity ($p < 0.001$). This is most evident with intrinsic equity ($R = 0.312$). A diminished ability to cope may be reducing the time available to carry out intrinsically rewarding activities or reducing the actual benefits associated with these activities.

Remuneration: The role of remuneration cannot be overlooked in assessing equity in an economically-linked exchange. Historically, the remuneration of most medical services has been based on a fee-for-service payment model. Although fee-for-service has been acknowledged as unfair; favouring procedural specialists and the provision of discrete medical procedures (Victoria Report, 1995), this method of remuneration continues to be the dominant method of reimbursement among physicians (CCHSE, 2000). Under fee-for-service, general practitioners and cognitive specialties such as internal medicine are seldom compensated for spending more time with a patient, and the majority of physicians are not compensated for carrying out activities not perceived as contributing directly to individual patient care (Wright, 1996).

Among the physicians surveyed, the four items associated with remuneration were all found to be significantly associated with overall equity. However, the actual method of payment ($p < 0.05$), whether the physician thought the method of payment appropriate ($p < 0.05$), and the ability to change the method of payment ($p < 0.05$) seem to be of only minor importance. In particular, the relatively weak association between equity and the *method of remuneration* supports earlier work which found the method of pay made only a minor contribution to the physician's perception of equity (Dobson & Lepnurm, 2000).

On the other hand, the perceived fairness of the process of determining the rate of remuneration for different specialty groups was expected to contribute to the perception of distributive equity (Lind & Tyler, 1988; Tyler et al., 1985), and was subsequently supported by the data ($p < 0.001$). Conceptually different from distributive equity (Greenberg, 1990), the substantial contribution of the remuneration process ($R = 0.328$) emphasizes that remuneration should not only be fair, but that it should be seen to be fair.

Interestingly, analysis of the data indicated that among the four specialist groups, procedural specialists rated the process used to determine remuneration less fair than other groups, despite their apparently preferential position (see Appendix 10 for analysis). This might be explained by changes occurring in the relationship between the provincial plans and medical associations, and between groups of physicians within the medical associations.

In the past, strong representation by general practitioners on the boards of most provincial medical associations helped to offset a bias for procedurally-based specialty services (Katz et al., 1997). Over the years, however, procedural and technical specialists became increasingly more efficient and were able to increase their incomes through greater productivity. While general practitioners and cognitive specialists secured greater fee increases for the services they were providing, they were not able to exploit the efficiencies realized by their more technically driven colleagues. Now, as provincial governments place greater emphasis on continuity of care and case management (Fyke, 2001), the demand for general practitioners and cognitive specialists needed to carry out these functions is expected to increase. Subsequently, greater demand for their services

may allow general practitioners and cognitive specialists to seek a larger share of the funds allocated for physician services.

In practical terms, general practitioners and cognitive specialists may not see substantial increases in their income levels due to ongoing efforts by most provincial governments to constrain physician expenditures. However, the strategies used to constrain physician expenditures are more likely to be applied to procedure-based specialties. While the favouring of general practitioners and cognitive specialists may be appropriate, other physician groups experiencing a relative decline in their traditional rewards are more likely to perceive increased inequity. At this point, procedural specialists are more likely to perceive the process as unfair. To ameliorate this response, it will be necessary to ensure that the process by which these changes occur is open to scrutiny and seen to be fair by all physicians, especially procedure-based specialties.

Overall Contribution of Practice Conditions to Perceptions of Equity: Practice conditions were expected to make a substantial contribution to the physician's perception of equity. Of the three equity sub-scales, 36.6 percent of the variance associated with intrinsic equity was explained by practice conditions, the ability to cope, and the control variables. This was followed by extrinsic tangible equity at 29.3 percent and intangible extrinsic equity at 17.1 percent. Practice conditions, coping with time demands, and the control variables explained 40 percent of *Overall Equity* variance. Among the practice conditions variables, community size, specialty, quality of community and long term care services, practice arrangement, the sharing of medical records, and fairness of the process used to determine remuneration all made significant contributions to the overall equity

construct.

Of the practice condition variables found to contribute to overall equity, the items associated with the practice environment made the most substantial contribution ($R^2 = 0.148$), followed by the remuneration process ($R^2 = 0.124$). Coping with time demands ($R^2 = 0.070$) and items associated with practice integration ($R^2 = 0.058$) were seen to be responsible for the remainder of the explained variance.

Although the model of intrinsic equity was comparable to overall equity and explained a large proportion of variance ($R^2 = 0.366$), the models of extrinsic equity (tangible and intangible) were substantially different and were less effective in explaining variance. Not surprisingly, the importance of the remuneration process was most evident in association with extrinsic external equity ($p < 0.001$).

By comparison, there was no association between the fairness of the remuneration process and extrinsic intangible equity. The process of setting remuneration rates for services rendered continues to be the preserve of physicians, their professional associations and the government (Katz et al., 1997). Given that other stakeholders, such as patients, nurses and administrators, do not play a role in the remuneration process, the lack of association with intrinsic and extrinsic intangible equity is not unexpected.

Although aspects of the practice environment, such as community size and specialty, are not particularly amenable to change, perceptions about the state of the local system and the other practice conditions may be susceptible to some degree of modification. Changes in how physicians are organized, the remuneration process and the types of clinical and managerial support provided to them, as well as information on

the relative performance of the health care system have the potential to improve overall equity perceptions.

7.2 Distress, Equity and Practice Conditions

Hypothesis II: Controlling for physician characteristics and practice conditions, there is no significant association between distress and perceptions of equity among physicians:
Distress = f(Equity, Practice Conditions, Control Variables)

The Objective Practice Environment: Based on theory and empirical evidence, a perception of inequity will lead to distress, which serves to motivate the individual to restore equity (Bakker et al., 2000; Hatfield and Sprecher, 1984). However, the distress reported by physicians may also be caused by other factors associated with the medical practice. The physician may experience distress if professional responsibilities and activities associated with the practice cannot be handled in a timely manner, or if the physician lacks the skills necessary to effectively carry out certain tasks.

Different practice environments promote specific practice conditions and expectations (Donaldson, 1997; Childs,1997). In different practice environments, therefore, it might be easier or more difficult for physicians to meet their professional and personal obligations. It may also be more difficult to eliminate activities contributing to the level of distress experienced by the physician.

From this reasoning, it was anticipated that different aspects of the physician's practice environment, whether perceived as fair or unfair, might be associated with a higher level of distress. Based on the study findings, however, any association between

practice environment and distress would appear to be relatively weak. Among the objective practice environment variables tested, only speciality and practice sponsorship were significantly associated with distress.

The least distressed of the specialist groups were the technical specialists ($p < 0.01$). This might be explained by the fact that the work of technical specialists, such as radiologists, anaesthesiologists, and pathologists is relatively uncharacteristic of the profession. As a group, physicians often experience long working hours, erratic schedules and excessively demanding patients (Arnetz, 2001). Technical specialists, on the other hand, often have more routinized work and more predictable work schedules than other physician specialty groups (Ritchie et al., 1999; McAvoy et al., 1999; Chan et al., 1998). Being able to focus on a more technical area of expertise and the ability to plan ahead would appear to be beneficial in terms of the distress reported.

The study found that non-physician practice sponsorship was associated with less distress among the physicians surveyed ($p < 0.05$). Many physicians are opting to become employees, rather than owners of the medical practice (Kletke et al., 1996). Reasons for this trend include: more predictable schedules and income levels; and greater opportunity for collegial contact and support (Montague, 1994). The trend toward being a salaried or employee physician is especially prevalent among young, new-to-practice physicians (Kletke et al., 1996); possibly due to changing attitudes about the relationship between professional and economic autonomy (Coburn et al, 1983), and the desire for more personal time (Sullivan & Buske, 1998). The findings of this study seem to support the suggestion that the perceived benefits of this type of practice sponsorship are real; in

that physician ownership of the practice was associated with more distress. Greater levels of distress were possibly due to the administrative responsibilities associated with running the practice as a business, and the additional financial risks associated with ownership.

The Subjective Practice Environment: The distress reported by physicians in this study appeared to be affected by the state of the local health system, particularly on issues relating to access and quality of health services. The health reforms of the 1990s and the push to constrain costs and inappropriate utilization have caused many people, including physicians, to express concern over the state of health care in Canada (CCHSE, 2000; Hamilton, 1995). Many physicians have also expressed concern over a lack of consultation regarding changes being made in the healthcare system (Gutkin, 1997).

It has been suggested that concerns about health reform has politicized physicians (Sibbald, 1998; Weissenstein, 1998). Therefore, the distress reported by physicians might be due, in part, to limited opportunities to participate in these processes, or distress might be pushing physicians to participate more. The distress reported by physicians was not associated with either a lesser or greater rate of participation by physicians in the local policy or planning process. The perceived ability to participate in decisions affecting the local health care system did not contribute to the level of distress reported by physicians.

Practice Integration: While many physicians continue to work within the solo practice setting, the long term organizational trend has been toward group practice (Ubokudom, 1998). Within these groups, physicians often adopt a cost-sharing arrangement in which they are responsible for generating sufficient revenues to cover

their share of the costs and to provide an income for themselves (Williams et al, 1997). Due to the relative financial security and flexibility offered by revenue-pooling arrangements (Montague, 1994), it was anticipated that practice arrangements limited to cost sharing would be associated with higher levels of distress. This supposition was supported by the study findings that showed physicians sharing practice costs had a significantly higher level of distress than physicians working in solo practice or organized to share revenues through some form of income pooling arrangement ($p < 0.001$).

The fact that solo practitioners also reported less distress might be explained by the fact that a relatively large number of solo practitioners in the study indicated non-physician practice sponsorship compared to physicians in cost-sharing arrangements (Appendix 10). As reported previously, non-physician sponsorship was significantly associated with less distress, and this may explain why solo practitioners, as a group, reported less distress. In fact, after controlling for the affect of practice sponsorship, no significant difference was seen between solo and cost-sharing practice arrangements. However, the difference between cost-sharing and revenue sharing remained significant.

Being able to refer patients to the appropriate care provider should reduce the distress associated with a physician's practice due to the ability to shift workloads, and the increased ability to focus on tasks better suited to the physician's expertise (Fyke, 2001; Woodward et al., 1996). Alternatively, physicians may view other providers as a threat to their clinical autonomy (Buknoda, 1996), and their traditional role of patient advocate (Gutkin, 1997). Physicians may also perceive other provider groups as a threat to their economic well-being (Cooper, 2001; Arnetz, 2001).

Distress was found to be inversely associated with the rate of referral by the physician to other health care professionals ($p < 0.01$), and to health support workers such as psychologists and social workers ($p < 0.001$). The practice of referring patients to other health workers appeared to have a beneficial effect on the physician's level of distress and concerns over the use of these professional groups may be less important. Alternatively, physicians who are less distressed may simply be more inclined to refer their patients to other provider groups. In this case, creating a more equitable medical practice may serve to reduce distress and promote health system integration at the same time.

Greater practice integration, as measured by revenue sharing and referral to other provider groups, was associated with less physician distress. However, some physicians may find themselves in a situation where the adoption of new practices is not feasible (Ubokudom, 1998). The inability of the physician to change practice arrangements, and the lack of individual control it represents, may be a further source of distress (Johnson et al., 1995). This was confirmed by this study which found that physicians who believed they could not easily change their practice arrangement reported greater distress in association with their medical practices ($p < 0.05$).

In promoting a more integrated health care system, physicians may need to feel that they have some influence over the rate and nature of change as a way to reduce the level of distress. Newly proposed integrated health care systems, while promoting less traditional practice arrangements, greater financial security, and the use of non-physician health care providers and community support workers, should have some flexibility in

their organizational design to allow for choice and movement between different practice arrangements.

Practice Demands: Higher workloads were expected to be associated with higher levels of physician distress. This is based on the fact that heavier workloads place greater demands on the physician, while reducing the flexibility of reallocating practice time (Rout & Rout, 1994; Howie et al., 1989). This study found that only the number of working hours was associated with distress. However, even this association was relatively weak ($p < 0.05$)

The relative affluence of physicians may help to explain these findings. Despite recent constraints, physicians are one of the highest paid groups of workers in Canada. (Colohan, 1996). With less of an economic imperative to work long hours, physicians distressed by their hours of work are better able to adjust their level of participation compared to other workers. It is possible, therefore, that only physicians with recent concerns about their workload levels, or those with little control over their hours of work, would be distressed by their current hours of work. Much like their ability to control their total hours of work, the time allocated to any one activity, if deemed excessive, may be open to modification. Alternatively, physicians may not be distressed with the actual time allocated to each of these functions. In other words, physicians may prefer to be engaged in other activities, but the amount of time currently spent on each activity is not a source of great concern, in and of itself.

Dealing with difficult patients can be particularly challenging for physicians (Calnan et al., 2000). Therefore, it was anticipated that having more clinically complex

patients, socially disadvantaged patients, or patients with personal problems would be a source of distress. However, either due to the clinical focus of most physicians (Sullivan & Buske, 1998; Chan et al., 1998; Cook et al., 1995), or due to the fact that poverty is less of an indicator of demand within a health care system (Wilkins and Park, 1997; Mhatre & Deber, 1992), clinically difficult and socially disadvantaged patients were not associated with distress. In effect, most physicians would seem to possess the skills or resources needed to ameliorate the impact of these types of patients.

Furthermore, the ambiguity of clinically difficult patients, as both a source of effort and reward for the physician (Huseman et al., 1987), may have diminished its aggregate affect on the level of distress. However, the general lack of training among physicians to effectively deal with the patient's personal issues (Roter et al., 1995; Durand, 1995), may explain why patients with personal problems were a source of distress for many physicians.

In addition to the actual workload, the ability of physicians to cope with workload was anticipated to be linked to their level of distress (Arnetz, 2001). A significant and substantial association ($p < 0.001$; $r = 0.395$) was found between coping and distress. The capacity to deal effectively with their time demands appeared to be an important contributor to the level of distress reported by physicians. Furthermore, the physician's ability to cope had relatively little to do with the current demands of the practice. Subsequent analysis of the relationship between hours of work and coping found no significant relationship. Those with higher workloads were not more likely to report an inability to cope.

Remuneration: Given the concerns expressed by physicians about appropriate methods of pay (Sullivan & Buske, 1998), it was anticipated that issues relating to the method of remuneration and the ability to change one's method of pay would be associated with distress. However, only the process by which remuneration was determined had a significant impact on the level of distress reported ($p < 0.01$).

The literature and the findings of this study clearly establish the association between distributive equity and distress (VanDierendonck et al., 1994, 1996; Bakker et al., 2000). In this study, the fairness in the process used to allocate remuneration was also associated with the distress reported by physicians ($p < 0.05$). While associated with distributive equity, the process of determining the distribution of rewards is a different concept. While distributive equity refers to what makes up the exchange, process equity refers to the procedures used to determine what is to be exchanged (Greenberg, 1990). Both process and distributive equity were associated with the distress reported by physicians.

Overall Contribution of Equity and Practice Conditions to Distress: Having determined the contribution of practice conditions to the perception of equity among physicians, the next step was to establish how practice conditions were likely to affect the relationship between equity and distress. Among the practice condition variables, a number of significant relationships with distress were identified, including: specialty group, sponsorship, local health services access and quality, practice arrangement, ability to change practice arrangement, rates of referral to allied professions and health support workers, hours of work, patients with personal problems, the physician's ability to cope

with time demands, and the remuneration process.

Including the three equity sub-scales in the regression analysis eliminated most of the practice condition variables from the distress model. Only specialty, share of complicated cases and coping remained significant. Specialty and share of complicated patients remained in the model because they were not significantly associated with overall equity. Coping with time demands was significantly associated with equity, but was also related significantly to distress independent of equity.

For the most part, practice conditions contributed indirectly to the distress reported by physician by affecting the perception of equity, which in turn was strongly associated with distress. Coping was the main exception to this general finding, indicating that individual physician characteristics have a more direct affect on the level of distress experienced by the physician. At the same time, these individual characteristics may also affect the perceived level of equity.

7.3 Wish to Reallocate Time: Reacting to Practice Conditions

Hypothesis III: Controlling for immutable and mutable physician characteristics, practice conditions, and perceptions of equity , there is no significant association between distress and the wish to reallocate time (WRT) among physicians:
WRT = f(Distress, Equity, Practice Conditions, Control Variables)

As a behavioural response to inequity (Geurts et al., 1998), *wish to reallocate time* is being considered as the direct manifestation of the distress created by inequity. It was also anticipated that practice conditions would affect the manner in which physicians responded to perceived inequities. However, the professional objectives of the physician

may also affect how they respond to practice conditions. For example, if physicians find current time allocations inappropriate for the tasks they want to carry out, they may be motivated to reallocate their time toward those activities seen to support their perceived roles and responsibilities (Hensel & Dickey, 1998), rather than as a means to correct inequity *per se*.

Physicians who perceive themselves as clinicians may want to spend more time in patient care, whether or not their situation is perceived as equitable. Similarly, physicians perceiving teaching and research as critical to their professional development will be inclined to spend time on these activities. The professional obligations and expectations of physicians, therefore, must be given due consideration when interpreting the study findings in relation to the wish to reallocate time.

The Practice Environment: It was anticipated that constraints associated with different aspects of the practice environment would affect the ability of the physician to reallocate time based on personal preferences (Donaldson, 1997), and this inability was expected to manifest itself as a wish to reallocate time, independent of equity or distress. However, little evidence was found to support this hypothesis. Although a number of associations were seen between the practice environment and the wish to reallocate time at baseline, these associations were weak, and could not be replicated at follow-up.

While analysis failed to show a relationship between wish to reallocate time and practice environment, it was anticipated that environmental constraints might be associated with the time currently allotted to patient care, teaching and research, continuing medical education, and administration. Simple linear regression analysis was

carried out using current time allocations as the dependent variable to assess the strength of this relationship (Table 7.3).

Table 7.3 Contribution of Environment to the Time Allocated to Professional Activities

Dependent Variables	Patient Care	Teaching & Research	CME	Admin
R	0.266	0.554	0.000	0.305
R^2	0.071	0.307	0.000	0.093
Adjusted R^2	0.059	0.286	0.000	0.078
n	240	240	240	240
Model	Standardized Beta Coefficients			
Community Size				
< 25,000	-	-0.233***	-	-
25,000 to 99,999	-	-0.360***	-	-
100,000 to 499,999	-	-	-	-
> 500,000	-0.146*	-	-	-
Location	-0.180*	0.370***	-	-
Ownership	-	-0.145*	-	-
Specialty				
General practitioner	-	-0.172*	-	-
Cognitive	-	-	-	-
Procedural	-	-	-	-
Technical	0.225**	-0.264***	-	-
Group Size				
1 or 2 Doctors	-	-	-	-
3 to 4 Doctors				-
5 to 7 Doctors				-0.144*
8 or More Doctors				-0.275***
Access to Hospital Services	-	-0.194*	-	-
Cooperation Among Providers	-	-	-	0.168*
Quality Community Services	-	-	-	-0.140*

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Items representing the practice environment explained only a small portion of the variance in the time currently allotted to patient care ($R^2 = 0.059$) and administration ($R^2 = 0.078$), and none of the variance associated with continuing medical education ($R^2 = 0.00$) . A number of practice environment variables did make a substantial contribution to the time currently allotted to teaching and research ($R^2 = 0.286$).

Physicians participating in the study and indicating a greater amount of time devoted to teaching and research were invariably more likely to be located in larger centres, have their primary office located in a hospital, and indicate better access to hospital-based services for their patients. The association between the practice environment and time allocated to teaching and research is understandable given the infrastructure and resources required to carry out these function (Pardes, 1997). Typically, such resources and support have not been available to the physician practising in the community or in a smaller hospital.

The disparity between groups of specialists carrying out teaching activities may be explained, in part, by the community-based practice of general practitioners. Historically, general practitioners working in the community were not called on to carry out formal teaching duties. Most medical training was carried out by specialists based in large regional hospitals and tertiary-care institutions (Relman, 1983). It recent years, this has begun to change as more attention is given to community-based training and the delivery of effective primary care (Gray et al., 2001; Colohan, 1996). This has led to the expansion of medical training programs to include physicians working in smaller centres where general practitioners make up the largest physician contingent (Whiteside &

Mathias, 1996; Gray et al., 1994; Barer & Stoddart, 1992b). In the future, the effect of practice environment on the ability of the physician to take on a greater teaching role may be less important, depending instead on the interests of the individual practitioner.

On the other hand, differences in the time spent on teaching and research between general practitioners and other specialties may be a manifestation of the priorities of the medical-industrial complex (Relman, 1983). The push for innovative pharmaceuticals and technologies not only drives up the costs associated with health care (Evans, 1992), but also represents the source of substantial profits for research-based, pharmaceutical companies and equipment manufacturers (Bassett, 2000). By ensuring greater acceptance of new products, clinical trials have become an effective method of marketing new drugs and technologies (Evans, 2000), and physicians associated with these trials tend to rise in stature within the profession.

In the drive for new, more profitable therapies, opportunities for physicians to participate in clinical research will vary across specialties. Due to a general lack of training in research methods, and a practice orientation less conducive to adopting innovative, leading-edge technologies, there are fewer opportunities for general practitioners to participate in research compared to other groups of physicians (Mainous & Hueston, 1995).

Technical specialists participating in this study (pathologists, radiologists and anaesthesiologists) also indicated that they did less teaching and research than other physicians. Unlike the general practitioners, the reasons for this lack of participation was less apparent. Yet, among the radiologists at least, it has been suggested that rapidly

expanding workloads, a lack of recognition, and inadequate compensation have made these activities less attractive (Samuel & Shaffer, 2000).

In summary, the current allocating of time to most physicians activities is best explained by a preference-oriented approach (Westert and Groenewegen, 1999). That is to say, physicians have general goals and specific objectives and can often ignore or overcome environmental factors to achieve these goals and objectives. However, *teaching and research*, with its significant association with various environmental factors, appears to conform more to a constraint-driven explanation of behaviour (Lindenberg, 1990). In effect, variations in time allocation are explained by differences in practice conditions that provide incentives or restrict choice. Time allotted for teaching and research appear to be more dependent on the specific environmental opportunities and constraints compared to other professional activities.

Practice Integration: The degree to which the medical practice is integrated within the larger health care system was expected to influence the wish to reallocate time. Greater awareness of new roles and the ability to take on new roles should be enhanced in practice settings where the risks and workloads are shared, and where other providers are available to assume responsibility for the patient's care (Williams et al., 1997).

The findings of this study offer some evidence that physicians are less likely to seek changes in time allocation within a more integrated practice model. Those working in revenue sharing practice arrangements were less likely to indicate a wish to reallocate time ($p < 0.05$). Those more likely to refer their patients to other health care providers were also less likely to express the wish to reallocate their time ($p < 0.05$). Greater

security and flexibility in the medical practice may also reduce the wish to reallocate time because physicians are already able to change time allocations to reflect their own preferences.

The findings of the study also indicated that an inability to change the present practice arrangement was associated with the wish to reallocate time ($p < 0.05$). Unable to change their practice arrangement, physicians may be more inclined to seek change in the content of their work. If resistance to change extends beyond the organizational arrangement to other aspects of the practice, this may help to explain a greater wish to reallocate time among these physicians.

Practice Demands: Higher workloads and practice commitments can limit flexibility and prevent the physician from reallocating time (Camasso & Camasso, 1994). Therefore, it was anticipated that the wish to reallocate time would be greater among those physicians currently constrained by their workloads and current time allocations.

Practice demands may influence the wish to reallocate time. This was based on the significant correlations found between wish to reallocate time and total hours of work, time currently allotted to patient care, teaching & research, and administrative activities, and proportion of patients with personal problems. However, given the weak associations between equity and the practice demands, and between distress and practice demands, the relationship between practice demands and wish to reallocate time appears to be a separate phenomenon.

In a study of pediatric surgeons, Bouchard and Laberge (1997) found that among physicians generally satisfied with their work, there was a preference to reallocate time

toward patient care, teaching and research, and away from administrative activities. These preferences were attributed by the investigators to be a general desire to reduce workloads, rather than a dissatisfaction with the work itself.

The capacity of the physician to cope with the demands of a medical practice may also determine the extend to which they would prefer to allocate their time among various activities (Camasso & Camasso, 1994). As a result, physicians who are better able to cope with practice demands should be less inclined to allocate time from duties for which they have already assumed a responsibility.

The inability of the physician to cope with current time demands was also found to be a strong indicator of the physician's wish to reallocate time ($p < 0.001$; $r = 0.356$). Aside from its contribution to a more equitable exchange, physicians appear to have an additional incentive for reallocating time; to support their ability to cope by reallocating time away from professionally less attractive activities (Bouchard & Laberge, 1997).

Remuneration: Given that most physicians are paid primarily by fee-for-service (Sullivan & Buske, 1998) and that their level of income depends on time spent providing discrete patient care services (Feldham et al., 1994), one would expect salaried and fee-for-service physicians to have different preferences in terms of how they would wish to reallocate their time. However, the method of remuneration, agreement with the method, ability to change the method of pay, and the fairness of the remuneration process were not associated with the wish to reallocate time. As with practice environment and practice organization, this set of practice conditions did not appear to be substantially related to the wish to reallocate time.

The lack of association between the method of remuneration and the wish to reallocate time was especially unexpected. The desire to reallocate time did not seem to be fundamentally connected to issues relating to physician remuneration, although income has traditionally been an important aspect of equity assessment. Remuneration and extrinsic tangible equity are important considerations, but the wish to reallocate time may be equally or more strongly determined by the intangible and intrinsic aspects of the work of physicians.

Overall Contribution of Practice Conditions to the Wish to Reallocate Time: Among the practice condition variables, the wish to reallocate time was significantly related to: quality of long term care services; the practice arrangement; referral to allied and supporting health care providers; hours of work; time allocated to patient care, teaching and research, and administration; proportion of patients with personal problems; and coping with time demands. Inclusion of distress into the model supplanted most of the practice condition variables.

In addition to distress, *wish to reallocate time* was also found to be associated with the practice condition variables of specialty, practice arrangement, practice arrangement appropriateness, and hours of work, as well as the proportion of time teaching, the proportion of time in administration, and the ability to cope with practice demands. Despite initially strong associations between the wish to reallocate time scales and the equity scales, equity failed to contribute to the regression model once distress was added. Distress was indeed the intervening variable as hypothesized, subsuming equity and indirectly reflecting the physician's wish to reallocate time.

7.4 The Multi-stage Model: The Role of Equity in the Allocation of Time

Based on equity theory, it was hypothesized that physicians would wish to reallocate time in response to the distress caused by perceptions of inequity. The empirical work of Bakker, VanDierendonck and their associates (2000, 1996, 1994), regarding changes in physician attitudes toward the patient suggested the appropriate SEM methods. The structural equation modelling resulted in a model explaining more of the variance associated with the wish to reallocate time than could be explained using more traditional constructs and simple linear regression. At the same time, the fundamental relationships and pathways revealed by SEM were consistent with, and built upon, the results produced using simple linear regression.

SEM produced a well-fitted model that explained a substantial amount of variance at each stage of the model, and confirmed the primary pathways hypothesized. The contribution of the practice conditions to the model, however, was shown to relate almost exclusively to the equity stage of the model. The exceptions were *ability to cope*, which contributed significantly to equity, distress and the wish to allocate professional time (WRPT), and *time allotted to administrative* which made a significant contribution to the wish to reallocate administrative time (WRAT).

To some extent, the general lack of association between practice conditions and the main pathway did not conform to the model originally hypothesized. Still, *state of local health care system* and *remuneration process is fair* did make substantial contributions to explaining variance in distributive equity among physicians. The model also identified the contribution of the individual physician's ability to cope at each step of

the pathway, from perceiving inequity, to experiencing distress, to the wish to reallocate time.

This study was able to link practice condition variables to equity and demonstrate the subsequent contribution to distress and a desire to reallocate time among professional activities. Furthermore, this study found that current time allocations were relatively unconstrained by the practice conditions, in particular, environmental factors that are more likely to be resistant to change. Physician ratings of the local health care system and the remuneration process were significantly associated with the perception of equity, which in turn was shown to be associated with distress experienced by the physician and their wish to reallocate their time. These factors are more amendable to change, either by the system managers and policymakers, or by the physicians themselves.

The distress experienced by physicians and others in association with their work environment and its impact on health and quality of life has been the focus of a number of researchers (Bosma et al., 1998; Theorell et al., 1998; Johnson et al., 1995; Schweitzer, 1994). Those looking at the role of equity in generating distress have tended to focus on the consequences of inequity for patient-physician relationships (Bakker et al., 2000). At the same time, consideration of the factors contributing to inequity, such as patient attitudes, were seen to be relatively resistant to change. The focus of attention has been on providing symptomatic relief from the distress resulting from inequity rather than addressing the underlying conditions creating the distress. The model created in this study suggested that, given the contributing factors, fundamental changes in the perceived fairness of the practice environment are possible.

Perhaps the most interesting and unexpected finding in building the model was the splitting of wish to reallocate time construct into two distinct components of the time allotted to activities carried out in association with the medical practice. The wish to reallocate professional time (WRPT), in addition to its strong association with distress, was also associated with coping with time demands. The wish to reallocate administrative time (WRAT), on the other hand, was associated with time currently spent on administrative activities and was not associated with coping with time demands. Physicians distressed by inequity in the practice setting may be less likely to consider a strategy of time reallocation of their professional activities provided they are currently able to cope with the demands of the practice.

The wish to reallocate administrative time was unaffected by the physician's ability to cope. While similarly affected by the distress associated with unfair practice conditions, the physicians appeared less willing to persist with administrative activities. The preference for spending less time on administrative activities was also associated with a larger administrative load. Unlike professional activities, coping strategies are less likely to promote physician participation in administrative activities. Professional training and societal obligation may cause physicians to continue other professional activities in the face of an unfair exchange, but administrative functions are not likely to be given the same consideration.

The findings of the study reinforce the idea that most physicians perceive their primary role to be that of a skilled medical practitioner, and don't particularly associate this role with administrative activities. At the same time, there does not appear to be a

strong desire to trade off administrative duties to spend more time on professional activities. Although there was some correlation between WRPT and WRAT, the association was not significant. Perhaps this speaks to a general feeling among physicians that they are over-worked (Sullivan & Buske, 1998).

A simple desire to work less in the future was noted by Bouchard and Laberge (1997). Rather than simply shifting time to other professional or administrative activities, physicians may wish to reduce their time commitments, with a preference to reducing administrative activities. While this wish to work less may be a wider trend, those reporting greater inequity were also more inclined to wish to reallocate both professional and administrative time.

8.0 Conclusions

The study conclusions are presented in two parts. First, equity theory and its implications for organizational theory will be presented. This will be followed by possible implications for the health care system in the application of equity theory.

8.1 Applying Equity Theory: Implications for Organizational Theory

The most plausible theoretical explanation of the relationships found in this study from a organization theory perspective is strategic choice theory. Strategic choice theory holds that the perceived contribution of a factor to achieving specific goals determines its influence rather than any objective impact of the factor on achieving an outcome (Child, 1997). In the *Final Stage Three Model* of equity-distress-wish to reallocate time, no association was demonstrated between perceptions of equity and the objective characteristics of the external practice environment. The strongest associations were with items measuring the state of the local health care system as perceived by the physicians rating quality, access and efficiency. In effect, physicians were unaffected by their environment unless assigned importance by the physician.

Based on strategic choice theory, decisions of how to organize the practice to achieve desired outcomes is *evolutionary*, with new structures and processes emerging as those within the organization gain experience with, and are changed by, the existing

organization and the external environment (Ranson et al., 1980). Success is less determined by what is actually required, than by what is perceived to be needed. The study findings support the contention that physicians are relatively free to create an organizational arrangement based on their understanding of the environment.

At the same time, more deterministic organizational theories explaining physician behaviour cannot be rejected outright. Although environmental factors were not constraining most physician behaviour to a substantial degree, physicians may choose to adopt certain organizational structures to conform with widely held preferences and expectations (Scott, 1987).

The association between objective environmental factors and the current use of time (Table 7.3) and the gradual adoption of more appropriate new organization arrangements (Williams et al., 1997) gives support to contingency theory (Donaldson, 1997). However, constraints on current practices seem to be limited to physician participation in teaching and research activities. Other activities were not associated with the external environment. As a result, physicians are still able to carry out these tasks independent of the external environment. There appears to be little connection between organization of the medical practice and the behaviour of physicians; both in terms of how time is allocated or how physicians would wish to allocate their time. However, as the *organizational liberality* enjoyed by physicians erodes, they may find it necessary to adopt more efficient practice structures and processes.

As with contingency theory, resource dependence theory supported some of the study findings, but did not seem to provide a good explanation. Maintaining equitable

arrangements is an important aspect of resource dependence theory (Van de Ven & Walker, 1984), and less acceptable environmental conditions were expected to be associated with perceptions of inequity. The significant associations between equity and the physician's assessment of the local health care system and the remuneration process supports the need for physicians to be aware of the practice environment, and its impact on their ability to achieve preferred outcomes. However, if time allocation behaviour is determined by the practice environment, one would expect to see a significant relationship between these environmental conditions and the wish to reallocate time. No associations were found; physicians perceiving inequity were not seeking to influence the quality of the environment through time reallocation.

Institutional theory, in explaining the influence of environment, argues that the structure of an organization is merely a reflection of the larger social institution in which the organization exists (Scott, 1987). Institutional theory argues that the success and survival of the organization is linked in compliance with, and a reflection of, the larger institution rather than the optimal performance of the organization (Meyer & Rowan, 1977). The physicians in this study were inclined to adopt traditional arrangements such as solo practice and cost-sharing medical practice groups which can limit access to other providers and supportive infrastructure. Despite the expressed wish of governments to change the health care system, physicians do not appear to be inclined to comply. Instead, they seem to be holding on to established practices and arrangements.

Institutional theory also suggests environment and organizational variables represent potential sources of inequity, but if these factors conform to broad institutional

orthodoxy, their impact on equity should be relatively weak. There was some support for this position, in that a very strong association was seen between equity and the state of the health care system. A system in transition does not match with orthodoxy, and the adverse consequences of reform may be interpreted as unfair to the physician.

Despite the apparent impact of practice arrangement on equity and the physicians level of distress, physicians were less likely to be working in a more integrated practice model. Although the environmental signals indicate that a more integrated model is inevitable as well as beneficial to patient care and the physicians' own working conditions, many of the physicians in this study reported practising in an organizational arrangement that was less advantageous to themselves and their patients.

Although environmental conditions seem to be pushing physicians toward a new practice model, the new model does not necessarily comply with the preferred model of most physicians. Strategic choice explains this ongoing incongruence as a manifestation of physicians' particular understanding of the environment and their ability to react to it independent of any overriding imperative for improved performance.

8.2 Applying Equity Theory: Implications for the Health Care System

This study also sought to identify actual practice conditions that affected perceptions of equity or were likely to affect the physician's wish to reallocate time. Unlike patient attitudes and demands, which may be beyond the influence of the physician, practice conditions may be more amenable to change, thereby enhancing equity and reducing or preventing distress.

In reacting to inequity, the high degree of autonomy exercised by physicians within health care permits a wide range of time reallocation strategies which may not necessarily support the evolving health care model. By evaluating the impact of practice conditions on equity and time preferences, it should be possible to identify and establish practice conditions which promote equity and collaboration, while supporting time allocation preferences that align with broader policy objectives.

Given the relationship between equity and the wish to reallocate time, the potential seems to exist to improve equity among physicians and to advance collaborative practices through better organizational models. However, such changes must be made in collaboration with physicians, given the inclination of many physicians not to support government led reforms and initiatives.

The study findings indicated that the time reallocation preferences of physicians favour a team-based clinical practice, with more time for research, teaching, and professional development (Table 8.2). Having more time for solo clinical practice, on the other hand, was not favoured by physicians; to the point that physicians seemed disinclined to change the time allotted to this activity.

Markedly less favoured by physicians were administrative tasks such as paperwork, attending committee meetings, and writing reports. Left to themselves, strategies adopted by physicians to restore equity are not likely to increase involvement by physicians in the administration of the system, although these activities represent the foundation upon which a more collaborative and integrated health care system can be implemented.

Table 8.2 Time Allocation Preferences of Study Physicians

Activity	Level of Activity Preferred (n=240)				
	Much More (%)	More (%)	No Change (%)	Less (%)	Much Less (%)
Assess & Treat Alone	2.5	15	66.3	15.4	0.8
Assess & Treat in Team	1.7	30.8	59.6	7.1	0.8
Communicating Care Plan	1.3	23.8	60	12.5	2.5
Counselling Patients	9.6	34.6	48.3	6.7	0.8
Research	7.9	30	56.3	5.4	0.4
Teaching	7.1	34.6	54.6	3.8	0.0
Reading Journals/CME	15.8	60.4	23.3	0.4	0.0
Rounds/Case Conferences	13.3	51.3	34.6	0.8	0.0
Practice Paperwork	1.3	6.3	27.5	46.7	18.3
Committee Meetings	0.4	4.2	31.3	40	24.2

As unattractive as administrative activities may seem to many physicians, they are necessary in a health care system increasingly concerned with evaluation and accountability (Mullin, 1998; Marriott & Mable, 1998). Computerization and automation will reduce or eliminate the time or effort associated with some of these administrative activities (Simpson, 1998), but given the key role of physicians within the health care system, their continued presence and committed participation in the management and administration of the system will be required for the efficient, effective and equitable delivery of health care services to Canadians.

The rewards associated with administrative activities will need to be enhanced, both in terms of: better remuneration associated with these duties; better training to carry

out these duties; and greater recognition of the importance of these activities (Swartz & Pogge, 2000). Physicians must also come to see these activities as an important component of their role as a physician, and not merely time taken away from the practice of medicine. By improving both tangible and intangible rewards, as well as the perceived importance of these activities, physicians are more likely to consider administration activities to be an essential and rewarding use of their time. Furthermore, enhancing the ability of the individual to cope with the demands of the practice is also unlikely to reduce the desire to reduce or eliminate time spent on administrative activities.

Given the role physicians occupy within the Canadian health care system, meeting their equity concerns will be an important key to a successful transition in the organization of the system and in the delivery of quality care. However, one must be cautious not to interpret from the findings that perceptions of inequity will automatically push physicians toward more collaborative models of care. For example, researchers in the United Kingdom found that physicians working in group practice spent less time counselling patients on preventive practices than solo practitioners (McAvoy et al., 1999). Group practice is an organizational arrangement that appears to support a more integrated health care system, but has the potential to reduce the tendency for physicians to adopt more appropriate practice patterns.

Among the physicians participating in this study, both solo and cost-sharing physicians indicated a desire to do more patient counselling compared to those in revenue sharing groups ($p = 0.013$). Furthermore, the wish to spend less time on administrative activities was evident in all three types of practice arrangements reported in this study

(solo, cost-sharing, revenue sharing), but was significantly greater among cost-sharing group practice physicians (paperwork, $p = 0.001$; meetings & reports, $p = 0.006$). The adoption of group practice is widespread and increasing among physicians (Chan et al., 1998; Kletke et al., 1996). However, if this trend does not include revenue sharing, physicians may find they lack the ability or may feel less inclined to carrying out important preventive and administrative activities.

Physicians do seem inclined to adopt more integrative and collaborative practices within the current health care environment, but barriers to adopting such practices may lead to frustration and declining morale (Bakker et al., 2000). Persistent barriers to new practice patterns may cause distressed physicians to pursue less appropriate strategies for restoring equity. For example, they may choose coping strategies such as emotional or behavioural withdrawal from patients (Geurts et al., 1998; Van Dierendonck et al., 1994; Koehler et al., 1992), or choose to pursue greater financial rewards in order to restore balance to a exchange seen to be unfair.

Finally, the failure to promote equity may actually prevent the development of a more integrated health care system (Geurts et al., 1998). In supporting teamwork and a more collaborative work behaviour, Hatfield and Sprecher (1984) found that when rewards are equitable, workers were more likely to cooperate with one another for their mutual benefit. When rewards are perceived as inequitable, workers may choose not to cooperate and opt instead for individually defined tasks, even if this results in reduced levels of compensation (Hatfield & Sprecher, 1984)

If true, the response to inequity has important implications in a health care system where greater teamwork and cooperation between health professions are essential to the delivery of efficient, effective and equitable care (Mullin, 1998; Marriott & Mable, 1998; Sapsford, 1997). Because of their central role in the Canadian health care system, greater teamwork and integration within the system still depends to a large degree on the support and cooperation of physicians (Anderson, 1998). More collaborative and cooperative behaviour by physicians, in turn, will depend on the perceived fairness associated with working in the Canadian health care system.

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Glossary

Cognitive Specialists: dermatologists, internists (including physiatrists), neurologists, pediatricians (including medical geneticists) and psychiatrists

Coping: A four items scale measure the ability of the physician to cope with the demands of their work environment. Items included: 1) time to pursue special interest or hobby; 2) time to keep up with clinical specialty; 3) time to complete tasks without feeling rushed; and 4) ability to get a full night's sleep, with a reliability of 0.64.

Distress: A five item scale measuring the level of concern experienced by physicians about their work. Consisting of: 1) level of frustration when dealing with demanding patients; 2) fatigue experienced during the day; 3) level of frustration over gaining access to services; 4) the overall level of stress; and 5) the level of conflict between work and personal demands, with a reliability of 0.74.

Equity, Intrinsic: A four item scale measuring the rewards of physicians that are intrinsic in the work itself. Consisting of 1) *amount of interesting work, 2) sense of accomplishment from work, 3) extra effort worth the effort,* and *4) level of trivial activity,* with a reliability of 0.70.

Equity, Extrinsic Tangible: A four item scale measuring the tangible rewards physician receive for their work. Consisting of : 1) *pay reflects stress, 2) pay reflects experience, 3) equity of rewards* and *4) work to hard for rewards received,* with a reliability of 0.78

Equity, Extrinsic Intangible: A four item scale of non-monetary external rewards provided to physicians by others. Consisting of; 1) respect for physicians by nurses; 2) respect for physicians by administrators; 3) respect for physicians by patients; and 4) appreciation of patients for the effort of physicians, with a reliability of 0.58.

Equity, Overall: A global scale measuring perceived equity by physicians for the work they do. A eight item construct derived from the three equity sub-scales with a reliability of 0.81.

Health Team Member: A wish-to-reallocate time sub-scale measuring the wish of the physician to spend more or less time on team-based patient care activities. Consisted of three items: 1) assessment and treatment by you as part of a team; 2) communicating care plan to other health personnel; and 3) counseling patients on risk factors and health habits, with a reliability of 0.53.

Knowledge Seeker: A wish-to-reallocate time sub-scale measuring the wish of the physician to spend more or less time on maintaining knowledge. Consisted of two items: 1) reading medical journal, CME activities; and 2) clinical rounds, case conferences, with a reliability of 0.78.

Practice Manager: A wish-to-reallocate time sub-scale measuring the wish of the physician to spend more or less time on administrative activities. Consisted of two items: 1) completing paperwork associated with your practice; and 2) attending committee meetings, writing reports, with a reliability of 0.78.

Procedural Specialists: obstetricians and gynaecologists, otolaryngologists, ophthalmologists and surgeons (including general, thoracic, orthopedic, plastic & reconstructive, neurological and urological).

Scholarly Practitioner: A wish-to-reallocate time sub-scale measuring the wish of the physician to spend more or less time on individual practice and academic functions. Consisted team-based patient care activities. Consisted of three items: 1) assessment and treatment by you alone; 2) research; and 3) teaching, with a reliability of 0.68.

Technical Specialists: anaesthetists, pathologists and radiologists (including diagnostic and therapeutic)

Wish to Reallocate Time: A global scale measuring the wish of the physician to reallocate professional time regardless of the specific activity. Combines eight items measuring patient care, research and teaching, maintaining knowledge, and management functions into a single construct with a reliability score of 0.70.

APPENDICES

APPENDIX 1:

Baseline Questionnaire

MEASURING EQUITY IN THE WORK OF PHYSICIANS

Institute for Health and Outcomes Research
Department of Physical Medicine and Rehabilitation
University of Saskatchewan, 1998

Measuring Equity in the Work of Physicians

The objectives of this survey are 1) to seek the views of physicians on health care issues in Canada; 2) to measure equity in the work of physicians; 3) to identify how physicians allocate their time; and 4) to assess physician satisfaction with various aspects of their medical career.

A. Health Care: In this section of the survey, we are seeking your views on the state of the health care system in your community.

The QUALITY of the health care system in your community is:

Very Good	Good	Fair	Poor	Very Poor	Unable to Judge
❑	❑	❑	❑	❑	❑

The EFFICIENCY of the health care system in your community is:

Very High	High	Moderate	Low	Very Low	Unable to Judge
❑	❑	❑	❑	❑	❑

Please indicate your assessment of the ACCESS to specific services in your community using the following scales (please circle the appropriate response):

Community-based services	(Excellent	Good	Fair	Poor	Very Poor	No Opinion)
Hospital services	(Excellent	Good	Fair	Poor	Very Poor	No Opinion)
Long-term care services	(Excellent	Good	Fair	Poor	Very Poor	No Opinion)

COOPERATION among the different health care professionals in your community is:

Very High	High	Moderate	Low	Very Low	Unable to Judge
❑	❑	❑	❑	❑	❑

PARTICIPATION by physicians in POLICY AND PLANNING in your community is:

Very High	High	Moderate	Low	Very Low	Unable to Judge
❑	❑	❑	❑	❑	❑

Using the following grading scale please indicate your assessment of the QUALITY of specific services in your community (100 = the best, 0 = the worst):

Community-based services	(100	90	80	70	60	50	40	30	20	10	0	No opinion)
Hospital services	(100	90	80	70	60	50	40	30	20	10	0	No opinion)
Long-term care services	(100	90	80	70	60	50	40	30	20	10	0	No opinion)

1B. Health Policy: In this section we ask for your views on national health policy.

• Health care should be funded by a **single comprehensive** public health insurance plan provided to all residents in each province and territory of Canada.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	No Opinion
❑	❑	❑	❑	❑	❑

• For people in the workforce and their families, health care benefits should be financed by **employer and employee contributions** to health insurance funds.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	No Opinion
❑	❑	❑	❑	❑	❑

• People ought to be able to choose their health insurance plan from **competing for-profit and non-profit** plans.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	No Opinion
❑	❑	❑	❑	❑	❑

• The **range of benefits** in your existing provincial health care plan should be expanded to include additional services (eg. respite care, rehabilitation services/prosthetics).

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	No Opinion
❑	❑	❑	❑	❑	❑

• Public health insurance should be limited to treatments likely to cause **financial hardship**.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	No Opinion
❑	❑	❑	❑	❑	❑

• Health care expenditures should be directly linked to **private sector prosperity**.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	No Opinion
❑	❑	❑	❑	❑	❑

• Those willing to pay **out-of-pocket** to gain quicker access to health care in your province should be allowed to do so.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	No Opinion
❑	❑	❑	❑	❑	❑

• How have the following groups been affected by **health care reforms** in your province?

Physicians:	❑ Benefited	❑ No change	❑ Harmed	❑ No Opinion
Nurses:	❑ Benefited	❑ No change	❑ Harmed	❑ No Opinion
Administrators:	❑ Benefited	❑ No change	❑ Harmed	❑ No Opinion
Patients:	❑ Benefited	❑ No change	❑ Harmed	❑ No Opinion

2. **Equity:** In this section, we are seeking to measure levels of equity among physicians. Equity is defined as the fairness of the exchange between efforts and costs (inputs) and the value of the rewards (outputs) received. Please indicate your opinion in each of the following statements.

The INFLUENCE of physicians over health policy is:

Very High	High	Moderate	Low	Very Low	No Opinion
☐	☐	☐	☐	☐	☐

The level of RESPECT for physicians by

PATIENTS is:	(Very High	High	Moderate	Low	Very Low	No Opinion)
NURSES is:	(Very High	High	Moderate	Low	Very Low	No Opinion)
ADMINISTRATORS is:	(Very High	High	Moderate	Low	Very Low	No Opinion)

The amount of INTERESTING WORK in your daily activities is:

Very High	High	Moderate	Low	Very Low	No Opinion
☐	☐	☐	☐	☐	☐

The amount of time taken up by activities which do not contribute to your DEVELOPMENT AS A PHYSICIAN is:

Very High	High	Moderate	Low	Very Low	No Opinion
☐	☐	☐	☐	☐	☐

Presently your SENSE OF ACCOMPLISHMENT in daily activities is:

Very High	High	Moderate	Low	Very Low	No Opinion
☐	☐	☐	☐	☐	☐

How often do you feel that you WORK TOO HARD for the rewards received?

Very Often	Often	Sometimes	Rarely	Very Rarely	No Opinion
☐	☐	☐	☐	☐	☐

How often do you feel that MAKING THE EXTRA EFFORT is worth the rewards received?

Very Often	Often	Sometimes	Rarely	Very Rarely	No Opinion
☐	☐	☐	☐	☐	☐

Compared to other physicians, your share of DIFFICULT TO TREAT patients is:

Very High	High	Moderate	Low	Very Low	No Opinion
☐	☐	☐	☐	☐	☐

• How often do you feel that you give a great deal of attention to YOUR PATIENTS, but get little appreciation in return?

Very Often	Often	Sometimes	Rarely	Very Rarely	No Opinion
❑	❑	❑	❑	❑	❑

• How often do you feel that you give a great deal of attention to ADMINISTRATIVE DUTIES associated with your practice, but get little acknowledgement in return?

Very Often	Often	Sometimes	Rarely	Very Rarely	No Opinion
❑	❑	❑	❑	❑	❑

• Your level of financial compensation fairly reflects:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
the responsibilities you have.					
the experience you have.					
the effort you put forth.					
the stresses of your work.					

• The process used in your province to determine rates of reimbursement:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
fairly represents all areas of specialization in the deliberations.					
fairly represents all geographic areas in the deliberations.					
fairly represents you in the deliberations.					

• In general, the rewards for the work that you do are:

Excellent	Very Good	Good	Fair	Poor	Very Poor	Terrible
❑	❑	❑	❑	❑	❑	❑

3. Allocating Time

A. Managing Stress: In the course of managing your practice and attending to family and / or personal needs you:

	Very Often	Often	Sometimes	Rarely	Very Rarely
get regular exercise					
eat well balanced meals					
get enough sleep					
get tasks done without feeling rushed					
experience conflict between work commitments & personal / family responsibilities					
have time to keep up with developments in your clinical specialty					
experience fatigue during the day					
regularly interact with colleagues to discuss professional issues (besides referrals or consults)					

- How would you rate your level of stress? Very High ☐ High ☐ Moderate ☐ Low ☐ Very Low ☐
- How would you rate your overall health? Very Good ☐ Good ☐ Fair ☐ Poor ☐ Very Poor ☐

B. Monthly On Call Duties: Please estimate your call-backs **in an average month.**

Average Hours On-Call per Month [ ]

Location of On-Call activities	Number of Call Backs / Month	**Hours/Month** Hours spent / Month
Hospital Emergency/O.R.		
Hospital Ward/O.P.D.		
Chronic Care Facility		
Clinic		
Doctor's Office		
Patient's Home		
Other Call-Backs		

In an average month how many of the following telephone calls do you handle while On-Call?

Consultations over the phone	
Emergency Phone Calls	
Administrative Phone Calls	
Other Phone Calls	
ALL PHONE CALLS/MONTH	

What perentage of ALL On-Call Duties fall on the Weekend (after 6 on Friday)? [ ] %

C. Weekly Practice Duties (Excluding On Call) Please indicate the number of hours you devote to each activity, and whether you prefer to spend more or less time on these activities. We understand that some activities overlap. We seek your best estimates.

Total Hours Worked per Week	Hours / Week	Prefer to spend:		
How many hours / week do you usually spend on:		More	Same	Less
Providing Patient Care				
Assessment & Treatment carried out by you alone	hrs / week			
Assessment & Treatment carried out in a group:				
- with you in charge	hrs / week			
- with you assisting	hrs / week			
Communicating care plan to other health personnel	hrs / week			
Giving instructions to your patients about their therapies	hrs / week			
Counselling your patients on health habits	hrs / week			
Teaching and Research				
Supervision of residents / students	hrs / week			
Lecturing & demonstrating clinical techniques	hrs / week			
Instructing at workshops / colloquia / seminars	hrs / week			
Participating in research projects	hrs / week			
Maintaining Knowledge Base				
Participating in patient care conferences / rounds	hrs / week			
Reading medical journals / texts	hrs / week			
Attending clinical meetings related to QA, utilization	hrs / week			
Accumulating CME credits	hrs / week			
Management Functions				
Routine paperwork associated with your practice:				
- your own patients	hrs / week			
- activities of the practice group	hrs / week			
Administrative duties related to medical programs				
- writing of reports	hrs / week			
- committee work	hrs / week			
Other Duties: _____	hrs / week			

How much time during the week is taken up by phone calls?	hrs/week
About what percentage can be attributed to:	
talking with patients & their family members	%
physicians, nurses, & other health professionals	%
administrators & other health authorities	%
insurers, lawyers, employers & other third parties	%
	100 %

4. Satisfaction with Medicine as a Career: In the following questions we would like you to indicate your satisfaction with various aspects of your professional career.

The **predictability** of your work schedule.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
☐	☐	☐	☐	☐	☐

The **congeniality** of your practice setting.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
☐	☐	☐	☐	☐	☐

The **quality of resources** used to treat your patients.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
☐	☐	☐	☐	☐	☐

Your **ability to access** resources needed to treat your patients.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
☐	☐	☐	☐	☐	☐

The amount of **time available** to spend with your patients.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
☐	☐	☐	☐	☐	☐

The level of **awareness** you have about the lives of your patients.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
☐	☐	☐	☐	☐	☐

The degree of **trust** between you and your patients.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
☐	☐	☐	☐	☐	☐

- The level of **autonomy** over how you do your job.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
❑	❑	❑	❑	❑	❑

- Your level of **development** as a professional.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
❑	❑	❑	❑	❑	❑

- Your **involvement in developing** resources needed to treat patients in your community.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
❑	❑	❑	❑	❑	❑

- The level of **recognition** by your peers for the quality of your work.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
❑	❑	❑	❑	❑	❑

- The **variety in the work** that you do.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
❑	❑	❑	❑	❑	❑

- Your level of **income**.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
❑	❑	❑	❑	❑	❑

- Time available to be with your **family and friends**.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
❑	❑	❑	❑	❑	❑

- The ability to minimize **interruptions** to your time at home.

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
❑	❑	❑	❑	❑	❑

- In general, how satisfied are you with your medical career?

Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied
❑	❑	❑	❑	❑	❑

i. Your Practice

. Location of Primary Office:

- ❑ Downtown Residential
- ❑ Downtown Commercial
- ❑ Suburban Residential
- ❑ Suburban Commercial
- ❑ Community Hospital
- ❑ University Hospital
- ❑ Other _____

i. Community Size:

- ❑ < 5,000
- ❑ 5,000 to 9,999
- ❑ 10,000 to 24,999
- ❑ 25,000 to 49,999
- ❑ 50,000 to 99,999
- ❑ 100,000 to 499,999
- ❑ 500,000 to 1 million
- ❑ over 1 million

. Practice Sponsorship:

- ❑ Physician Group
- ❑ University Group
- ❑ Hospital
- ❑ Local Community Group
- ❑ Health Region / District
- ❑ Other _____

. Organizational Arrangements:

- ❑ Individual practice
- ❑ Share space and reception staff expenses
- ❑ Share space, reception and clinical staff expenses
- ❑ Share revenues, space, reception and clinical staff expenses
- ❑ Other: _____

e. Administrative Arrangements:

Do you have a rotation system for on-call coverage?

❑ Yes ❑ No

Does your group share medical records?

❑ Yes ❑ No

Working with other professionals in your practice and in your community:

Please indicate the TOTAL number of professionals in your practice

Professional Designation	Number
MDs: General practitioners	
MDs: Specialists	
Nurses	
Laboratory technicians	
Pharmacists	
Dietitians	
Social Workers	
Physical therapists	
Chiropractors	
Other:	
Other:	

For professionals NOT working in your practice please indicate the PRIMARY form of interaction with an (X) in the appropriate space.

Professional Designation	Face-to-face	Phone	Written	None
MDs: General practitioners				
MDs: Specialists				
Nurses				
Laboratory technicians				
Pharmacists				
Dietitians				
Social Workers				
Physical therapists				
Chiropractors				
Other:				
Other:				

g. What percentage of your reimbursement comes from the following methods?

☐ Fee-for service
☐ Salary
☐ Capitated rate per patient
☐ Sessional
☐ Other _____

100 %

h. Which is your PREFERRED approach to complex clinical decisions?

- ☐ To gather all of the relevant facts myself and make the clinical decision myself.
- ☐ To obtain information from relevant professionals and then make the clinical decision myself.
- ☐ To meet with the relevant professionals to discuss the case and then make the clinical decision myself.
- ☐ To meet with relevant professionals to discuss the case and then have the clinical decision made by the group

6. Topic of Interest: Evidence Based Medicine.

- The extent that physicians in your community use evidence-based medicine is:

Very High	High	Moderate	Low	Very Low	No Opinion
☐	☐	☐	☐	☐	☐

- In complex clinical cases how often do you search the clinical literature?

Always	Most of the Time	Sometimes	Rarely	Never
☐	☐	☐	☐	☐

- In reviewing journal articles how often do you assess the methodology section?

Always	Most of the Time	Sometimes	Rarely	Never
☐	☐	☐	☐	☐

- How would you rate your own knowledge of methodology issues in assessing journal articles?

Excellent	Good	Adequate	Needs Improvement	Needs Substantial Improvement	Unable to Judge
☐	☐	☐	☐	☐	☐

- In searching the clinical literature how often do you use MEDLINE or equivalent?

Always	Most of the Time	Sometimes	Rarely	Never
☐	☐	☐	☐	☐

- In your opinion, the potential for evidence-based medicine to improve clinical outcomes is:

Greatly Overrated	Overrated	Neither Overrated nor Underrated	Underrated	Greatly Underrated	Unable to Judge
☐	☐	☐	☐	☐	☐

. Demographics

. **Main area of specialization:**

_____

b. Additional areas of practice:

_____

_____

How old are you? _____ years

d. Gender: ❑ Female ❑ Male

How many years have you been practising? _____ years

Did you work prior to entering medical school? ❑ Yes ❑ No

. **If YES to (f),** What position? _____ How many years?_____
What position? _____ How many years? _____

. **Living Arrangements:**

❑ Living alone
❑ Living with spouse/partner
❑ Living with parent or relative
❑ Living with spouse/partner & parent or relative
❑ Other _____

i. Dependents:

Ages of Children still living with you

____ , ____ , ____ , ____ , ____

Ages of dependent adults living with you

____ , ____ , ____ , ____ , ____

If living with someone, how many days/week do they work outside the home?

❑ On a full-time basis
❑ 3 or 4 days each week
❑ 1 or 2 days each week
❑ not working outside the home

. What issues should be covered in follow-up surveys?

'ank-you for your cooperation in this study. The results will be analysed and reported in broad groups to protect e identity of individual physicians. Your identity will be held in strictest confidence.

APPENDIX 2:

Follow-up Questionnaire

Measuring Equity in the Work of Physicians

University of Saskatchewan
2000

Measuring Equity in the Work of Physicians

The objectives of this survey are 1) to seek the views of physicians on health care issues in Canada; 2) to measure equity and stress in the work of physicians; 3) to identify how physicians allocate their time and organize their practices; and 4) to assess physician satisfaction with various aspects of their medical career.

1.A Health Care: In this section of the survey, we are seeking your views on the state of the health care system **in your community** and your preferences regarding Canada's health policy.

* The QUALITY of the health care system in your community is:

Excellent	Good	Adequate	Poor	Very Poor	Unable to Judge
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The EFFICIENCY of the health care system in your community is:

Very high	High	Moderate	Low	Very Low	Unable to Judge
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* Please indicate your assessment of ACCESS to specific services in your community using the following scales (please circle the appropriate response):

Community-based services:
(Excellent Good Adequate Poor Very Poor No Opinion)

Hospital services:
(Excellent Good Adequate Poor Very Poor No Opinion)

Long-term care services:
(Excellent Good Adequate Poor Very Poor No Opinion)

* COOPERATION among the different health care professions in your community is:

Very high	High	Moderate	Low	Very Low	Unable to Judge
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* PARTICIPATION by physicians in HEALTH POLICY AND PLANNING in your community is:

Very high	High	Moderate	Low	Very Low	Unable to Judge
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* Using the following grading scale **please** indicate your assessment of the quality of specific services in your community (100 = the best, 0 = the worst):

Community-based services	(100	90	80	70	60	50	40	30	20	10	0	No opinion)
Hospital services	(100	90	80	70	60	50	40	30	20	10	0	No opinion)
Long term care services	(100	90	80	70	60	50	40	30	20	10	0	No opinion)

1B. The Regionalisation of Health Services

* The regionalisation of health services has resulted in greater responsiveness to local community needs.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No Opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The regionalisation of health services has reduced costs.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No Opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The regionalisation of health services has improved the services available to your patients.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No Opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The members of your local health board are:

All elected by the community	Mostly elected with some appointed by the Ministry of Health	Approximately half are elected and half are appointed	Mostly appointed with some elected by the community.	All appointed by the Ministry of Health
[ ]	[ ]	[ ]	[ ]	[ ]

* Physicians are sufficiently represented on your local health board.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No Opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The members of your health board seem knowledgeable about local health service issues.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No Opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* In your opinion, the members of your local health board are able to work together to meet common objectives.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No Opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

*Your local health board is effective in governing the health region.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No Opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

2. EQUITY: In this section, we are seeking to measure equity. Equity is defined as the fairness of the exchange between efforts and costs (inputs) and the value of the rewards (outputs) received. Please indicate your opinion in each of the following statements.

* The level of RESPECT for physicians by

Patients is:	(Very High	High	Moderate	Low	Very Low	No Opinion)
Nurses is:	(Very High	High	Moderate	Low	Very Low	No Opinion)
Administrators is:	(Very High	High	Moderate	Low	Very Low	No Opinion)

* How often do you feel that you give a great deal of ATTENTION TO YOUR PATIENTS, but get little appreciation in return.

Very Often	Often	Occasionally	Rarely	Very Rarely	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The amount of INTERESTING WORK in your daily activities is:

Very High	High	Moderate	Low	Very Low	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The amount of TRIVIAL WORK in your daily activities is:

Very High	High	Moderate	Low	Very Low	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* Do you FACE BARRIERS in developing your clinical skills?

Very Often	Often	Occasionally	Rarely	Very Rarely	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* Presently your SENSE OF ACCOMPLISHMENT in daily activities is:

Very High	High	Moderate	Low	Very Low	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The quality of your work is RECOGNIZED BY YOUR PEERS:

Very Often	Often	Occasionally	Rarely	Very Rarely	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* How often do you feel that you WORK TOO HARD for the rewards received?

Very Often	Often	Occasionally	Rarely	Very Rarely	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* How often do you feel that making the EXTRA EFFORT is worth the rewards received?

Very Often	Often	Occasionally	Rarely	Very Rarely	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The proportion of your patients with COMPLICATED CLINICAL CONDITIONS is:

Very High	High	Moderate	Low	Very Low	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The proportion of your patients with LOW SOCIOECONOMIC STATUS is:

Very High	High	Moderate	Low	Very Low	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The proportion of your patients experiencing difficulty in COPING WITH PERSONAL /FAMILY PROBLEMS is:

Very High	High	Moderate	Low	Very Low	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* How often do you feel that you give a great deal of attention to ADMINISTRATIVE DUTIES associated with your practice group, but get little appreciation in return?

Very Often	Often	Occasionally	Rarely	Very Rarely	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* Your level of financial compensation fairly reflects the RESPONSIBILITIES you have.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No Opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* Your level of financial compensation fairly reflects the EXPERIENCE you have.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No Opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* Your level of financial compensation fairly reflects the STRESSES of your work.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No Opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* The process used in your province to determine rates of reimbursement fairly represents ALL AREAS OF SPECIALIZATION in the deliberations.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No Opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* How often do you play an IMPORTANT ROLE in the health of your patients?

Very Often	Often	Occasionally	Rarely	Very Rarely	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* How often do you make an IMPORTANT CONTRIBUTION to your medical community?

Very Often	Often	Occasionally	Rarely	Very Rarely	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

In general, the rewards (tangible and intangible) for the work that you do are:

Excellent	Very Good	Good	Adequate	Poor	Very Poor	Terrible
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

3. Regular Working Hours (excluding On Call)

Please indicate whether you would like to spend more or less time devoted to specific activities. You may wish to spend time on activities that you are not currently doing (eg. teaching or research); this can be indicated by using the ratings of *more* or *much more*.

Patient Care	*Much More*	*More*	*No Change*	*Less*	*Do Much Less*
Assessment & Treatment by you alone	☐	☐	☐	☐	☐
Assessment & Treatment by you as part of a team	☐	☐	☐	☐	☐
Communicating Care Plan to other health personnel	☐	☐	☐	☐	☐
Counselling patients on risk factors & healthy habits	☐	☐	☐	☐	☐
Research & Teaching	*Much More*	*More*	*Same*	*Less*	*Much Less*
Research: Clinical trials, presenting papers, etc.	☐	☐	☐	☐	☐
Teaching: lecturing & demonstrating techniques.	☐	☐	☐	☐	☐
Maintaining Knowledge	*Much More*	*More*	*Same*	*Less*	*Much Less*
Reading medical journals, CME activities, etc.	☐	☐	☐	☐	☐
Clinical Rounds, Case Conferences, etc.	☐	☐	☐	☐	☐
Management Functions	*Much More*	*More*	*Same*	*Less*	*Much Less*
Completing paperwork associated with your practice	☐	☐	☐	☐	☐
Attending committee meetings, writing reports, etc.	☐	☐	☐	☐	☐

Please indicate the approximate percentage of time you now spend on these activities:

Patient Care	%
Research and Teaching	%
Maintaining Knowledge	%
Management Functions	%
Total	**100 %**

Approximately how many hours do you work per week (excluding on call)? ☐

4. On-Call

How many WEEKDAY evenings are you On-Call in an average month?	*None*	1-4 per month	5-8 per month	9-12 per month	13-16 per month	17 + per month
	☐	☐	☐	☐	☐	☐

How many WEEKENDS in an average month are you On-Call? (1,2,3 or 4)	Is FRIDAY night part of the weekend On-Call coverage?	Do you cover the entire weekend alone?
☐	Yes ☐ No ☐	Yes ☐ No ☐

5. Managing Health and Stress

Do you:	Very Often	Often	Sometimes	Rarely	Never
get regular exercise (at least 3 times per week)					
eat well balanced meals (including breakfast)					
get a full night's sleep					
smoke cigarettes/cigars/ or pipe					
consume alcoholic beverages					
get tasks done without feeling rushed					
experience conflict between work commitments & personal responsibilities					
take time to pursue a special interest or hobby					
have time to keep up with developments in your clinical specialty					
experience frustration in gaining access to services/facilities for your patients					
feel fatigued during the day					
experience frustration in dealing with demanding patients					
regularly interact with colleagues (other than consults) to discuss professional issues					

	Very High	High	Moderate	Low	Very Low
* How would you rate your level of Stress?	☐	☐	☐	☐	☐

	Very Good	Good	Fair	Poor	Very Poor
* How would you rate your level of Health?	☐	☐	☐	☐	☐

6. Satisfaction with Medicine as a Career: In the following questions we would like you to indicate your satisfaction with various aspects of your professional career.

How satisfied are you with:

* the **predictability** of your work schedule?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* the **congeniality** of your practice setting?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* the **availability of resources** needed to treat your patients?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* the amount of **time available** to spend with your patients?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* the level of **awareness** you have about the lives of your patients?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* the degree of **trust** between you and your patients?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* your **income** as a physician?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* time available to be with your **family and friends**?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

How satisfied are you with:

* the **autonomy** you have over how you do your job?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* your **status** within the medical community?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* the **variety** in the work that you do?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* your opportunities to pursue **professional interests**?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* your **development** as a professional?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* being able to minimize **interruptions** to your time at home?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* the type of **committee work** that you do?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

In general, how satisfied are you with your medical career?

Very satisfied	Satisfied	Somewhat satisfied	Somewhat dissatisfied	Dissatisfied	Very Dissatisfied	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

7. Your Practice

a) Organizational Arrangements

[ ] Solo/Individual Practice
[ ] Share space and reception staff expenses
[ ] Share space, reception and clinical staff expenses
[ ] Share revenues, space, reception and clinical staff expenses
[ ] Other:_____

Do you agree that your current organizational arrangement is the most appropriate for your practice group?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
[ ]	[ ]	[ ]	[ ]	[ ]

How easy or difficult would it be for you to make changes to the organizational arrangements within your practice group?

Very Easy	Easy	Somewhat Easy	Somewhat Difficult	Difficult	Very Difficult
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

b) What percentage of your reimbursement comes from the following methods?

____%	Fee-for-service
____%	Salary
____%	Capitated rate per patient
____%	Sessional
____%	Other: _____

100 %

Do you agree that your current reimbursement method is the most appropriate for what you do?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
[ ]	[ ]	[ ]	[ ]	[ ]

How easy or difficult would it be for you to make changes to your current reimbursement arrangements?

Very Easy	Easy	Somewhat Easy	Somewhat Difficult	Difficult	Very Difficult
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

c) How many physicians (including yourself) are in your practice group? _____

How often do you routinely meet as a practice group to discuss patient care issues?

[ ] Daily	[ ] Bi-weekly	[ ] Every 6 months	[ ] Never
[ ] Weekly	[ ] Monthly	[ ] Annually	

How often do nurses participate in these meetings?

Always	Most of the time	Sometimes	Rarely	Never
[ ]	[ ]	[ ]	[ ]	[ ]

d) Within your practice setting (office/clinic) the nurse's role includes (check all that apply):

[ ] receptionist/secretarial/clerical duties
[ ] preparing the patient for examination by the physician
[ ] conducting preliminary examinations
[ ] performing delegated clinical duties with substantial physician supervision
[ ] performing delegated clinical duties with limited physician supervision
[ ] other duties _____.

Would you like the clinical role of nurses in your practice setting to be enlarged or reduced?

Greatly Enlarged	Enlarged	Remain the same	Reduced	Greatly Reduced
[ ]	[ ]	[ ]	[ ]	[ ]

e) In the LAST MONTH how often did you refer a patient to an allied health professional such as a physical therapist or dietitian.

Daily	Every few days	Weekly	Every other week	Once	Not at all
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

f) In the LAST MONTH how often did you refer a patient to a counselor such as a psychologist or social worker.

Daily	Every few days	Weekly	Every other week	Once	Not at all
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

g) In general, what is your approach when making complex clinical decisions:

[ ] To gather all of the relevant facts myself and make the clinical decision myself
[ ] To obtain consults from others and make the clinical decision myself
[ ] To discuss the clinical case with others and then make the clinical decision myself
[ ] To have all relevant people confer and the clinical decision is then made by the group

Would you agree that your approach to complex decisions is similar to the other members of your practice group?

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Not Applicable
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

h) The patient care philosophy of your practice is:

[ ] *determined by me alone, since I am in solo/individual practice.*
[ ] at the discretion of each physician within the practice group.
[ ] determined by each physician after discussions with the practice group.
[ ] determined by group consensus.
[ ] determined by the senior physicians after discussions with the practice group.
[ ] determined by the senior physicians.
[ ] other _____

i) Your efforts to develop clinical skills are supported by the other members of your group.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Not Applicable
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

8. Demographics

a. Main area of specialization	b. Additional areas of practice

c. How old are you? _____ years	d. Gender [ ] Female [ ] Male

e. How many years have you been practising? _____ years

f. Did you work prior to entering medical school (excluding summer jobs)?
[ ] Yes [ ] No

g. **If YES to (f),** What position: _____ How many years?_____
What position: _____ How many years?_____

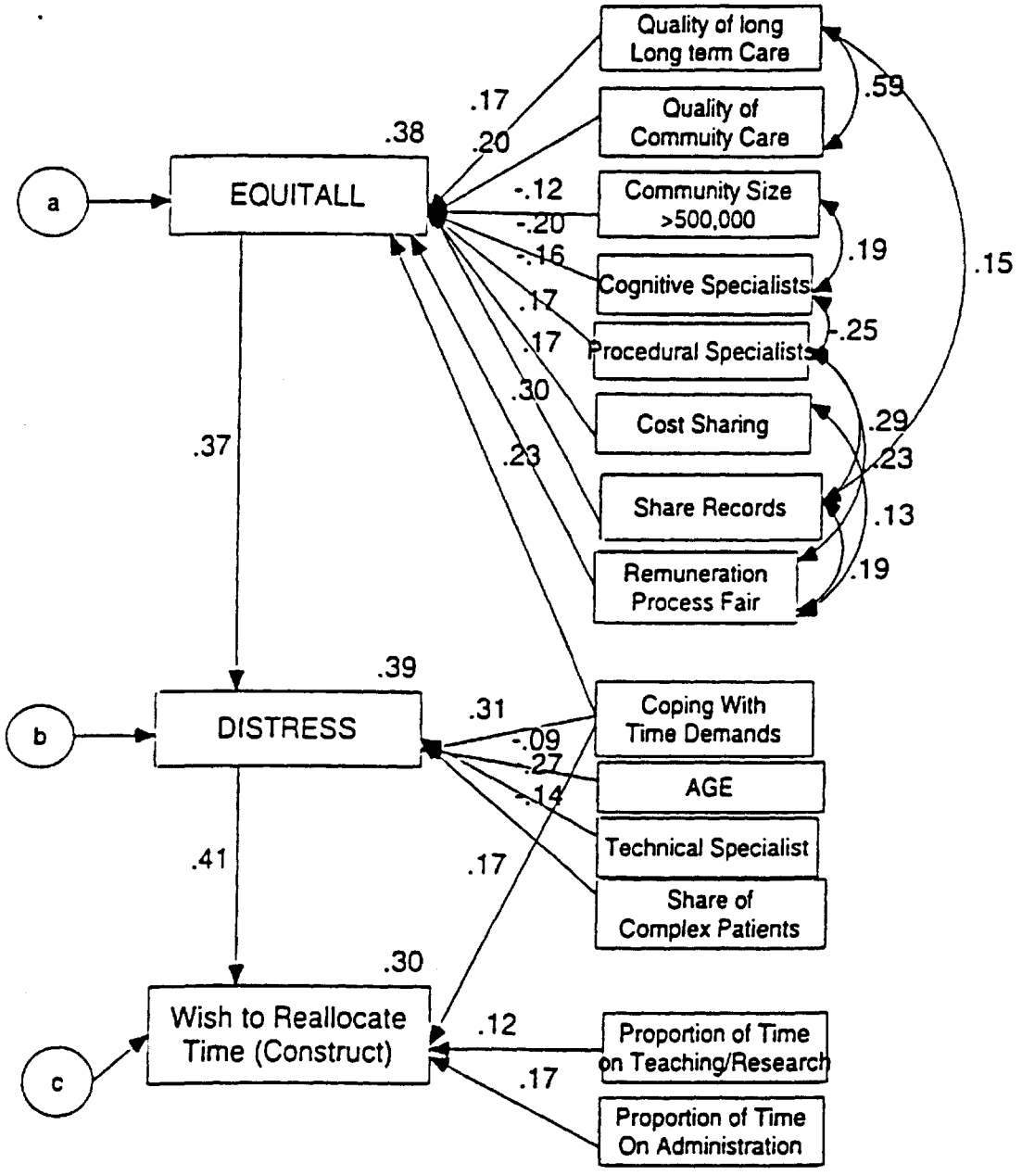
h. Marital Status:	i. Dependents:
[ ] Single [ ] Married/Common Law [ ] Separated [ ] Divorced [ ] Widowed [ ] Other _____	Ages of Children still living at home ____ , ____ , ____ , ____ , ____, ____ Ages of dependent adults living with you ____ , ____ , ____ , ____ , ____

9. What issues should be covered in follow-up surveys?

Thank-you for your cooperation in this study. The results will be analysed and reported in broad groups to protect the identity of individual physicians. Your identity will be held in strictest confidence.

APPENDIX 3:

SEM Analysis - *Multi-linear Pathways*


a
EQUITALL
.38
.17
.20
-.12
-.20
-.16
.17
.17
.30
.23
.37
Quality of long Long term Care
Quality of Commuity Care
Community Size >500,000
Cognitive Specialists
Procedural Specialists
Cost Sharing
Share Records
Remuneration Process Fair
.59
.19
.15
-.25
.29
.23
.13
.19
b
DISTRESS
.39
.31
-.09
.27
-.14
.41
.17
Coping With Time Demands
AGE
Technical Specialist
Share of Complex Patients
c
Wish to Reallocate Time (Construct)
.30
.12
.17
Proportion of Time on Teaching/Research
Proportion of Time On Administration

Fit Measures

Fit Measure	Default model	Saturated	Independence	Macro
Discrepancy	223.188	0.000	8663.071	CMIN
Degrees of freedom	110	0	153	DF
P	0.000		0.000	P
Number of parameters	60	170	17	NPAR
Discrepancy / df	2.029		56.621	CMINDF
RMR				RMR
GFI				GFI
Adjusted GFI				AGFI
Parsimony-adjusted GFI				PGFI
Normed fit index	0.974	1.000	0.000	NFI
Relative fit index	0.964		0.000	RFI
Incremental fit index	0.987	1.000	0.000	IFI
Tucker-Lewis index	0.982		0.000	TLI
Comparative fit index	0.987	1.000	0.000	CFI
Parsimony ratio	0.719	0.000	1.000	PRATIO
Parsimony-adjusted NFI	0.700	0.000	0.000	PNFI
Parsimony-adjusted CFI	0.709	0.000	0.000	PCFI
Noncentrality parameter estim	113.188	0.000	8510.071	NCP
NCP lower bound	74.361	0.000	8208.400	NCPLO
NCP upper bound	159.793	0.000	8818.055	NCPHI
FMIN	0.934	0.000	36.247	FMIN
F0	0.474	0.000	35.607	F0
F0 lower bound	0.311	0.000	34.345	F0LO
F0 upper bound	0.669	0.000	36.896	F0HI
RMSEA	0.066		0.482	RMSEA
RMSEA lower bound	0.053		0.474	RMSEALO
RMSEA upper bound	0.078		0.491	RMSEAHI
P for test of close fit	0.021		0.000	PCLOSE
Akaike information criterion (AI	343.188	340.000	8697.071	AIC
Browne-Cudeck criterion	352.962	367.692	8699.840	BCC
Bayes information criterion				BIC
Consistent AIC				CAIC
Expected cross validation inde	1.436	1.423	36.389	ECVI
ECVI lower bound	1.273	1.423	35.127	ECVILO
ECVI upper bound	1.631	1.423	37.678	ECVIHI
MECVI	1.477	1.538	36.401	MECVI
Hoelter .05 index	146		6	HFIVE
Hoelter .01 index	158		6	HONE

			Estimate	S.E.	C.R.	P	Label
EQUITALL	<--	SPZNDUM3	-2.158	0.765	-2.819	0.005	par-4
EQUITALL	<--	SPZNDUM2	-2.248	0.613	-3.665	0.000	par-5
EQUITALL	<--	ORGDUM2	1.579	0.498	3.172	0.002	par-6
EQUITALL	<--	QUALTCR2	0.788	0.305	2.584	0.010	par-7
EQUITALL	<--	QUALCOM2	1.133	0.356	3.186	0.001	par-8
EQUITALL	<--	COMMDUM4	-1.510	0.648	-2.331	0.020	par-9
EQUITALL	<--	SHARECDS	1.696	0.588	2.887	0.004	par-10
EQUITALL	<--	PROCESS	1.776	0.326	5.456	0.000	par-11
EQUITALL	<--	COPING	0.452	0.100	4.510	0.000	par-12
DISTRESS	<--	CMPLPT2	-0.894	0.323	-2.765	0.006	par-1
DISTRESS	<--	SPZNDUM4	-2.285	0.426	-5.362	0.000	par-2
DISTRESS	<--	AGE	-0.033	0.018	-1.819	0.069	par-3
DISTRESS	<--	COPING	0.401	0.068	5.892	0.000	par-14
DISTRESS	<--	EQUITALL	0.251	0.035	7.151	0.000	par-16
Timpref8	<--	COPING	0.229	0.079	2.912	0.004	par-13
Timpref8	<--	DISTRESS	0.423	0.061	6.987	0.000	par-15
Timpref8	<--	MANTRINO	0.844	0.268	3.148	0.002	par-17
Timpref8	<--	RANDT3	0.525	0.234	2.247	0.025	par-18

Standardized Regression Weights

			Estimate
EQUITALL	<--	SPZNDUM3	-0.161
EQUITALL	<--	SPZNDUM2	-0.200
EQUITALL	<--	ORGDUM2	0.166
EQUITALL	<--	QUALTCR2	0.168
EQUITALL	<--	QUALCOM2	0.204
EQUITALL	<--	COMMDUM4	-0.124
EQUITALL	<--	SHARECDS	0.168
EQUITALL	<--	PROCESS	0.295
EQUITALL	<--	COPING	0.233
DISTRESS	<--	CMPLPT2	-0.141
DISTRESS	<--	SPZNDUM4	-0.272
DISTRESS	<--	AGE	-0.092
DISTRESS	<--	COPING	0.308
DISTRESS	<--	EQUITALL	0.375
Timpref8	<--	COPING	0.172
Timpref8	<--	DISTRESS	0.413
Timpref8	<--	MANTRINO	0.171
Timpref8	<--	RANDT3	0.122

Means

	Estimate	S.E.	C.R.	P	Label
QUALCOM2	2.597	0.055	46.894	0.000	par-30
COMMDUM4	0.182	0.025	7.221	0.000	par-31
SPZNDUM2	0.230	0.027	8.463	0.000	par-32
SPZNDUM3	0.142	0.023	6.202	0.000	par-33
ORGDUM2	0.434	0.032	13.457	0.000	par-34

SHARECDS	1.326	0.032	41.996	0.000	par-35
COPING	11.746	0.158	74.379	0.000	par-36
QUALTCR2	2.928	0.065	44.772	0.000	par-42
PROCESS	2.041	0.051	39.805	0.000	par-43
AGE	46.088	0.567	81.324	0.000	par-37
SPZNDUM4	0.172	0.024	7.020	0.000	par-38
CMPLPT2	1.535	0.033	47.169	0.000	par-39
RANDT3	2.037	0.049	41.696	0.000	par-40
MANTRINO	2.104	0.043	49.398	0.000	par-41

Intercepts

	Estimate	S.E.	C.R.	P	Label
EQUITALL	9.306	1.701	5.472	0.000	par-27
DISTRESS	10.128	1.446	7.003	0.000	par-28
Timpref8	3.362	1.344	2.501	0.012	par-29

Covariances

	Estimate	S.E.	C.R.	P	Label
QUALTCR2 <--> SHARECDS	0.069	0.025	2.771	0.006	par-19
QUALTCR2 <--> QUALCOM2	0.504	0.064	7.855	0.000	par-20
SPZNDUM2 <--> COMMDUM4	0.031	0.010	2.974	0.003	par-21
SPZNDUM3 <--> SPZNDUM2	-0.037	0.009	-3.981	0.000	par-22
SPZNDUM3 <--> SHARECDS	0.048	0.011	4.308	0.000	par-23
SHARECDS <--> PROCESS	0.069	0.025	2.771	0.006	par-24
SPZNDUM3 <--> PROCESS	0.063	0.018	3.534	0.000	par-25
ORGDUM2 <--> PROCESS	0.052	0.025	2.076	0.038	par-26

Correlations

	Estimate
QUALTCR2 <--> SHARECDS	0.147
QUALTCR2 <--> QUALCOM2	0.587
SPZNDUM2 <--> COMMDUM4	0.191
SPZNDUM3 <--> SPZNDUM2	-0.247
SPZNDUM3 <--> SHARECDS	0.290
SHARECDS <--> PROCESS	0.187
SPZNDUM3 <--> PROCESS	0.228
ORGDUM2 <--> PROCESS	0.133

Variances

	Estimate	S.E.	C.R.	P	Label
SPZNDUM3	0.124	0.011	10.987	0.000	par-44
SPZNDUM2	0.176	0.016	10.936	0.000	par-45
ORGDUM2	0.246	0.023	10.863	0.000	par-46
QUALTCR2	1.015	0.093	10.970	0.000	par-47
QUALCOM2	0.728	0.067	10.887	0.000	par-48
COMMDUM4	0.149	0.014	10.818	0.000	par-49
SHARECDS	0.218	0.021	10.418	0.000	par-50
PROCESS	0.617	0.057	10.832	0.000	par-51
COPING	5.920	0.544	10.888	0.000	par-52
a	13.735	1.280	10.731	0.000	par-53
CMPLPT2	0.249	0.023	10.840	0.000	par-54

SPZNDUM4	0.142	0.013	10.909	0.000	par-55
AGE	76.439	7.007	10.909	0.000	par-56
b	6.082	0.561	10.833	0.000	par-57
MANTRINO	0.430	0.040	10.886	0.000	par-58
RANDT3	0.566	0.052	10.886	0.000	par-59
c	7.328	0.672	10.905	0.000	par-60

Squared Multiple Correlations

	Estimate
EQUITALL	0.385
DISTRESS	0.392
Timpref8	0.301

APPENDIX 4:

SEM Analysis - *Main Pathway* Model

Fit Measures

Fit Measure	Default model	Saturated	Independence	Macro
Discrepancy	24.585	0.000	5824.000	CMIN
Degrees of freedom	19	0	36	DF
P	0.175		0.000	P
Number of parameters	25	44	8	NPAR
Discrepancy / df	1.294		161.778	CMINDF
RMR				RMR
GFI				GFI
Adjusted GFI				AGFI
Parsimony-adjusted GFI				PGFI
Normed fit index	0.996	1.000	0.000	NFI
Relative fit index	0.992		0.000	RFI
Incremental fit index	0.999	1.000	0.000	IFI
Tucker-Lewis index	0.998		0.000	TLI
Comparative fit index	0.999	1.000	0.000	CFI
Parsimony ratio	0.528	0.000	1.000	PRATIO
Parsimony-adjusted NFI	0.526	0.000	0.000	PNFI
Parsimony-adjusted CFI	0.527	0.000	0.000	PCFI
Noncentrality parameter estimc	5.585	0.000	5788.000	NCP
NCP lower bound	0.000	0.000	5540.489	NCPLO
NCP upper bound	22.544	0.000	6041.799	NCPHI
FMIN	0.103	0.000	24.368	FMIN
F0	0.023	0.000	24.218	F0
F0 lower bound	0.000	0.000	23.182	F0LO
F0 upper bound	0.094	0.000	25.279	F0HI
RMSEA	0.035		0.820	RMSEA
RMSEA lower bound	0.000		0.802	RMSEALO
RMSEA upper bound	0.070		0.838	RMSEAHI
P for test of close fit	0.718		0.000	PCLOSE
Akaike information criterion (AI(	74.585	88.000	5840.000	AIC
Browne-Cudeck criterion	76.541	91.443	5840.626	BCC
Bayes information criterion				BIC
Consistent AIC				CAIC
Expected cross validation inde›	0.312	0.368	24.435	ECVI
ECVI lower bound	0.289	0.368	23.400	ECVILO
ECVI upper bound	0.383	0.368	25.497	ECVIHI
MECVI	0.320	0.383	24.438	MECVI
Hoelter .05 index	294		3	HFIVE
Hoelter .01 index	352		3	HONE

Regression Weights

		Estimate	S.E.	C.R.	P	Label
DISTRESS	<-- Distributive_Equity	0.926	0.145	6.392	0.000	par-6
Wish to_Reallocate_Time	<-- DISTRESS	0.134	0.024	5.651	0.000	par-7
EXTRTANG	<-- Distributive_Equity	1.000				
INTRINSC	<-- Distributive_Equity	0.719	0.111	6.454	0.000	par-1
EXINTANG	<-- Distributive_Equity	0.491	0.086	5.699	0.000	par-2
TIME4	<-- Wish to_Reallocate_Time	1.138	0.242	4.691	0.000	par-3
TIME3	<-- Wish to_Reallocate_Time	0.828	0.198	4.181	0.000	par-4
TIME2	<-- Wish to_Reallocate_Time	1.000				
TIME1	<-- Wish to_Reallocate_Time	0.932	0.236	3.947	0.000	par-5

Standardized Regression Weights

		Estimate
DISTRESS	<-- Distributive_Equity	0.613
Wish to_Reallocate_Time	<-- DISTRESS	0.706
EXTRTANG	<-- Distributive_Equity	0.663
INTRINSC	<-- Distributive_Equity	0.631
EXINTANG	<-- Distributive_Equity	0.504
TIME4	<-- Wish to_Reallocate_Time	0.524
TIME3	<-- Wish to_Reallocate_Time	0.421
TIME2	<-- Wish to_Reallocate_Time	0.463
TIME1	<-- Wish to_Reallocate_Time	0.384

Intercepts

	Estimate	S.E.	C.R.	P	Label
DISTRESS	17.925	0.201	89.271	0.000	par-13
TIME2	2.090	0.431	4.844	0.000	par-8
TIME1	2.182	0.481	4.538	0.000	par-9
EXTRTANG	13.750	0.200	68.592	0.000	par-10
INTRINSC	11.492	0.151	75.869	0.000	par-11
EXINTANG	12.279	0.130	94.802	0.000	par-12
TIME3	1.727	0.391	4.412	0.000	par-14
TIME4	1.127	0.434	2.598	0.009	par-15

Variances

	Estimate	S.E.	C.R.	P	Label
Distributive_Equity	4.222	0.926	4.557	0.000	par-16
d	6.012	0.750	8.013	0.000	par-17
5w	0.174	0.069	2.513	0.012	par-18
1w	1.734	0.174	9.960	0.000	par-19
1e	5.382	0.756	7.121	0.000	par-20
2e	3.302	0.428	7.722	0.000	par-21
3e	2.990	0.321	9.322	0.000	par-22
3w	1.101	0.113	9.709	0.000	par-23
2w	1.270	0.136	9.362	0.000	par-24
4w	1.185	0.136	8.685	0.000	par-25

Squared Multiple Correlations

	Estimate

DISTRESS	0.376
Wish to_Reallocate_Time	0.498
TIME4	0.274
TIME2	0.214
TIME3	0.177
EXINTANG	0.254
INTRINSC	0.398
EXTRTANG	0.440
TIME1	0.148

APPENDIX 5:

SEM Analysis - *Stage ONE* Model

Fit Measures

Fit Measure	Default model	Saturated	Independence	Macro
Discrepancy	25.481	0.000	5724.445	CMIN
Degrees of freedom	16	0	36	DF
P	0.062		0.000	P
Number of parameters	28	44	8	NPAR
Discrepancy / df	1.593		159.012	CMINDF
RMR				RMR
GFI				GFI
Adjusted GFI				AGFI
Parsimony-adjusted GFI				PGFI
Normed fit index	0.996	1.000	0.000	NFI
Relative fit index	0.990		0.000	RFI
Incremental fit index	0.998	1.000	0.000	IFI
Tucker-Lewis index	0.996		0.000	TLI
Comparative fit index	0.998	1.000	0.000	CFI
Parsimony ratio	0.444	0.000	1.000	PRATIO
Parsimony-adjusted NFI	0.442	0.000	0.000	PNFI
Parsimony-adjusted CFI	0.444	0.000	0.000	PCFI
Noncentrality parameter estimc	9.481	0.000	5688.445	NCP
NCP lower bound	0.000	0.000	5443.093	NCPLO
NCP upper bound	27.332	0.000	5940.086	NCPHI
FMIN	0.107	0.000	23.952	FMIN
F0	0.040	0.000	23.801	F0
F0 lower bound	0.000	0.000	22.774	F0LO
F0 upper bound	0.114	0.000	24.854	F0HI
RMSEA	0.050		0.813	RMSEA
RMSEA lower bound	0.000		0.795	RMSEALO
RMSEA upper bound	0.085		0.831	RMSEAHI
P for test of close fit	0.463		0.000	PCLOSE
Akaike information criterion (AI(	81.481	88.000	5740.445	AIC
Browne-Cudeck criterion	83.673	91.443	5741.071	BCC
Bayes information criterion				BIC
Consistent AIC				CAIC
Expected cross validation inde>	0.341	0.368	24.019	ECVI
ECVI lower bound	0.301	0.368	22.992	ECVILO
ECVI upper bound	0.416	0.368	25.071	ECVIHI
MECVI	0.350	0.383	24.021	MECVI
Hoelter .05 index	247		3	HFIVE
Hoelter .01 index	301		3	HONE

par-18

			Estimate	S.E.	C.R.	P	Label
Distributive_Equity	<--	process	0.368	0.102	3.619	0.000	par-8
Distributive_Equity	<--	Local Health_System	1.440	0.409	3.520	0.000	par-9
Distributive_Equity	<--	COPING	0.112	0.032	3.517	0.000	par-10
QUALCOM2	<--	Local Health_System	1.217	0.292	4.175	0.000	par-1
HCSEFF2	<--	Local Health_System	1.000				
HBSACCS2	<--	Local Health_System	1.043	0.270	3.862	0.000	par-2
INTRINSC	<--	Distributive_Equity	1.501	0.284	5.284	0.000	par-3
EXTRTANG	<--	Distributive_Equity	2.566	0.460	5.583	0.000	par-5
EXINTANG	<--	Distributive_Equity	1.000				

Standardized Regression Weights

			Estimate
Distributive_Equity	<--	process	0.314
Distributive_Equity	<--	Local Health_System	0.594
Distributive_Equity	<--	COPING	0.298
QUALCOM2	<--	Local Health_System	0.535
HCSEFF2	<--	Local Health_System	0.510
HBSACCS2	<--	Local Health_System	0.434
INTRINSC	<--	Distributive_Equity	0.583
EXTRTANG	<--	Distributive_Equity	0.753
EXINTANG	<--	Distributive_Equity	0.454

Means

	Estimate	S.E.	C.R.	P	Label
COPING	11.758	0.157	75.050	0.000	par-17
process	2.046	0.050	40.761	0.000	par-18

Intercepts

	Estimate	S.E.	C.R.	P	Label
HCSEFF2	3.133	0.048	65.885	0.000	par-11
HBSACCS2	3.157	0.059	53.713	0.000	par-12
QUALCOM2	2.595	0.055	46.861	0.000	par-13
EXINTANG	10.212	0.490	20.858	0.000	par-14
INTRINSC	8.388	0.651	12.891	0.000	par-15
EXTRTANG	8.446	0.979	8.624	0.000	par-16

Covariances

			Estimate	S.E.	C.R.	P	Label
process	<-->	COPING	0.061	0.122	0.502	0.616	par-4
process	<-->	Local Health_System	0.031	0.027	1.139	0.255	par-6
COPING	<-->	Local Health_System	0.034	0.084	0.408	0.684	par-7

Correlations

			Estimate
process	<-->	COPING	0.032
process	<-->	Local Health_System	0.106
COPING	<-->	Local Health_System	0.038

Variances

	Estimate	S.E.	C.R.	P	Label
Local Health_System	0.141	0.048	2.960	0.003	par-19
process	0.602	0.055	10.932	0.000	par-20
COPING	5.867	0.537	10.932	0.000	par-21
4e	0.332	0.136	2.433	0.015	par-22
ih	0.400	0.050	8.017	0.000	par-23
3h	0.519	0.069	7.581	0.000	par-24
2h	0.660	0.074	8.981	0.000	par-25
2e	3.620	0.413	8.756	0.000	par-26
3e	3.183	0.322	9.882	0.000	par-27
1e	4.160	0.762	5.457	0.000	par-28

Squared Multiple Correlations

	Estimate
Distributive_Equity	0.599
EXINTANG	0.206
EXTRTANG	0.567
INTRINSC	0.340
HBSACCS2	0.188
HCSEFF2	0.260
QUALCOM2	0.286

APPENDIX 6:

SEM Analysis - *Stage TWO* Model

Fit Measures

Fit Measure	Default model	Saturated	Independence	Macro
Discrepancy	30.234	0.000	6661.299	CMIN
Degrees of freedom	22	0	45	DF
P	0.113		0.000	P
Number of parameters	32	54	9	NPAR
Discrepancy / df	1.374		148.029	CMINDF
RMR				RMR
GFI				GFI
Adjusted GFI				AGFI
Parsimony-adjusted GFI				PGFI
Normed fit index	0.995	1.000	0.000	NFI
Relative fit index	0.991		0.000	RFI
Incremental fit index	0.999	1.000	0.000	IFI
Tucker-Lewis index	0.997		0.000	TLI
Comparative fit index	0.999	1.000	0.000	CFI
Parsimony ratio	0.489	0.000	1.000	PRATIO
Parsimony-adjusted NFI	0.487	0.000	0.000	PNFI
Parsimony-adjusted CFI	0.488	0.000	0.000	PCFI
Noncentrality parameter estimc	8.234	0.000	6616.299	NCP
NCP lower bound	0.000	0.000	6351.413	NCPLO
NCP upper bound	26.804	0.000	6887.475	NCPHI
FMIN	0.127	0.000	27.872	FMIN
F0	0.034	0.000	27.683	F0
F0 lower bound	0.000	0.000	26.575	F0LO
F0 upper bound	0.112	0.000	28.818	F0HI
RMSEA	0.040		0.784	RMSEA
RMSEA lower bound	0.000		0.768	RMSEALO
RMSEA upper bound	0.071		0.800	RMSEAHI
P for test of close fit	0.668		0.000	PCLOSE
Akaike information criterion (AI(	94.234	108.000	6679.299	AIC
Browne-Cudeck criterion	97.028	112.716	6680.085	BCC
Bayes information criterion				BIC
Consistent AIC				CAIC
Expected cross validation inde›	0.394	0.452	27.947	ECVI
ECVI lower bound	0.360	0.452	26.839	ECVILO
ECVI upper bound	0.472	0.452	29.081	ECVIHI
MECVI	0.406	0.472	27.950	MECVI
Hoelter .05 index	269		3	HFIVE
Hoelter .01 index	319		3	HONE

			Estimate	S.E.	C.R.	P	Label
Distributive_Equity	<--	Local Health_System	1.459	0.403	3.616	0.000	par-4
Distributive_Equity	<--	COPING	0.123	0.033	3.712	0.000	par-9
Distributive_Equity	<--	process	0.375	0.102	3.689	0.000	par-12
QUALCOM2	<--	Local Health_System	1.164	0.280	4.151	0.000	par-1
EXINTANG	<--	Distributive_Equity	1.000				
INTRINSC	<--	Distributive_Equity	1.472	0.257	5.725	0.000	par-2
EXTRTANG	<--	Distributive_Equity	2.337	0.384	6.093	0.000	par-3
HCSEFF2	<--	Local Health_System	1.000				
HBSACCS2	<--	Local Health_System	1.070	0.272	3.939	0.000	par-5
Distress	<--	Distributive_Equity	1.629	0.317	5.141	0.000	par-6
Distress	<--	COPING	0.276	0.079	3.497	0.000	par-8

Standardized Regression Weights

			Estimate
Distributive_Equity	<--	Local Health_System	0.576
Distributive_Equity	<--	COPING	0.310
Distributive_Equity	<--	process	0.302
QUALCOM2	<--	Local Health_System	0.518
EXINTANG	<--	Distributive_Equity	0.481
INTRINSC	<--	Distributive_Equity	0.605
EXTRTANG	<--	Distributive_Equity	0.726
HCSEFF2	<--	Local Health_System	0.517
HBSACCS2	<--	Local Health_System	0.450
Distress	<--	Distributive_Equity	0.505
Distress	<--	COPING	0.216

Means

	Estimate	S.E.	C.R.	P	Label
COPING	11.758	0.157	75.050	0.000	par-19
process	2.046	0.050	40.761	0.000	par-20

Intercepts

	Estimate	S.E.	C.R.	P	Label
HCSEFF2	3.133	0.048	65.885	0.000	par-13
HBSACCS2	3.157	0.059	53.709	0.000	par-14
QUALCOM2	2.595	0.055	46.860	0.000	par-15
EXINTANG	10.063	0.497	20.256	0.000	par-16
INTRINSC	8.229	0.653	12.598	0.000	par-17
EXTRTANG	8.570	0.955	8.971	0.000	par-18
Distress	11.063	0.953	11.608	0.000	par-21

Covariances

			Estimate	S.E.	C.R.	P	Label
COPING	<-->	Local Health_System	0.032	0.085	0.383	0.702	par-7
COPING	<-->	process	0.061	0.122	0.502	0.616	par-10
process	<-->	Local Health_System	0.031	0.028	1.129	0.259	par-11

Correlations

	Estimate
COPING <--> Local Health_System	0.035
COPING <--> process	0.032
process <--> Local Health_System	0.105

Variances

	Estimate	S.E.	C.R.	P	Label
Local Health_System	0.144	0.048	2.988	0.003	par-22
COPING	5.867	0.537	10.932	0.000	par-23
process	0.602	0.055	10.932	0.000	par-24
4e	0.394	0.146	2.696	0.007	par-25
2h	0.648	0.074	8.784	0.000	par-26
3e	3.083	0.313	9.845	0.000	par-27
2e	3.477	0.395	8.797	0.000	par-28
ih	0.396	0.050	7.904	0.000	par-29
3h	0.532	0.068	7.860	0.000	par-30
1e	4.544	0.669	6.788	0.000	par-31
1d	6.014	0.642	9.371	0.000	par-32

Squared Multiple Correlations

	Estimate
Distributive_Equity	0.574
Distress	0.376
HCSEFF2	0.267
EXTRTANG	0.527
INTRINSC	0.366
EXINTANG	0.231
QUALCOM2	0.269
HBSACCS2	0.203

APPENDIX 7:

SEM Analysis - *Stage THREE* Model (Initial)

Fit Measures

Fit Measure	Default model	Saturated	Independence	Macro
Discrepancy	88.696	0.000	9770.751	CMIN
Degrees of freedom	67	0	105	DF
P	0.039		0.000	P
Number of parameters	52	119	14	NPAR
Discrepancy / df	1.324		93.055	CMINDF
RMR				RMR
GFI				GFI
Adjusted GFI				AGFI
Parsimony-adjusted GFI				PGFI
Normed fit index	0.991	1.000	0.000	NFI
Relative fit index	0.986		0.000	RFI
Incremental fit index	0.998	1.000	0.000	IFI
Tucker-Lewis index	0.996		0.000	TLI
Comparative fit index	0.998	1.000	0.000	CFI
Parsimony ratio	0.638	0.000	1.000	PRATIO
Parsimony-adjusted NFI	0.632	0.000	0.000	PNFI
Parsimony-adjusted CFI	0.637	0.000	0.000	PCFI
Noncentrality parameter estimc	21.696	0.000	9665.751	NCP
NCP lower bound	1.224	0.000	9344.606	NCPLO
NCP upper bound	50.253	0.000	9993.195	NCPHI
FMIN	0.371	0.000	40.882	FMIN
F0	0.091	0.000	40.442	F0
F0 lower bound	0.005	0.000	39.099	F0LO
F0 upper bound	0.210	0.000	41.813	F0HI
RMSEA	0.037		0.621	RMSEA
RMSEA lower bound	0.009		0.610	RMSEALO
RMSEA upper bound	0.056		0.631	RMSEAHI
P for test of close fit	0.860		0.000	PCLOSE
Akaike information criterion (AI(	192.696	238.000	9798.751	AIC
Browne-Cudeck criterion	199.660	253.938	9800.626	BCC
Bayes information criterion				BIC
Consistent AIC				CAIC
Expected cross validation inde>	0.806	0.996	40.999	ECVI
ECVI lower bound	0.721	0.996	39.655	ECVILO
ECVI upper bound	0.926	0.996	42.369	ECVIHI
MECVI	0.835	1.063	41.007	MECVI
Hoelter .05 index	235		4	HFIVE
Hoelter .01 index	261		4	HONE

Regression Weights

			Estimate	S.E.	C.R.	P	Label
Distributive_Equity	<--	Local Health_System	1.449	0.400	3.619	0.000	par-4
Distributive_Equity	<--	COPING	0.124	0.033	3.717	0.000	par-11
Distributive_Equity	<--	process	0.375	0.102	3.692	0.000	par-12
Distress	<--	Distributive_Equity	1.629	0.317	5.144	0.000	par-6
Distress	<--	COPING	0.276	0.079	3.493	0.000	par-10
Wish to_Reallocate_Time	<--	COPING	0.058	0.019	3.132	0.002	par-9
Wish to_Reallocate_Time	<--	mantrino	0.208	0.064	3.237	0.001	par-18
Wish to_Reallocate_Time	<--	Distress	0.094	0.019	5.078	0.000	par-21
QUALCOM2	<--	Local Health_System	1.147	0.277	4.147	0.000	par-1
EXINTANG	<--	Distributive_Equity	1.000				
INTRINSC	<--	Distributive_Equity	1.471	0.257	5.727	0.000	par-2
EXTRTANG	<--	Distributive_Equity	2.334	0.383	6.095	0.000	par-3
HCSEFF2	<--	Local Health_System	1.000				
HBSACCS2	<--	Local Health_System	1.070	0.270	3.955	0.000	par-5
Time2	<--	Wish to_Reallocate_Time	1.005	0.238	4.215	0.000	par-7
Time3	<--	Wish to_Reallocate_Time	1.000				
Time1	<--	Wish to_Reallocate_Time	0.988	0.256	3.862	0.000	par-8
time4	<--	Wish to_Reallocate_Time	1.444	0.283	5.096	0.000	par-17

Standardized Regression Weights

			Estimate
Distributive_Equity	<--	Local Health_System	0.575
Distributive_Equity	<--	COPING	0.311
Distributive_Equity	<--	process	0.302
Distress	<--	Distributive_Equity	0.506
Distress	<--	COPING	0.216
Wish to_Reallocate_Time	<--	COPING	0.281
Wish to_Reallocate_Time	<--	mantrino	0.271
Wish to_Reallocate_Time	<--	Distress	0.583
QUALCOM2	<--	Local Health_System	0.514
EXINTANG	<--	Distributive_Equity	0.481
INTRINSC	<--	Distributive_Equity	0.605
EXTRTANG	<--	Distributive_Equity	0.725
HCSEFF2	<--	Local Health_System	0.520
HBSACCS2	<--	Local Health_System	0.453
Time2	<--	Wish to_Reallocate_Time	0.397
Time3	<--	Wish to_Reallocate_Time	0.434
Time1	<--	Wish to_Reallocate_Time	0.348
time4	<--	Wish to_Reallocate_Time	0.567

Means

	Estimate	S.E.	C.R.	P	Label
COPING	11.758	0.157	75.050	0.000	par-28
process	2.046	0.050	40.761	0.000	par-29
mantrino	2.104	0.042	49.802	0.000	par-34

Intercepts

	Estimate	S.E.	C.R.	P	Label

Distress	11.059	0.953	11.605	0.000	par-30
HCSEFF2	3.133	0.048	65.885	0.000	par-22
HBSACCS2	3.157	0.059	53.710	0.000	par-23
QUALCOM2	2.595	0.055	46.862	0.000	par-24
EXINTANG	10.059	0.497	20.236	0.000	par-25
INTRINSC	8.225	0.653	12.589	0.000	par-26
EXTRTANG	8.567	0.955	8.972	0.000	par-27
Time3	0.901	0.477	1.890	0.059	par-31
Time2	1.662	0.527	3.153	0.002	par-32
Time1	1.640	0.595	2.756	0.006	par-33
time4	-0.205	0.507	-0.404	0.686	par-35

Covariances

	Estimate	S.E.	C.R.	P	Label
process <--> Local Health_System	0.031	0.028	1.126	0.260	par-13
COPING <--> Local Health_System	0.032	0.085	0.378	0.705	par-14
COPING <--> process	0.061	0.122	0.502	0.616	par-15
mantrino <--> COPING	0.159	0.103	1.541	0.123	par-16
mantrino <--> Local Health_System	0.011	0.021	0.535	0.592	par-19
mantrino <--> process	0.087	0.033	2.612	0.009	par-20

Correlations

	Estimate
process <--> Local Health_System	0.105
COPING <--> Local Health_System	0.035
COPING <--> process	0.032
mantrino <--> COPING	0.100
mantrino <--> Local Health_System	0.046
mantrino <--> process	0.171

Variances

	Estimate	S.E.	C.R.	P	Label
Local Health_System	0.146	0.049	3.002	0.003	par-36
COPING	5.867	0.537	10.932	0.000	par-37
process	0.602	0.055	10.932	0.000	par-38
4e	0.396	0.147	2.702	0.007	par-39
1d	6.011	0.642	9.366	0.000	par-40
mantrino	0.427	0.039	10.932	0.000	par-41
5t	0.086	0.041	2.088	0.037	par-42
2h	0.646	0.074	8.752	0.000	par-43
3e	3.082	0.313	9.842	0.000	par-44
2e	3.476	0.395	8.795	0.000	par-45
ih	0.395	0.050	7.855	0.000	par-46
3h	0.536	0.068	7.935	0.000	par-47
1e	4.551	0.670	6.796	0.000	par-48
1t	1.788	0.172	10.376	0.000	par-49
3t	1.085	0.109	9.934	0.000	par-50
2t	1.361	0.134	10.151	0.000	par-51
4t	1.106	0.129	8.555	0.000	par-52

Squared Multiple Correlations

	Estimate
Distributive_Equity	0.573
Distress	0.376
Wish to_Reallocate_Time	0.658
time4	0.322
Time2	0.157
Time3	0.188
Time1	0.121
HCSEFF2	0.270
EXTRTANG	0.526
INTRINSC	0.366
EXINTANG	0.231
QUALCOM2	0.264
HBSACCS2	0.205

APPENDIX 8:

SEM Analysis - *Stage THREE* Model (Alternative)

Fit Measures

Fit Measure	Default model	Saturated	Independence	Macro
Discrepancy	83.164	0.000	9770.751	CMIN
Degrees of freedom	67	0	105	DF
P	0.088		0.000	P
Number of parameters	52	119	14	NPAR
Discrepancy / df	1.241		93.055	CMINDF
RMR				RMR
GFI				GFI
Adjusted GFI				AGFI
Parsimony-adjusted GFI				PGFI
Normed fit index	0.991	1.000	0.000	NFI
Relative fit index	0.987		0.000	RFI
Incremental fit index	0.998	1.000	0.000	IFI
Tucker-Lewis index	0.997		0.000	TLI
Comparative fit index	0.998	1.000	0.000	CFI
Parsimony ratio	0.638	0.000	1.000	PRATIO
Parsimony-adjusted NFI	0.633	0.000	0.000	PNFI
Parsimony-adjusted CFI	0.637	0.000	0.000	PCFI
Noncentrality parameter estimc	16.164	0.000	9665.751	NCP
NCP lower bound	0.000	0.000	9344.606	NCPLO
NCP upper bound	43.501	0.000	9993.195	NCPHI
FMIN	0.348	0.000	40.882	FMIN
F0	0.068	0.000	40.442	F0
F0 lower bound	0.000	0.000	39.099	F0LO
F0 upper bound	0.182	0.000	41.813	F0HI
RMSEA	0.032		0.621	RMSEA
RMSEA lower bound	0.000		0.610	RMSEALO
RMSEA upper bound	0.052		0.631	RMSEAHI
P for test of close fit	0.927		0.000	PCLOSE
Akaike information criterion (AIC	187.164	238.000	9798.751	AIC
Browne-Cudeck criterion	194.129	253.938	9800.626	BCC
Bayes information criterion				BIC
Consistent AIC				CAIC
Expected cross validation indes	0.783	0.996	40.999	ECVI
ECVI lower bound	0.715	0.996	39.655	ECVILO
ECVI upper bound	0.897	0.996	42.369	ECVIHI
MECVI	0.812	1.063	41.007	MECVI
Hoelter .05 index	251		4	HFIVE
Hoelter .01 index	279		4	HONE

Regression Weights

			Estimate	S.E.	C.R.	P	Label
Distributive_Equity	<--	Local Health_System	1.449	0.400	3.619	0.000	par-4
Distributive_Equity	<--	COPING	0.124	0.033	3.717	0.000	par-12
Distributive_Equity	<--	process	0.375	0.102	3.692	0.000	par-13
Distress	<--	Distributive_Equity	1.629	0.317	5.144	0.000	par-6
Distress	<--	COPING	0.276	0.079	3.493	0.000	par-11
Wish to_Reallocate_Time	<--	Distress	0.095	0.021	4.446	0.000	par-9
Wish to_Reallocate_Time	<--	COPING	0.084	0.026	3.239	0.001	par-10
QUALCOM2	<--	Local Health_System	1.147	0.277	4.147	0.000	par-1
EXINTANG	<--	Distributive_Equity	1.000				
INTRINSC	<--	Distributive_Equity	1.471	0.257	5.727	0.000	par-2
EXTRTANG	<--	Distributive_Equity	2.334	0.383	6.095	0.000	par-3
HCSEFF2	<--	Local Health_System	1.000				
HBSACCS2	<--	Local Health_System	1.070	0.270	3.955	0.000	par-5
Time2	<--	Wish to_Reallocate_Time	0.821	0.194	4.235	0.000	par-7
Time3	<--	Wish to_Reallocate_Time	1.000				
Time1	<--	Wish to_Reallocate_Time	0.935	0.219	4.274	0.000	par-8
Time4	<--	Distress	0.161	0.023	6.857	0.000	par-14
Time4	<--	mantrino	0.476	0.111	4.271	0.000	par-15

Standardized Regression Weights

			Estimate
Distributive_Equity	<--	Local Health_System	0.575
Distributive_Equity	<--	COPING	0.311
Distributive_Equity	<--	process	0.302
Distress	<--	Distributive_Equity	0.506
Distress	<--	COPING	0.216
Wish to_Reallocate_Time	<--	Distress	0.441
Wish to_Reallocate_Time	<--	COPING	0.306
QUALCOM2	<--	Local Health_System	0.514
EXINTANG	<--	Distributive_Equity	0.481
INTRINSC	<--	Distributive_Equity	0.605
EXTRTANG	<--	Distributive_Equity	0.725
HCSEFF2	<--	Local Health_System	0.520
HBSACCS2	<--	Local Health_System	0.453
Time2	<--	Wish to_Reallocate_Time	0.431
Time3	<--	Wish to_Reallocate_Time	0.577
Time1	<--	Wish to_Reallocate_Time	0.438
Time4	<--	Distress	0.391
Time4	<--	mantrino	0.244

Means

	Estimate	S.E.	C.R.	P	Label
COPING	11.758	0.157	75.050	0.000	par-28
process	2.046	0.050	40.761	0.000	par-29
mantrino	2.104	0.042	49.802	0.000	par-35

Intercepts

	Estimate	S.E.	C.R.	P	Label

Distress	11.059	0.953	11.605	0.000	par-30
HCSEFF2	3.133	0.048	65.885	0.000	par-22
HBSACCS2	3.157	0.059	53.710	0.000	par-23
QUALCOM2	2.595	0.055	46.862	0.000	par-24
EXINTANG	10.059	0.497	20.236	0.000	par-25
INTRINSC	8.225	0.653	12.589	0.000	par-26
EXTRTANG	8.567	0.955	8.972	0.000	par-27
Time3	1.022	0.443	2.305	0.021	par-31
Time2	2.278	0.477	4.780	0.000	par-32
Time1	1.899	0.536	3.544	0.000	par-33
Time4	-0.031	0.471	-0.065	0.948	par-34

Covariances

	Estimate	S.E.	C.R.	P	Label
process <--> Local Health_System	0.031	0.028	1.126	0.260	par-16
COPING <--> Local Health_System	0.032	0.085	0.378	0.705	par-17
COPING <--> process	0.061	0.122	0.502	0.616	par-18
mantrino <--> Local Health_System	0.011	0.021	0.535	0.592	par-19
mantrino <--> COPING	0.159	0.103	1.541	0.123	par-20
mantrino <--> process	0.087	0.033	2.612	0.009	par-21

Correlations

	Estimate
process <--> Local Health_System	0.105
COPING <--> Local Health_System	0.035
COPING <--> process	0.032
mantrino <--> Local Health_System	0.046
mantrino <--> COPING	0.100
mantrino <--> process	0.171

Variances

	Estimate	S.E.	C.R.	P	Label
Local Health_System	0.146	0.049	3.002	0.003	par-36
COPING	5.867	0.537	10.932	0.000	par-37
process	0.602	0.055	10.932	0.000	par-38
4e	0.396	0.147	2.702	0.007	par-39
1d	6.011	0.642	9.366	0.000	par-40
4t	0.270	0.098	2.770	0.006	par-41
mantrino	0.427	0.039	10.932	0.000	par-42
2h	0.646	0.074	8.752	0.000	par-43
3e	3.082	0.313	9.842	0.000	par-44
2e	3.476	0.395	8.795	0.000	par-45
ih	0.395	0.050	7.855	0.000	par-46
3h	0.536	0.068	7.935	0.000	par-47
1e	4.551	0.670	6.796	0.000	par-48
1t	1.645	0.178	9.252	0.000	par-49
3t	0.893	0.124	7.185	0.000	par-50
2t	1.316	0.141	9.317	0.000	par-51
t5	1.260	0.115	10.932	0.000	par-52

Squared Multiple Correlations

	Estimate
Distributive_Equity	0.573
Distress	0.376
Wish to_Reallocate_Time	0.393
Time4	0.227
Time2	0.186
Time3	0.333
Time1	0.191
HCSEFF2	0.270
EXTRTANG	0.526
INTRINSC	0.366
EXINTANG	0.231
QUALCOM2	0.264
HBSACCS2	0.205

APPENDIX 9:

SEM Analysis - *Stage THREE* Model (Final)

Fit Measures

Fit Measure	Default model	Saturated	Independence	Macro
Discrepancy	94.514	0.000	10796.868	CMIN
Degrees of freedom	79	0	120	DF
P	0.112		0.000	P
Number of parameters	56	135	15	NPAR
Discrepancy / df	1.196		89.974	CMINDF
RMR				RMR
GFI				GFI
Adjusted GFI				AGFI
Parsimony-adjusted GFI				PGFI
Normed fit index	0.991	1.000	0.000	NFI
Relative fit index	0.987		0.000	RFI
Incremental fit index	0.999	1.000	0.000	IFI
Tucker-Lewis index	0.998		0.000	TLI
Comparative fit index	0.999	1.000	0.000	CFI
Parsimony ratio	0.658	0.000	1.000	PRATIO
Parsimony-adjusted NFI	0.653	0.000	0.000	PNFI
Parsimony-adjusted CFI	0.657	0.000	0.000	PCFI
Noncentrality parameter estimc	15.514	0.000	10676.868	NCP
NCP lower bound	0.000	0.000	10339.150	NCPLO
NCP upper bound	44.086	0.000	11020.885	NCPHI
FMIN	0.395	0.000	45.175	FMIN
F0	0.065	0.000	44.673	F0
F0 lower bound	0.000	0.000	43.260	F0LO
F0 upper bound	0.184	0.000	46.112	F0HI
RMSEA	0.029		0.610	RMSEA
RMSEA lower bound	0.000		0.600	RMSEALO
RMSEA upper bound	0.048		0.620	RMSEAHI
P for test of close fit	0.965		0.000	PCLOSE
Akaike information criterion (AI(	206.514	270.000	10826.868	AIC
Browne-Cudeck criterion	214.550	289.372	10829.020	BCC
Bayes information criterion				BIC
Consistent AIC				CAIC
Expected cross validation inde>	0.864	1.130	45.301	ECVI
ECVI lower bound	0.799	1.130	43.888	ECVILO
ECVI upper bound	0.984	1.130	46.740	ECVIHI
MECVI	0.898	1.211	45.310	MECVI
Hoelter .05 index	255		4	HFIVE
Hoelter .01 index	282		4	HONE

Regression Weights

			Estimate	S.E.	C.R.	P	Label
Distributive_Equity	<--	Local Health_System	1.449	0.400	3.619	0.000	par-3
Distributive_Equity	<--	COPING	0.124	0.033	3.717	0.000	par-5
Distributive_Equity	<--	process	0.375	0.102	3.692	0.000	par-6
Distress	<--	Distributive_Equity	1.629	0.317	5.144	0.000	par-9
Distress	<--	COPING	0.276	0.079	3.493	0.000	par-10
manage	<--	Distress	0.086	0.016	5.362	0.000	par-7
Wish to_Reallocate_Time	<--	Distress	0.095	0.021	4.446	0.000	par-8
manage	<--	mantrino	0.239	0.074	3.253	0.001	par-11
Wish to_Reallocate_Time	<--	COPING	0.084	0.026	3.239	0.001	par-12
EXINTANG	<--	Distributive_Equity	1.000				
INTRINSC	<--	Distributive_Equity	1.471	0.257	5.727	0.000	par-1
EXTRTANG	<--	Distributive_Equity	2.334	0.383	6.095	0.000	par-2
HCSEFF2	<--	Local Health_System	1.000				
Time2	<--	Wish to_Reallocate_Time	0.821	0.194	4.235	0.000	par-4
HBSACCS2	<--	Local Health_System	1.070	0.270	3.955	0.000	par-14
QUALCOM2	<--	Local Health_System	1.147	0.277	4.147	0.000	par-15
Time1	<--	Wish to_Reallocate_Time	0.935	0.219	4.274	0.000	par-21
MEETINGS	<--	manage	1.000				
PAPERWRK	<--	manage	0.990	0.139	7.123	0.000	par-22
Time3	<--	Wish to_Reallocate_Time	1.000				

Standardized Regression Weights

			Estimate
Distributive_Equity	<--	Local Health_System	0.575
Distributive_Equity	<--	COPING	0.311
Distributive_Equity	<--	process	0.302
Distress	<--	Distributive_Equity	0.506
Distress	<--	COPING	0.216
manage	<--	Distress	0.377
Wish to_Reallocate_Time	<--	Distress	0.441
manage	<--	mantrino	0.219
Wish to_Reallocate_Time	<--	COPING	0.306
EXINTANG	<--	Distributive_Equity	0.481
INTRINSC	<--	Distributive_Equity	0.605
EXTRTANG	<--	Distributive_Equity	0.725
HCSEFF2	<--	Local Health_System	0.520
Time2	<--	Wish to_Reallocate_Time	0.431
HBSACCS2	<--	Local Health_System	0.453
QUALCOM2	<--	Local Health_System	0.514
Time1	<--	Wish to_Reallocate_Time	0.438
MEETINGS	<--	manage	0.834
PAPERWRK	<--	manage	0.811
Time3	<--	Wish to_Reallocate_Time	0.577

Means

	Estimate	S.E.	C.R.	P	Label
COPING	11.758	0.157	75.050	0.000	par-29

process	2.046	0.050	40.761	0.000	par-30
mantrino	2.104	0.042	49.802	0.000	par-37

Intercepts

	Estimate	S.E.	C.R.	P	Label
Distress	11.059	0.953	11.605	0.000	par-31
HCSEFF2	3.133	0.048	65.885	0.000	par-23
HBSACCS2	3.157	0.059	53.710	0.000	par-24
QUALCOM2	2.595	0.055	46.862	0.000	par-25
EXINTANG	10.059	0.497	20.236	0.000	par-26
INTRINSC	8.225	0.653	12.589	0.000	par-27
EXTRTANG	8.567	0.955	8.972	0.000	par-28
Time3	1.022	0.443	2.305	0.021	par-32
Time2	2.278	0.477	4.780	0.000	par-33
Time1	1.899	0.536	3.544	0.000	par-34
MEETINGS	1.779	0.332	5.356	0.000	par-35
PAPERWRK	1.713	0.339	5.046	0.000	par-36

Covariances

	Estimate	S.E.	C.R.	P	Label
COPING <--> Local Health_System	0.032	0.085	0.378	0.705	par-13
process <--> Local Health_System	0.031	0.028	1.126	0.260	par-19
COPING <--> process	0.061	0.122	0.502	0.616	par-20
mantrino <--> Local Health_System	0.011	0.021	0.535	0.592	par-16
mantrino <--> process	0.087	0.033	2.612	0.009	par-17
mantrino <--> COPING	0.159	0.103	1.541	0.123	par-18

Correlations

	Estimate
COPING <--> Local Health_System	0.035
process <--> Local Health_System	0.105
COPING <--> process	0.032
mantrino <--> Local Health_System	0.046
mantrino <--> process	0.171
mantrino <--> COPING	0.100

Variances

	Estimate	S.E.	C.R.	P	Label
Local Health_System	0.146	0.049	3.002	0.003	par-38
COPING	5.867	0.537	10.932	0.000	par-39
process	0.602	0.055	10.932	0.000	par-40
4e	0.396	0.147	2.702	0.007	par-41
1d	6.011	0.642	9.366	0.000	par-42
mantrino	0.427	0.039	10.932	0.000	par-43
3m	0.405	0.075	5.377	0.000	par-44
4t	0.270	0.098	2.770	0.006	par-45
3e	3.082	0.313	9.842	0.000	par-46
ih	0.395	0.050	7.855	0.000	par-47
3h	0.536	0.068	7.935	0.000	par-48
1e	4.551	0.670	6.796	0.000	par-49
1t	1.645	0.178	9.252	0.000	par-50

3t	0.893	0.124	7.185	0.000	par-51
2t	1.316	0.141	9.317	0.000	par-52
2e	3.476	0.395	8.795	0.000	par-53
2h	0.646	0.074	8.752	0.000	par-54
1m	0.258	0.068	3.772	0.000	par-55
2m	0.222	0.069	3.233	0.001	par-56

Squared Multiple Correlations

	Estimate
Distributive_Equity	0.573
Distress	0.376
manage	0.203
Wish to_Reallocate_Time	0.393
MEETINGS	0.696
PAPERWRK	0.658
HBSACCS2	0.205
Time2	0.186
Time3	0.333
Time1	0.191
QUALCOM2	0.264
HCSEFF2	0.270
EXTRTANG	0.526
INTRINSC	0.366
EXINTANG	0.231

APPENDIX 10:

Supplemental Analysis

Oneway: Specialty x Fairness of Remuneration Process

Descriptives

Process of determining reimbursement fairly reresents all areas of specialization your work

	N	Mean	Std. Deviation	Std. Error
General Practitioners	105	3.8000	.9136	8.916E-02
Cognitive	55	4.0727	.8997	.1213
Procedural	33	4.4848	.5658	9.848E-02
Technical	41	3.9268	1.0097	.1577
Total	234	3.9829	.9123	5.964E-02

ANOVA

Process of determining reimbursement fairly reresents all areas of specialization your work

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.400	3	4.133	5.237	.002
Within Groups	181.532	230	.789		
Total	193.932	233			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Process of determining reimbursement fairly reresents all areas of specialization your work

Scheffe

(I) SPECCAT1	(J) SPECCAT1	Mean Difference (I-J)	Std. Error	Sig.
General Practitioners	Cognitive	-.2727	.1479	.336
	Procedural	-.6848*	.1773	.002
	Technical	-.1268	.1636	.896
Cognitive	General Practitioners	.2727	.1479	.336
	Procedural	-.4121	.1956	.221
	Technical	.1459	.1833	.889
Procedural	General Practitioners	.6848*	.1773	.002
	Cognitive	.4121	.1956	.221
	Technical	.5580	.2078	.068
Technical	General Practitioners	.1268	.1636	.896
	Cognitive	-.1459	.1833	.889
	Procedural	-.5580	.2078	.068

*. The mean difference is significant at the .05 level.

Crosstabs: Practice Arrangement x Sponsorship

OWNER * ORGCAT3 Crosstabulation

Count

		ORGCAT3			
		Solo/individual	Cost sharing only	Revenue sharing/Other	Total
OWNER	Physician	13	72	27	112
	Corporate	36	21	49	106
Total		49	93	76	218

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	45.001[a]	2	.000
Likelihood Ratio	47.099	2	.000
Linear-by-Linear Association	.001	1	.981
N of Valid Cases	218		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 23.83.

Univariate Analysis of Variance

Between-Subjects Factors

		Value Label	N
OWNER	1.00	Physician	85
	2.00	Corporate	54
ORGCAT3	1.00	Solo/individual	46
	2.00	Cost sharing only	93

Tests of Between-Subjects Effects

Dependent Variable: DISTRESS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	95.213[a]	3	31.738	3.247	.024
Intercept	31197.887	1	31197.887	3192.095	.000
OWNER	21.314	1	21.314	2.181	.142
ORGCAT3	26.541	1	26.541	2.716	.102
OWNER * ORGCAT3	13.540	1	13.540	1.385	.241
Error	1319.420	135	9.773		
Total	47610.000	139			
Corrected Total	1414.633	138			

a. R Squared = .067 (Adjusted R Squared = .047)

Between-Subjects Factors

		Value Label	N
OWNER	1.00	Physician	99
	2.00	Corporate	70
ORGCAT3	2.00	Cost sharing only	93
	3.00	Revenue sharing/Other	76

Tests of Between-Subjects Effects

Dependent Variable: DISTRESS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	67.108[a]	3	22.369	2.798	.042
Intercept	43862.123	1	43862.123	5487.370	.000
OWNER	.102	1	.102	.013	.910
ORGCAT3	49.973	1	49.973	6.252	.013
OWNER * ORGCAT3	.635	1	.635	.079	.778
Error	1318.892	165	7.993		
Total	57082.000	169			
Corrected Total	1386.000	168			

a. R Squared = .048 (Adjusted R Squared = .031)

Correlations

Correlations

		COPING	Hours worked per week (exclude on call)
COPING	Pearson Correlation	1.000	.089
	Sig. (2-tailed)	.	.202
	N	238	206
Hours worked per week (exclude on call)	Pearson Correlation	.089	1.000
	Sig. (2-tailed)	.202	.
	N	206	207

Frequencies

Statistics

		COPING	PROCESS	Efficiency of health care system in your community	Access to community-based services	MANTRINO
N	Valid	238	235	237	221	238
	Missing	2	5	3	19	2
Mean		11.7563	2.0468	3.1350	2.9367	2.1050
Median		12.0000	2.0000	3.0000	3.0000	2.0000

Statistics

		Current method of reimbursement is appropriate	ORGDUM2	DISTRESS	EXINTANG	INTRINSC
N	Valid	237	237	237	225	237
	Missing	3	3	3	15	3
Mean		2.3671	.4346	17.9241	12.2978	11.4852
Median		2.0000	.0000	18.0000	12.0000	12.0000

Statistics

		EXTRTANG	TIME1A	TIME3	TIME4
N	Valid	237	240	240	240
	Missing	3	0	0	0
Mean		13.7468	3.7833	3.7125	3.8542
Median		14.0000	4.0000	4.0000	4.0000