AN EXAMINATION OF THREE TYPES OF HEALTH CARE RESOURCE ALLOCATION DECISIONS

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ABSTRACT

There is increased focus, both in Canada and internationally, on the processes by which health care resources are allocated. This study examines a set of resource allocation decisions to determine how these decisions are currently being made and identify the specific concerns decision makers have about resource allocation in these areas. Specifically, the project examines how decisions involving endovascular coiling, MRIs, and powered upper limb prostheses are made in three Canadian provinces: Alberta, Newfoundland, and Saskatchewan. The overall aims of the project are: 1) to identify how these decisions are currently made, 2) to compare how these decisions are made in the different service areas and in the different provinces, and 3) to recommend ways to improve current allocation processes.

With its focus on complex allocation processes, the project adopts a case study approach. The cases were developed using 43 key informant interviews and reviews of existing materials. The study found that many of the reforms proposed in the academic literature are often difficult to apply in real world situations, due to the multiple levels of decision makers, the transferability of decision making authority across decision makers and institutional history.

Given that the processes for allocating resources are often developed through and in response to the unique history and culture of the institutions in question, it is also difficult to develop decision aids that are applicable over a wide range of sites. Maintaining established and familiar processes, even those not consistent with the types of decision

aids recommended in the academic literature, may be the most efficient way of allocating resources for many organizations. The main implication of these conclusions is that improving the processes for allocating resources is likely going to require more institutionally-specific and area-of-care-specific reforms than researchers in this area have previously proposed.

DEDICATION

This work is dedicated to Aleksandra, Nina and Helena.

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CHAPTER 1: INTRODUCTION

1.1 The Problem

Politicians, government officials, health care managers and health care providers constantly face a range of difficult choices about how best to allocate limited financial and human health care resources. In Canada, there are numerous pressures on our publicly funded health care system to expand both coverage and access to services. Many of the main recommendations of the *Commission on the Future of Health Care in Canada* (2002) were for an expansion of the services provided.[1] Romanow essentially concluded that in order to sustain the values on which our publicly funded health care system is based, the system needs to provide more. While Romanow argues for increases in coverage, the public seem increasingly concerned about the level of access they have to the services which are already covered by public programs (Blendon, Schoen, DesRohes, Osborn & Scoles, 2002; CMAJ, 2004). Further demands come from various interest and disease groups, all hoping to expand funding and extend coverage in their particular area of concern. There are increased public expectations about the level of care Canadians should receive and how long they should have to wait for it (Commission on the Future of Health Care in Canada, 2002). There are also demands arising from the continual array of new medical technologies, procedures and pharmaceutics becoming available.

[1] The Commission on the Future of Health Care in Canada was headed by Roy Romanow and is often referred to as the Romanow Commission. This Commission advocated the expansion of diagnostic services, home care, primary care, the better use of electronic health records, improved access to rural health and wider coverage for catastrophic drug costs.

These calls to expand coverage, improve access and provide new services need to be balanced by the fiscal capacities of the provinces. Most provincial governments are under considerable fiscal pressures, even after the increased funding given to them under the 2003 *Health Care Renewal Accord* ("Ottawa Sparks," 2004). While the fiscal situation across the country shows signs of improving, every province, regional health authority and hospital still has to choose between which services they will provide and which they will not. Such choices are not limited to Canada nor to health care. When financial and human resources are scarce and can be employed to achieve a number of social ends, choice is always necessary (Fuchs, 1974). Yet choices about the allocation of health care resources can leave people in pain and suffering, or even facing death. As Calabresi and Bobbitt (1978) note, health resource allocation decisions are often "tragic choices."

Both Alberta's Premier's Advisory Council on Health (2003) and the Supreme Court of Canada (Auton v. British Columbia, 2004) have concluded that public Medicare was never intended to cover all the health care services that Canadians may need. The *Canada Health Act* (1984) dictates only that selected "medically necessary" services have to be covered in order for provincial health plans to receive federal cost-sharing reimbursements. Notwithstanding the intended incomplete coverage of our public health insurance system, questions concerning coverage, levels of service and access are at the very centre of the debate about its sustainability. On the one hand, if coverage is too wide, the financial pressures on the public system may threaten its survival. On the other hand, if the coverage of services is too narrow, many people will be denied care they desperately need. If the level of services is inadequate, Canadians will increasingly

question whether the health care system lives up to its claim of providing comprehensive care or even whether a single-tiered public system is worth preserving.

Decisions about how to invest public funds directed to health care determine which health services will be covered and at what levels. In other words, resource allocation decisions determine which services are available to Canadians and indirectly how long people have to wait to access them. Resource allocations also help determine whether the health care system as a whole is able to achieve crucial goals such as maximizing its effect on the population's health, improving on measurable outcomes, and achieving a high level of user satisfaction.

Given its importance, it is not surprising that there already is a great deal written on health resource allocation, both in Canada and internationally. There are over twenty books and hundreds of articles written on different aspects of how health care should be allocated or rationed. Much of this literature, however, can be classified as either general accounts of the problem of health resource allocation, commentaries on previous attempts to ration care, examinations of ethical concerns, or proposals for reform. What is missing are many empirical accounts examining how resource allocation decisions are made. Certain high profile attempts to prioritize services, e.g., in Oregon, New Zealand, Netherlands, have been reported on in detail. Selected individual cases of rationing have received a good deal of attention (Ham, 1999; Feek, McKean, Henneveld, Barrow, Edgar, & Paterson, 1999; Ubel, 2001; Supreme Court of Canada, Auton v. British Columbia, 2004).

However health resource allocation decisions are not rare events. While much is written on health resource allocation, there remains little insight into how these common, but critically important, decisions are regularly made. This lack of knowledge severely limits our ability, both as researchers and as Canadians, to suggest improvements in the manner in which health care resources are allocated in this country.

1.2 Approaches to Studying the Problem

In his book *Coping with Uncertainty* (1980), David Hunter examined, in great detail, how resource allocation decisions were made in the late 1970's by two regional health authorities in Great Britain. The focus of Hunter's study was not on health resource allocation per se, but rather on testing theories of managerial decision making, specifically in the United Kingdom. Much has likely changed, however, regarding the delivery of health care and the processes for allocating resources since Hunter finished his study in 1977.

In Canada, three groups of researchers have conducted fairly extensive work in the areas of resource allocation and priority setting. Douglas Martin, Peter Singer and others associated with the Joint Centre for Bioethics at the University of Toronto have used Norman Daniel's concept of *accountability for reasonableness* as a framework for evaluating priority setting decisions.[2] Through a series of studies, this group has applied the *accountability for reasonableness framework* to examine the views of hospital

[2] Accountability for reasonableness is described in detail below in section 2.4.7.

executives about the level of fairness in their institutions (Reeleder, Martin, Keresztes & Singer, 2005), decision-making during the SARS crisis (Bell, Hyland, DePellegrin, Upshur, Bernstein & Martin, 2004), priority setting in hospitals and regional authorities (Gibson, Martin & Singer, 2004), drug formulary decisions (Martin, Hollenberg, Macrae, Madden & Singer, 2003) and hospital strategic planning (Martin, Shulman, Santiago-Sorrell, & Singer, 2003). Martin's group has identified a number of factors which decision makers in Canada consider when allocating health care resources, including strategic fit with the organization's goals, "alignment with external directives," clinical impact, and the needs of the community (Gibson, Martin & Singer, 2004, p. 2). As reported in the interviews for this project, many decision makers recognize the accountability for reasonableness approach as a potential way of improving priority setting within their organizations.

Another group of researchers who have contributed valuable insight in this area are Craig Mitton (UBC) and Cam Donaldson (Newcastle upon Tyne). Through a series of articles (Mitton & Donaldson, 2001; 2003a; 2003b; 2003c; 2004; Mitton & Patten, 2004; Mitton, Patten, Waldner & Donaldson, 2003; Mitton, Donaldson, Waldner & Eagle, 2003; Halma, Mitton, Donaldson, & West, 2004), Mitton, Donaldson and their colleagues have advocated and used a program budgeting and marginal analysis (PBMA) approach as a method for improving health resource allocations.[3] Like Martin's group, Mitton and Donaldson's studies provide good insights into how health resource allocations are made and offer another promising method for improving the allocation process.

[3] PBMA is described in detail below in section 2.4.6.

The third group of Canadian researchers who have completed substantial work in this area are Jerry Hurley, John Eyles, Stephen Birch, Mia Giacomini, Brian Hutchison and others associated with McMaster University's Centre for Health Economics and Policy Analysis (Eyles, Birch, Chambers, Hurley & Hutchison, 1991; Birch & Chambers, 1993; Birch, Ryles, Hurley, Hutchison & Chambers, 1993; Eyles & Birch, 1993; Birch, Eyles & Newbold, 1996; Newbold, Eyles, Birch & Spencer, 1998). Much of their work is focused on needs-based models for allocating health care resources. The aim of the needs-based approach is to fairly and efficiently allocate resources across populations by accounting for health and socio-economic differences between the populations.[4]

All three groups study how resource allocation decisions are made in Canada primarily from the perspective of their particular conceptual framework, i.e., accountability for reasonableness, PBMA, or needs-based models.[5] Similarly, all three groups have contributed to our understanding of how resource allocation decisions are made and offer plausible recommendations for improving the allocation of health care resources. Nevertheless, there is a risk that their empirical investigations are influenced too much by their conceptual frameworks. Rather than taking a proposed framework and testing to see whether it is applicable within the Canadian context, I propose a more grounded theory approach which first tries to determine how allocation decisions are currently being made,

[4] Needs-based models are described in detail below in section 2.4.3.

[5] One exception is Singer, Martin, Giacomini and Purdy (2000), who do use a grounded theory, case study approach to study priority setting within two government advisory panels: the Cancer Care Ontario policy advisory committee and the Cardiac Care Network of Ontario expert panel on intracoronary stents and abciximab.

without the investigation being guided by a pre-established framework for improving resource allocation. There is value in clearly determining how these decisions are made outside of any consideration of an evaluative framework. As Hunter (1980) observes, "sensible reforms must depend on knowledge of the world as it is, just as much as on knowledge of the world as it ought to be" (p. 4). It is possible that examining resource allocations using a pre-established framework may cause us to overlook other possible routes for reform or to overlook difficulties in applying these models within real world conditions. It is also plausible, given the amount of work already completed using these established frameworks, that taking a new, more grounded theory approach is the most promising way to make further contributions to research in this area.

1.3 Focus of this Study

Despite eschewing the use of a pre-established framework, the researcher must still provide some focus for the project. Hurley, Cosby, Giacomini and Hutchison (2000) have conducted a fairly extensive review of approaches employed for allocating resources, including those used internationally. One of their conclusions is that,

> "The nature of resource allocations in the health sector is too complex for a single, over-arching approach. [A future research program in this area] ...should be oriented towards answering a coordinated set of more focused questions on specific aspects of resource allocation processes and decisions. ...Regardless of the precise approach taken, the program needs to focus on particular types of contexts for resource allocation decisions. ...While this approach does raise issues of generalizability, there is currently enough writing about resource allocations at a broad, generic level that useful contributions are more likely to come in moving from the particular to the general than vice versa" (pp. 13 -4).

This project is an empirical examination of how resource allocations are made by provincial governments and regional health authorities. Following Hurley et al.'s (2000) recommendation, rather than conducting a general examination, the project focuses on particular cases of resource allocation. The project aims to determine how resource allocations are made in three health services areas (acute care, diagnostic testing, and rehabilitation) in three provinces. Specifically, it examines how decisions are made in Alberta, Newfoundland, and Saskatchewan involving endovascular coiling (a treatment for cerebral aneurysms), magnetic resonance imagining (MRI), and powered upper limb prostheses.

Given that the project's aim is to understand how particular decisions are made in different service areas, the project adopts a case study approach. Stake (2005) says that "[c]ase study is not a methodological choice but a choice of what is to be studied" (p. 443). In selecting a case study approach, the researcher needs first to determine why he has chosen to study this particular set of cases. One of the general aims in selecting the cases for this study is to identify areas of care which are likely to be fairly different in terms of resource allocation. There are very few references within the health resource allocation literature about possible differences in distinct areas of resource allocation. Comparing diverse cases of resource allocation should highlight any differences, to the extent that they do exist, in how resources are allocated across various areas of care.

With a focus on endovascular coiling, MRI, and powered upper limb prostheses, there is a good level of variation across the cases. For example, there are differences in who is

likely to be the primary advocate for expanding coverage, the size of their likely patient populations, their potential impact on patients, the strength of evidence for their effectiveness, the capital costs involved, and differences in their cost per case treated. In all of these cases, however, key factors, such as use of evidence, cost considerations, ethical considerations and accountability, are applicable.

The cases are also all interesting examples of resource allocation in themselves. Each raises unique issues. With endovascular coiling, there is the issue of its high start-up costs and small patient population balanced against the fact that it is a potentially life-saving procedure. Decisions around MRIs have a greater degree of public and media scrutiny than most other service areas. Also with MRI, because of its wide range of applicability, there is the issue of *usage creep*, where a MRI machine is purchased to serve one patient population, but ends up being used by a wider range of patients because of its increased availability. With powered upper limb prostheses, there are issues arising from the substantial variation in public coverage from province to province and its very small patient population.

In their study on hospital care rationing in the United Kingdom and the United States, Aaron and Schwartz (1984) conclude that the mechanisms of health care rationing and the public's reaction to it is quite different between the countries due, in part, to organizational and cultural differences between the two health care systems. In examining resource allocation decisions in Canada, it is important to consider the extent to which the organizational and cultural differences between provincial health care

systems result in different mechanisms of resource allocation. In order to capture any inter-provincial variation, the three services selected were examined in three provinces: Alberta, Newfoundland, and Saskatchewan. The choice of provinces was based on considerations about geographic distribution of the provinces across the country, the size of the provinces, the geographic distribution of their populations, structure of their health care systems, and the financial strength of the provinces. In order to provide a reasonable scope to the project, one regional health authority is focused on in each province. In order to help secure confidentiality, the three regional authorities have been identified as Region A (Alberta), Region B (Newfoundland), and Region C (Saskatchewan). All three of the regional authorities provide a wide range of health care services, including tertiary care.

Next to determining which cases to study, it is also important to determine the appropriate level of focus for the cases. Instead of examining specific decisions, the project focuses on the processes and factors used by an organization to make decisions in each particular area. In other words, instead of looking at how an organization decided in one instance of allocating resources, the focus is on the processes they usually use to make decisions in each of the three selected services. Examining general processes, rather than specific decisions, allows for sufficient focus while increasing the generalizability of the results. Descriptions of the decision making process do, where appropriate, make reference to specific allocation decisions in order to accurately describe the process used.

Colleen Flood (2002) claims that "the processes decision makers currently use to determine what Canada's publicly funded healthcare systems will cover appear haphazard, and the principles that guide decision-making seem to be either non-existent or not transparent" (para. 2). This research study will contribute to our understanding of how resource allocation decisions are made in Canada and about which principles and factors are used to guide these decisions. The project will also recommend improvements to the way resource allocations are made, either generally or more specifically in the three selected service areas.

1.4 Study Objectives

The aims of this study are:

(i) To describe how resource allocation decisions are made in the selected areas of endovascular coiling, MRIs, and powered upper limb prostheses, in three provinces: Alberta, Newfoundland, and Saskatchewan.

(ii) To identify similarities and differences in the decision making processes across the three areas of care and across the three provinces.

(iii) To consider the likelihood that approaches proposed in the academic literature for improving resource allocation would be useful for improving decision making in the selected cases.

(iv) To identify recommendations / best practices which the decision makers interviewed during this study have for resource allocation.

(v) To determine the types of decision aids decision makers would find useful in making resource allocation decisions. If possible, develop and pilot any decision aids identified as being useful by the decision makers interviewed during this study.

(vi) To make recommendations for improving health resource allocation either generally or within the selected cases.

(vii) To transfer research results to appropriate audiences.

1.5 Organization of the Dissertation

The structure of the dissertation is as follows. Chapter 2 presents a review of the relevant academic literature. This chapter covers specific issues related to health resource allocation, types of health care decisions, key factors often identified as important in resource allocations, proposed decision approaches for allocating resources, and background information about the three selected areas of care. The purpose of the literature review is to give sufficient context to the issues around resource allocation to allow the reader to fully understand the issues involved in the cases. This literature review also identifies key factors in terms of which the cases can be compared. Chapter 3 provides an overview of the methods used in this study. Chapter 4 examines decision making in the three areas of care in Alberta and Health Region A. Chapter 5 examines decision making in Newfoundland and Labrador and Health Region B. Chapter 6 examines decision making in Saskatchewan and Health Region C. Chapter 7 compares these cases and identifies a number of the project's findings. Chapter 8 discusses possible decision aids, outlines recommendations, and presents the project's knowledge transfer strategy.

CHAPTER 2: LITERATURE REVIEW

The chapter is organized as follows: first, several distinct types of health care decisions are discussed. These distinctions will be used to help classify the allocation decisions identified in the cases. This discussion is followed by an examination of issues often raised concerning health resource allocations, including a) definitions of the terms rationing, resource allocation, and priority setting, b) the identification of key factors often identified as important to resource allocation and c) a review of proposed approaches for improving allocation processes. The chapter concludes by reviewing the three service areas to be examined. Appendix A provides a general overview of decision making within Canadian health care system as a general background for those not familiar with the Canadian system.

2.1 Types of Health Care Decisions

There are a number of ways to classify health care decisions. Perhaps the most common is in terms of macro, meso, and micro decisions. Despite common usage, it is not always clear what people refer to when using these terms. The confusion is between whether the terms refer to the people making the decisions, e.g., government (macro), health care management (meso), individual health care providers (micro), or to what the decision is about, e.g., general government policy impacting on health care (macro), program decisions (meso), decisions involving individual patients (micro). For example, van Velder, Severens & Novak (2005) use the terms in the former sense, referring to the different levels of decision makers. Murry and Elston (2005) use the terms in the latter sense, referring to what the decision is about. Others seem to straddle both aspects of the

term (e.g., Simpson, Hoffmaster & Dorian, 2005). This conflating of the two meanings may seem justified. Both senses of the terms refer to important aspects of health care decisions and there is quite often a match between the level of decision maker and the subject matter of the decision, i.e., macro-level decision makers most often make macro-level decisions. There are, however, cases where the differences between the two senses are important. For example, the provincial government (i.e., a macro level decision maker) will sometimes make decisions concerning particular health programs (i.e., a decision about a meso-level topic).

Lomas (1997) further divides macro, meso and micro decisions into six types of decisions related to the allocation of resources. These six areas are decisions about 1) funding levels, 2) funding arrangements, 3) broad service categories, 4) specific services, 5) clinical circumstances, and 6) socio-demographic circumstances. These six decision areas are presented in *Table 2.1*, along with a description and example of each. The advantage of Lomas' breakdown of allocation decisions is that it more precisely identifies the nature of the decision under consideration.

Table 2.1: Types of Resource Allocation Decisions[6]

Type of Decision	Description	Example of Possible Coverage Question
Funding Level	Macro-level decisions concerning the level of funding to the health care sector.	What proportion of the provincial budget should be directed towards health care?
Funding Arrangements	Macro-level decisions concerning broadly how the health care sector should be organized.	Should health care be provided through regional health authorities or not?
Broad Service Categories	Meso-level decisions concerning the allocation of funding across service areas.	How much of the health care budget should be directed towards acute care? Long term care? Prevention?
Specific Services	Meso-level decisions concerning the allocation of funding within one service area.	Which specific cardiac procedures should an acute care hospital offer? What guidelines should there be on ordering an MRI?
Clinical Circumstances	Micro-level decisions about what treatments a patient should receive.	When should an individual patient receive a particular treatment?
Socio-demographic Circumstances	Micro-level decisions about whether a patient's characteristics should influence their level of care.	Should alcoholics be eligible for liver transplants?

A third way of classifying health care decisions is in terms of how these decisions get made. Following similar distinctions in political science, Tuohy (1999) distinguishes the way control over health care is institutionalized as either hierarchical, market, or collegial. Hierarchical decision making is characterized by a central authority setting rules for how health care will be delivered. Market decision making refers to the situation

[6] This table is derived from one used in Chafe, R., Neville, D., Rathwell, T., Deber, R., Kenny, N., Nestman, L., et al. (2007).

in which health care decision making is driven by the multiple decisions of people buying and providers selling health care services. Collegial decision making refers to the situation in which health care decision making is primarily driven by the collective practice decisions of providers and their self-imposed guidelines. Most health care systems have elements of all three types of decision making. Tuohy uses these distinctions, however, to describe the nature of an entire health care system. She does not apply these distinctions to individual health care decisions.

In developing a taxonomy of health care decision making, Coyte, Zarnett, and Mitchell (2004) distinguish how particular health care decisions are made in terms of how centralized the decision making is. Coyte classifies a decision by whether the decision making approach is closed-door / top-down, bilateral, or hands-off / bottom-up. Closed-door / top-down is when a decision making body, e.g., a provincial government or the executive of a regional authority, makes a decision affecting the health care system without input from those who they have authority over. Bilateral decisions are decisions in which there is some level of negotiation between different groups, e.g., between the provincial and federal government or between providers and regional executives. Hands-off / bottom-up are decisions made by frontline providers. For example, whether to admit a patient to hospital would likely be a hands-off / bottom-up decision, even though it impacts on how resources are used within a hospital.

Table 2.2 classifies health care decisions in terms of the type of decision, who makes the decision, and the nature of the decision making. The resource allocation decisions

identified in the particular cases will be classified and compared in terms of these three characteristics.

Table 2.2: Classification of Health Care Decisions

Type of Decision	Who Makes the Decision?	The Nature of the Decision Making
• Funding Level • Funding Arrangements • Broad Service Categories • Specific Services • Clinical Circumstances • Socio-demographic Circumstances	• Federal Government • Provincial Government • Minister of Health • Departmental Officials • Regional Health Boards • Executives of Regional Authorities • Program Managers • Clinical Chief • Providers • Patient • Others	• Closed-Door / Top-Down • Bilateral • Hands-Off / Bottom-Up

There are likely to be numerous decisions concerning endovascular coiling, MRIs and powered upper arm prostheses which affect how resources are allocated in these three areas of care. For example, frontline providers make decisions in all three areas which affect the number of patients who receive care. These decisions in part determine the level of demand and the overall cost of these programs. The CEOs of regional health authorities must decide whether or not to offer a certain program within their organizations. There are decisions concerning where within a region to locate services. Next to identifying these various resource allocation decisions within each case, it is

useful to determine what type of decision each is. These classifications will help allow for better comparisons across the areas of care and across the provinces.

In order to be clear when using these distinctions, I will use the terms macro, meso, and micro to refer to the subject matter of the decision, i.e., general government policy impacting on health care (macro), program decisions (meso), and decisions involving individual patients (micro). In terms of meso-level decisions, these would include all decisions made at the program level, from decisions about how resource should be allocated across broad service areas to policies and guidelines made within the clinical departments.

While I have chosen to consider macro, meso and micro distinctions as referring to the type of decisions, rather than the type of decision maker, it is important to consider who makes the decision. This study will determine if there are differences in who has responsibility for making different decisions across the cases. Those likely to have decision making authority in various areas are the federal government, provincial government, Minister of Health, provincial officials, the boards of the regional health authorities, executives of the regional authorities, program managers, clinical chief, providers or patients.

2.2 Issues in Resource Allocation

There are a number of debates in the literature about the allocation of health care resources. This section reviews four of these debates. The first is about how to define the terms rationing, resource allocation, and priority setting. There are various definitions proposed in the literature. Related to the definition of rationing, there is a second debate about whether health care rationing is necessary. The third debate is whether physicians, as advocates for their patients, should be involved in rationing care. Finally, the question has arisen whether health care resources should be allocated through an explicit, public process or implicitly, as is often currently the case. The main purpose of this section is not to answer definitely the questions involved in these long running debates, but to provide an overview of the main issues in each debate as part of the overall background for this project.

2.2.1 Rationing, Resource Allocation, and Priority Setting

There is some debate over the meaning of the terms rationing, resource allocation and priority setting. Some writers see no difference in the meaning of the terms (Bell et al., 2004; Gibson, Mitton, Martin, Donaldson, & Singer, 2006; Hall, 1994; Reeleder et al., 2005). Others see clear differences in their meanings (McKneally, Dickens, Meslin and Singer, 1997). Many of the other debates about health resource allocation depend on how these terms are defined. For example, the question of whether health care rationing is necessary depends to a large extent on what is meant by rationing.

Given its negative connotations, it is perhaps not surprising that most debate is about the definition of rationing. Some writers define rationing as a type of distribution of health care resources. For example, Churchill (1987) defines rationing as "the equitable distribution of scarce resources" (Quoted in Ubel, 2001, p.12). Hadorn and Brook (1991) define rationing as the "societal toleration of inequitable access... to services deemed necessary" (p. 3331). Aaron and Schwartz (1990) adopt a more market-orientated definition, defining rationing as "denial of commodities to those who have the money to buy them" (p. 247). In terms of health care, this definition would refer primarily to limitations on private sector financing of care. Relman (1990a) defines it as "the deliberative and systematic denial of certain kinds of services, even when they are known to be beneficial because they are deemed to be too expensive" (p. 1809). Brook and Lohn (1986) define rationing as "any set of activities that determines who gets needed medical care when resources are insufficient to provide for all" (Quoted in Ubel, 2000, p.12). Norheim (1999) defines rationing as "the withholding of potentially beneficial health care through financial or organizational features of the healthcare system in question."

Ubel (2001) identifies three main fault lines which divide definitions of rationing. The first is whether the activity is explicit or not. Some definitions define rationing as occurring only in those cases where there is an explicit process for limiting care (e.g., Relman 1990a). Secondly, definitions differ as to whether rationing requires that resources are absolutely scarce, i.e., whether there is simply not enough resources in the society to meet demand, e.g., with the need for live organs, or whether it is a choice not to use more resources for health care, even though they are possibly available. Thirdly,

definitions of rationing differ over whether the services being rationed simply need to be beneficial or whether they have to be necessary to the continuance of life to be considered as rationing. Although concluding that "rationing is a word... with no single "correct" meaning" (p. 13), Ubel adopts an expansive definition where rationing occurs whether or not it is done explicitly, regardless of whether there is an absolute scarcity of resources and regardless of whether the services are necessary to save the person's life.

All of these definitions of rationing include the idea of deprivation, in that at the very least, beneficial care is not being provided because of considerations about the use of resources. There is also usually some notion of choice involved in the definitions, in the sense that the resources and technical ability could ideally be made available to provide this beneficial care. For example, we do not think of it as a case of rationing if physicians simply do not know how to treat a condition. Often the choice to limit care is made by people representing wider social concerns, e.g., a regional health authority, even if their choices ultimately impact on the care an individual patient receives. Finally, there is a sense that rationing actually affects people, i.e., that there really are people who are being denied care. For the purposes of this thesis, rationing is defined as limiting a person from getting beneficial care due to wider societal concerns about the resources required to provide that care. This definition shares the expansive view of rationing adopted by Ubel (2001).

The other two terms which need to be defined are resource allocation and priority setting. McKneally, et al. (1997) define resource allocation as "the distribution of goods and

services to programs and people" (p. 167) and this definition will be employed in this study. For the purposes of this thesis, priority setting is defined as the act of ranking, by whatever means, a set of options. With regard to health care resources, priority setting would be concerned with ranking or determining how much resources should be directed for providing different health care services.

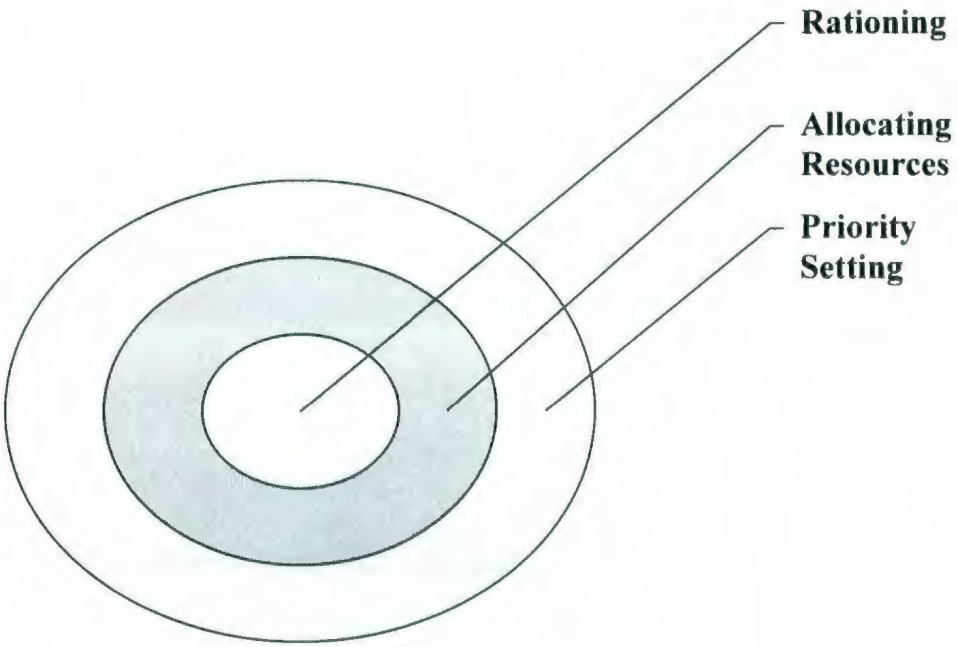
The confusion over the terms rationing, resource allocation and priority setting comes from the close connection between the three activities in regard to health care. Allocating health care resources often results in cases of rationing. If a regional authority is not allocating sufficient funds to a particular program, in the act of allocating resources, it is also rationing care. In fact, all cases of rationing are also cases of resource allocation. Yet not all resource allocation decisions are examples of rationing, because it is possible that sufficient resources are allocated to a program to provide beneficial care to all the patients who need that program or that there are programs in which care is not limited by wider societal concerns about the use of resources. Even if there are no actual examples of these cases, their possibility does allow for a conceptual distinction to be made between the two terms.

Similarly, all resource allocations are priority setting exercises. In the act of allocating resources, decision makers are also prioritizing which services to fund. But it is possible to prioritize services without actually allocating resources. A clinical department can prioritize its service requests and this ranking can be ignored by the executive of a regional authority. A health care institution can go through a priority setting exercise and

the results of the exercise can be simply rejected, so that the exercise has no affect on how resources are distributed. Priority setting exercises do not always affect the distribution of resources, but resource allocation decision do.

Chart 2.1 portrays the relationship between the terms rationing, resource allocation and priority setting in terms of their scope. Priority setting captures the widest range of activities, because it includes cases of resource allocation and rationing, but it also includes other cases of priority setting which do not affect resource allocations. Resource allocation is the second widest in scope, for it includes cases of rationing and some cases which are not examples of rationing. Rationing has the least wide application, being a sub-class, or a consequence, of resource allocation and, therefore, also a type of priority setting.

Chart 2.1: The Relationship of Rationing, Resource Allocation and Priority Setting



2.2.2 The Necessity of Health Care Rationing

Hadorn and Brook (1991) identify two types of rationing problems. The first is when a specific resource is absolutely scarce, such as with live organs, so that there is simply not enough of the resource available within the society to meet the demand for it. The second rationing problem concerns the amount of resources available for providing health care more generally. The debate about the necessity of health care rationing is primarily concerned with the second type of rationing problem. The debate essentially deals with two questions. The first is: Is there a shortage of health care resources so that providers are forced to deny some people beneficial care? In other words, is there an absolute limit,

so that society could not provide everyone care even if it tried? The second question is: Even if this shortage of resources currently exists, is there a way to provide sufficient resources so as to avoid rationing care in the future?

Three factors have given rise to the question of whether we need to ration health care. The first is the greater role played by third party payers. Before the Second World War, most health care costs were paid directly by the patient to the provider. Health care resources were primarily distributed by market forces. People received the health care they were willing and able to pay for. In the United States, during the war, companies which were forced to comply with wage and price controls began to offer expanded health benefits as a way to attract workers. In the 1940s and 1950s, the Blue Cross and Blue Shield insurance plans began and rapidly expanded. In the 1960s, the Medicare and Medicaid programs were launched. In Canada, the move towards a third party payer was even more dramatic and comprehensive (Tuohy, 1999). By the early 1970s, provincial insurance plans paid for most hospital and physician services. The rise of third party payers shielded the user of health care resources from their full cost, which were collectively borne by the people enrolled in the same insurance or health care plan. In terms of increased equity and accessibility to treatments, this arrangement was a great step forward. It separated, or partially separated, one's ability to pay from one's ability to get care. Health care resources were no longer distributed solely in terms of a person's financial means, so that many people could now receive services they would not be able to afford directly by themselves. Another affect of the rise of third party payers was that it made the provision of medical treatments more of a societal concern. The rise of

collective payment schemes, which defused the costs of health care to the individual, also made the individual's health care a collective concern.

The second factor impacting on the need for rationing was the expansion and technological advancement of the medical treatments offered. The practice of medicine has gone through tremendous changes during the last fifty years. The technologies used for treating diseases have become much more sophisticated, effective and costly. There are more drug therapies available. Many illnesses and injuries from which people previously died are now curable. There is a greater focus on treating chronic diseases. There is also a seemingly endless stream of new medical technologies brought to the market every year, many of which offer the promise of extending and improving people's lives, although sometimes at a very high financial cost.

The third factor which enhanced the focus on rationing is the dramatic increase in health care costs. Increasing costs are partly the result of the expansion in the type of treatments offered, but other factors, such as expanded access and the aging of the population, also adversely affect costs. For the past three decades, the cost of providing care has increased faster than the rate of growth in the overall economy so that an ever greater proportion of our GDP now goes to health care. This trend is ultimately unsustainable (Arron and Schwartz, 1990; Thurow, 1984; Ubel, 2001). The rising cost of health care increases the financial pressures on third party payers. Faced with rising health care costs and budgetary shortfalls, these third party payers have begun to look for ways to slow expenditures. Before the 1970s, there was little talk of explicitly rationing health care.

Previous to this period, the main focus in Canada and the United States was actually on expanding access to care. However, with the combined rise of third party payers, the development of expensive new treatments, rising health care costs, and slowing economic growth, cost containment is now a major concern.

Angell (1993) and Boyle (1984) argue that preoccupation with cutting health care spending is misguided. They contend that there are enough resources available to provide everyone beneficial care and ultimately avoid rationing if we, as a society, only use our resources intelligently. With reference to the United States, Angell points out the health care system "is embedded in a society that routinely spends billions and billions on such goods as tobacco, television ads, and cosmetics. Clearly, we as a society aren't facing scarcity; instead we are facing the inefficient and frivolous use of vast resources" (p. 284). The same claims can be made about Canada. Even though Canada spends approximately 10% of its GDP on health care, this is not to say it does not have the resources to increase its spending on health care. Given the importance of health care, it may not be unreasonable to spend 15% or 20% of GDP on care. This increased spending could presumably allow for enough resources so that we would not have to ration care. Boyle and Angell's point is that a resource shortage is not the problem. It is an issue how resources get distributed throughout the society that results in the need for rationing. Rich, Western societies have enough resources to provide beneficial health care to all their citizens; all they have to do is direct more of their wealth to health care.

Supporters of this argument hold that even if more resources are not directed towards health care, we can still avoid rationing. Angell (1993; 2000) and Relman (1990a) argue that the focus on rationing overshadows other areas of cost savings which may make rationing unnecessary. Health care costs could be contained by removing tests and procedures which are not beneficial to patients. This could be accomplished by improving evaluation of new and existing treatments, revising fee schedules so as not to encourage the increased prescription of services, and working to reduce procedures performed solely to avoid possible lawsuits, i.e., defensive medicine. The argument is that we have enough resources to avoid rationing even if we do not put more resources into the health care system, as long as we focus those resources in the right areas.

Others dispute this line of argument. Arron and Schwartz (1990) point to the rate of innovation, the price mechanisms within the health care system and the aging population as factors which will continue to increase demand and the overall cost of health care. Arron and Schwartz also say that any gains from the type of reforms which Angell and Relman suggest are likely not going to be sufficient to control costs over the long term. Kenny (2002) points to trends which result in a potentially endless demand for health care services including the increased belief in the wonders of technology, the medicalization of ever increasing areas of our lives, the blurring line between medically necessary procedures and procedures desired only to enhance someone's life style, the increase in patient's knowledge about new and experimental treatments, and the sensationalism of media cover of miracle cures. Kenny holds no amount of resources will give all the

possible health benefits of medical science to all people for the ever expanding number of conditions which could be addressed.

Others dispute the claim that we can avoid making difficult rationing decisions more from an economics perspective. Thurow (1984) holds that,

> "Although there is no magic formula for determining a precise limit on what a country can afford to spend for health care, there is a limit. Every dollar spent on health care is a dollar that cannot be spent on something else. No set of expenditures can rise faster than the gross national product forever. At some point, health care expenditures must slow down to the rate of growth of the gross national product" (p. 1569).

Weinstein (2001) makes a similar argument by equating health care spending with the standard economic argument of the commons. The idea is that if everyone continues to use as much health care as they can, soon all the available resources will be used and rationing will be forced upon us. Although both Thurow and Weinstein's arguments are based partly on abstract theory, they do rely on the common sense point that if individuals are unconstrained in their health spending, especially given the high costs of these procedures and the demand drivers identified by Kenny (2002), we will be one day in a situation where we will have to ration care, regardless of measures like the ones Angell and Relman recommend.

Whether or not rationing is necessary at a societal level, we need to recognize that individual health care organizations, regional health boards, and local hospitals do face rationing decisions on a constant basis. In fact, Ubel (2001) concludes that health care

rationing is already "ubiquitous" (p. 137) in Western medicine. Even if unnecessary care is removed or if more resources are directed towards health care, there will still be the need to make tough decisions about which people should get scare resources, especially at the hospital or regional level. There may be sufficient resources in society to avoid rationing, but allocating these resources to health would require substantial shifts in resources away from other areas and it is not likely to happen. Whether or not it is necessary, we can expect rationing to continue within our current health care system.

2.2.3 Physicians and Rationing

Another key debate is the role physicians should play in rationing health care. Physicians have a great deal of influence over health care demand. Leaf (1984) estimates that between 70% and 80% of health care expenditures are determined by physicians. Often physicians present themselves as being solely advocates for their patients. Under this *ideal advocate model*, physicians work only to serve the best medical interest of their patients. When deciding on a treatment strategy, a physician's only concern is for delivering "the best treatments and outcomes which are medically possible" on a patient by patient basis (Daniels, 1987, p. 69). The ideal advocate model entails focusing solely on providing what is most beneficial for each patient, separate from any concern about how the treatment may affect the resources available for other patients or the position of third parties.

In recent years, there has been a challenge to this traditional model of the physician-patient relationship. For many, the role of the physician has changed from someone who

acts solely in the interest of the patient to someone who has obligations both to the patient and to other interested parties (Leaf, 1984; McKneally, Dickens, Meslin, and Singer, 1997; Thurow, 1984; Ubel, 2000; Weinstein, 2001). The physician has seemingly gained the added responsibility of partially managing, and rationing, the amount of medical resources used. In providing care, the physician is asked not only to determine whether the treatment is medically beneficial to their patients, but also consider how treatments, particularly their costs, will affect other patients and society more generally. The threat to the ideal advocate model is not internal to it. It is not that there is some contradiction or something unethical per se in doctors aiming only to serve the best interest of their patients. In fact, there is seemingly something ethically disturbing with types of *bedside rationing* which say that physicians should do less than their very best for their patients in order to save money. Those who oppose the ideal advocate model argue that it misses the fact that physicians do make decisions which affect the amount of medical resources left for other people and that this fact too needs to be considered in making clinical decisions (Hall, 1994; Mechanic, 1997; Menzel, 1993; Ozar, 1987; Weinstein, 2001). It is not that there is anything wrong with the ideal advocate model itself. It is just that it is no longer feasible given the climate of economic constraint in which health care is currently delivered.

Boyle (1984) argues that the rejection of the ideal advocate model is tantamount to doctors learning to say "no" to their patients. He protests that "clearly, in adherence to the principles of our profession, physicians should not accept a dictate that they will act other than in the best interest of the patients under their care" (p. 783). For supporters of

the ideal advocate model, it is third party payers who should be responsible for making these difficult allocation decisions, not frontline physicians. Although her argument is clearly more applicable to the American health care system and the relationship between physicians and HMOs, Angell (1985; 1993) argues bedside rationing is nothing less than selling out the entire ethical basis of the physician-patient relationship in order to put third party payers in a better financial position.

Much of the debate about whether physicians should ration care rests on the question of whether rationing is necessary. Angell (1985; 1993) and Boyle's (1985) arguments against physicians rationing care are based to a large extent on their contention that it is not necessary to ration care. Whether or not physicians should ultimately be asked to ration care, the fact is that physicians do play a role in rationing care (Arron & Schwartz, 1990) and physicians are already often mindful of resource constraints when prescribing treatments (Ubel, 2000). For Ubel, the real debate has moved on to the question of what type of supports we should provide physicians to help them in making rationing decisions.[7]

Proponents of bedside rationing argue that rationing is a fact of modern medical life. Given that rationing does occur, proponents argue that physicians are well suited to play a key role in determining how these rationing decisions get made. There are numerous

[7] Ubel (2001) recommends training physicians in the use of cost-effectiveness analysis. Hall (1994) suggests we need to develop a system of educational, professional and financial incentives to help facilitate physician rationing.

reasons why physicians are given a great deal of clinical autonomy. Many of the same reasons for granting this clinical autonomy are also reasons why physicians should be involved in making rationing decisions. Physicians are the experts in the field and therefore best suited to determining the seriousness of a patient's condition. They have the most intimate knowledge of their patients' cases, their concerns and their treatment preferences (Mechanic, 1987). Their closeness to the clinical situation means that they are less likely to discount the suffering rationing is causing their patients (Mechanic, 1987). Every clinical situation depends on a certain level of judgment. Hall (1994) argues that "no set of rules [determined outside the specific clinical situation] could possibly be detailed enough to capture all of the nuanced and judgmental aspects of medical decision-making" (p. 319). Hall also argues, given that rationing does occur, letting other groups make these decisions is "inconsistent with the values of the medical professionalism," including respect for professional autonomy (p. 325).

There are a number of other arguments supporters of bedside rationing raise. Physician rationing is seen to be less influenced by interest groups and unfair lobbying (Hall, 1994; Mechanic, 1997). Because of the asymmetry of medical knowledge between the patient and the physician, patients are never really sure that they are being denied a treatment because they do not need it, i.e., it would not be medically beneficial to them, or because of rationing, i.e., the treatment is denied in order to save resources. Although raising some ethical concerns, bedside rationing can be used to limit public discontent with rationing, as has been the case in the United Kingdom (Arron & Schwarz, 1984; 1990; Arron, Schwarz, & Cox, 2005). Finally, if there is to be rationing, physicians will have to

play some role in it, for it is physicians who ultimately interpret and implement any rationing rules, even if they made by other groups (Hall, 1994). If rationing does occur, physicians will be involved.

2.2.4 Explicit or Implicit Rationing

Health care rationing can either be done explicitly or implicitly. Coast (1997) defines explicit rationing as the rationing of health care so that "decisions about the provision of health care are clear, as are the reasons for those decisions" (p. 1118). As the name suggests, explicit rationing entails that the public know that health care rationing is occurring and they know the reasons for why rationing decisions are made and how these decisions are made. Some explicit exercises also allow the public to be involved in making the rationing decisions, usually through some type of public participation exercise. Explicit rationing fits well with democratic ideals of openness, transparency, and public involvement in decision making. Daniels (2000a; 2000b) and Daniels & Sabin (1997) argue that such transparency is necessary to ensure that rationing is done fairly. McKneally et al. (1997) state that "because there is no overarching theory of justice to balance competing claims between morally relevant criteria such as need and benefit, fair, open and publicly defensible resource allocation procedures are critical" (p. 164). There is also the belief that having an explicit process for rationing care may result in a more efficient use of our health care resources (Coast, 1997; Mechanic, 1995).

Implicit rationing occurs when the rationing decisions, the reasons for them or the process for making the decisions are not clearly expressed (Coast, 1997). No one advocates that

every aspect of the rationing of health care should be done in secret or that we should try to disguise rationing decisions as being simply clinical decisions, as sometimes occurs (Coast, 1997; Hunter, 1995). Those who support implicit rationing advocate, however, that the resource allocation decisions are better made internally within health care organizations, by decision makers who have a broader understanding of the implications of rationing.

Those who support implicit rationing also usually point to the practical difficulties of explicitly rationing care. For example, Hunter (1995) holds that large public debates about which services should be covered are not an effective or sensible way to make such decisions. He writes:

> "A national debate that seeks to explore the complexity of the rationing issue amounts to a contradiction in terms. A national debate, aided by a media whose interest in health care stops at waiting lists and hospital and bed closures, is likely only to trivialize the issue and allow professionals to evade their responsibilities to individuals and groups. ...Furthermore, an exclusive focus on rationing diverts attention from another difficult policy problem, which is the need to be much more rigorous in the search for cost effective health care" (p. 811).

While Hunter supports transparency in decision making, he sees the nature of the decision making process to be too complex and too 'messy' an affair to be effectively performed in public. A similar criticism of large explicit rationing exercises is made by Holm (1998), who argues that the principles which are used in these public rationing exercises are necessarily too abstract and imprecise to make difficult rationing decisions.

Supporters of implicit rationing often also support bedside rationing (Hall, 1994; Mechanic, 1995; 1997). They argue that physicians are well placed to make rationing decisions without adding to the anguish and resentment people would have if they knew that they were being denied care solely due to a lack of resources, or what Coast (1997) calls "deprivation disutility" (p. 1118).

Ham (1995) suggests that implicit rationing "is no longer an option" (p. 1484) due to difficulties experts have had in making consistent rationing decisions and the variation in practice patterns which result from these inconsistent decisions. For Ham, the public are wise to the fact that health care rationing occurs on a regular basis. Furthermore, Ham (1996) holds "to argue against public discussion is to run the risk of paternalism of the worst kind" (p. 184).

But the argument between explicit and implicit rationing may not be as all or nothing as it is sometimes presented. Hall (1994) argues that "any sensible rationing system will consist of a mix of the two mechanisms" (p. 316). Likewise, while arguing that there needs to be implicit rationing, Mechanic (1997) says that "explicit decisions have a role in setting the framework" for implicit rationing by physicians (p. 87). Physicians have to be involved in interpreting rationing rules, even if these rules are determined through an explicit and public process. There is also the logistical fact that there are simply too many rationing decisions to make them all through some type of explicit process. The key question rather seems to be how much of the rationing process is going to be made

explicit, rather than whether we should make all rationing decisions through an explicit process or not.

2.3 Factors in Making Resource Allocations

Different factors are often proposed as being relevant to resource allocation decisions. One of the most studied allocation exercises is performed every two years by the state of Oregon to determine the services which will be covered by the state's Medicaid program. The Oregon Health Services Commission (2005) allocates resources based on the factors of expected effectiveness of a health service and the value the community places on the service. Deber's four-screen model (Deber, Narine, Baranek, Sharpe, Duvalko, Zlotnik-Shaul, et al., 1998) considers the factors of ethics, effectiveness, appropriateness, and patient consent. In their study of the views of hospital executives in Ontario, Reeleder et al. (2005) found that hospital executives reported need, quality of care, meeting budgets and fit with strategic plans as the most important factors when allocating resources. Kenny (2002) suggests that there needs to be a clarification of the values underlying our health care system before we move to address questions of what the system should cover or how resources are allocated.

In their survey of resource allocation models, Hurley et al. (2000) identify ten factors which are considered by various models. These factors are accountability, autonomy, effectiveness, efficiency, equity, explicitness of the process, individual responsibility, need, participation, and community perspective. Some of these factors, however, are more concerned with the appropriateness of a patient receiving a particular procedure,

e.g., individual responsibility or autonomy, than a concern with how to allocate resources in a particular area of care. Some of the other factors can be seen to overlap. For example, the concern for participation can be seen to fall under the idea of accountability. This section examines five common factors which seem most relevant to resource allocation within regional health authorities: need, effectiveness, cost, ethical considerations and accountability.

2.3.1 Need

Some decision makers report that need is their most important consideration when allocating health care resources (Reeleder et al., 2005). Nevertheless, defining need is inherently difficult. It is even more problematic to develop a concept of need which can help guide the allocation of health care resources.

The World Health Organization (1946) defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (para. 2). Given this definition of health, any disturbance to well-being could be called a need for care. In his classic overview of medical care management, Donabedian (1973) defines a relevant need for the heath care system as "some disturbance in health and well-being" of the person (p. 62). Donabedian leaves unclear what would count as such a disturbance.[8] While these definitions of need deriving from a disturbance to well-being would cover a great deal, they also seem not to be wide enough. We recognize that the treatments of

[8] Donabedian does latter say that his concept of care "includes situations that cannot be classified as morbidity or mortality but which require care" (p. 70).

risk factors, which do not actually address a disturbance in health but conditions which could eventually lead to some such disturbance, can also be considered as health care needs. In fact, there are many calls for greater focus on treating these risk factors for disease (The Commission on the Future of Health Care in Canada, 2002; Rachlis, 2004).

One problem with this expanded definition of need, which includes risk factors, is that since Health Canada's *A New Perspective on the Health of Canadians* (1974), the scope of these risk factors has expanded to include most of the socio-economic features affecting a person's life (Health Canada, 2005). While it may be valuable in some circumstances to define health and health care need so broadly, such a broad concept is not likely to result in a concept of need that would be of any assistance in making resource allocation decisions, especially within particular areas of care.

Others have tried to define need not in terms of health status, but in terms of a need for health care services. For example, Witter and Ensor (1997) define need as what "a person requires in terms of health care" (para. 1). Expanding on this definition, they go on to say that this concept of need includes both the idea of the availability of care and the capacity of the person to benefit from it. The problem with this definition is that it too is not specific enough with respect to what should be included as a need for health care.

Culyer (1995) says that a concept of need practical enough to help in discussions about resource allocation must meet six conditions: 1) its value-content (which occurs in any concept of need) must be made explicit; 2) it is directly derived from the objectives of the

particular health system it is applied to; 3) it is capable of being used in deciding equity issues; 4) it should be service and person specific; 5) it should have a straight forward link to resources and 6) if acted on as a basis for allocating resources, it should not "produce manifestly inequitable results" (p. 727). Culyer defines a need for health care as "the minimum amount of resources required to exhaust a person's capacity to benefit" (p. 728). It is interesting that Culyer advocates localizing the concept of need to a particular health system. This leaves the door open for variations in what is considered a need depending on the level of resources in the health care system and the health status of the population. In the end, however, Culyer's definition still gives little guidance over which services should be funded based on need. There is a circularity here in that we would be required first to define a set of 'core' services before we could determine a person's capacity to benefit from them. For example, a person would benefit from better housing, but it is unclear whether housing should be considered a health care need. Yet helping to define which services should be covered is exactly what we hope to use this concept of need to do. Culyer also concludes that even granting his concept of need, we are still no further in determining whether we should base the distribution of health care resources in terms of need, capacity to benefit or some concept of equality.

Instead of need, some health legislation talk of "medically necessary" (*Canada Health Act*, 1986) or "reasonable and necessary" care (*U.S. Medicare Act*, 1965). In neither the Canadian nor the American legislation are these terms defined. In the *Canada Health Act*, "medically necessary" refer to services provided in a hospital or by a physician. In the United States, "reasonable and necessary" similarly refers to the services provided by

physicians (Gillick, 2004). But such definitions, based on who provides the care, can result in very counterintuitive accounts of need. As Eddy (1996) points out "an extremely expensive, very low-yield diagnostic test provided in a hospital would apparently be considered essential by this definition (because it is provided in a hospital), whereas a lifesaving antibiotic that could be taken at home would not" (p. 95).

Another attempt to develop a surrogate concept of medical need is the idea of defining a 'basic' or 'core' basket of health care services. We may initially consider essential care as any care which directly contributes to saving someone's life. However the funding of high cost treatments with doubtful chances of success, usually tried only as a last attempt to save someone's life, is one of the main issues in dispute with respect to health resource allocation. Accepting this rule of rescue approach may mean that other treatments and preventive measures which are have a much greater impact on a population's health would not be covered.

Dworkin (2000) and Eddy (1996) both propose variants of what may be called average-citizen-choice concepts of 'basic' or 'essential' care. Dworkin holds that justice only requires that public coverage be extended to the extent fully-informed, prudent people in a fair society, with equal financial resources, would choose to insure themselves for. In his view, justice dictates that we should cover basic and effective medical care and preventative programs, but the core basket of services need not extend to providing care for expensive end-of-life care which has little chance of success. Eddy proposes using citizen juries to poll what services the average person would be willing to purchase. To

account for any variation in income, Eddy proposes expressing costs for coverage in terms of the proportion of a workday an average person would have to work to pay for coverage, rather than in dollar terms. Both Dworkin's and Eddy's concepts have the advantage of considering the element of cost in determining what basic coverage should be. There is some question, however, what the usefulness of any concept of 'basic' or 'essential' care would have for a health care system like Canada's which does not have a substantial private market to provide expanded, or second-tier, medical services.

Another area of concern with the concept of need is that its definition depends a great deal on perspective from which it is judged. Health care involves the encounter of at least two people: a patient and a provider. Both have different concepts of need. Many patients feel they need alternative treatments, even though these treatments have not been shown through research or believed by most physicians to be effective (Aronson, 2002). Direct-to-consumer advertising for pharmaceuticals attempts to make patients believe they have a need for a particular drug. Studies have shown (Mintzes, Barer, Kravitz, Bassett, Lexchin, Kazanjian, et al., 2003) that direct-to-consumer advertising has been successful both at getting patients to request advertised drugs and getting physicians to change their prescription patterns.

Our health care system has, however, long embraced the idea that the recognition of a need should be based on a more objective basis, especially when health needs are to be addressed using public funds. This more objective assessment of need usually includes the assessment of a medical professional. Yet requiring health care providers to

determine a need for medical care is also not without problems. Donabedian (1973) points out that a physician's concept of need "derives from the manner in which medical science defines health and illness and what medical technology has to offer as treatment or prevention" (p. 62). This dependence of need on what the medical sciences have to offer is clearly not how most patients describe or define their health needs. We could perhaps say that providers see need more in terms of the availability of health care services, while patients see need more in terms of disturbance in health, suffering or loss of capabilities. Donabedian (1973) points out that the initiation of medical care requires an agreement between the physician and the patient that medical care is needed. To the extent that this idea could be operationalized, it would entail a definition of need based on what both a health professional and the patient deemed appropriate. Yet within this concept of need, a health care need could only be identified once a person sees a health care professional.

2.3.2 Effectiveness

Health care resources are employed to treat people. If a treatment or diagnostic procedure is not effective, i.e., if it does not result in any health benefits, there is no reason to provide it or to cover it under public insurance plans. Neumann, Rosen and Weinstein (2005) review of U.S. Medicare coverage decisions from 1999 to 2003 found that there has been general consistency in term of considering the strength of evidence for the intervention's effectiveness. Singer et al. (2000) similarly found that effectiveness was the most important factor in determining recommendations for coverage of cancer treatments by Cancer Care Ontario Policy Advisory Committee.

Gold, Siegel, Russell, & Weinstein (1996) define effectiveness as "the extent that they [health services] achieve health improvements in real practice setting" (p. 7). This definition underlies some of the difficulties the criteria of effectiveness raises for resource allocation decisions. The restoration of a person's lost capacity, the alleviation of a person's pain, and the saving of one's life can all be seen as health improvements. A correct diagnosis is key to establishing a proper treatment strategy. Testing a person who feels they are suffering from some ailment can provide a health improvement by lowering his or her level of anxiety, even if it cannot be shown to provide any other measurable effects. Providing a treatment which has no demonstrated medical effect, e.g., Tarantula Hispanica (ground-up tarantula), but which a patient believes is beneficial can likewise relieve anxiety and satisfy the patient.[9] The question is whether we should be concerned with all of these types of health improvements when evaluating a treatment's effectiveness.

Traditionally, determinations of effectiveness have focused primarily on a treatment's efficacy and its safety, i.e., can the treatment be shown to have a beneficial effect in controlled conditions and is it safe? Fuchs and Garber (1990) point out that the meaning of effectiveness has been expanded to include wider considerations such as a patient's quality of life after receiving a treatment, the magnitude of change in a patient's health

[9] For-profit medical institutions have less of a dilemma covering such treatments. If a patient is willing to pay for such treatments, they are increasingly being provided. For example, Beth Israel Medical Center in New York currently offers Tarantula Hispanica to its patients, even though key hospital officials admit to not knowing whether the treatment has any medical effect (Aronson, 2002).

status, comparisons with other available treatment options, and the satisfaction of the patient's treatment preferences. Likewise, Cook and Sackett (1994) say a relevant calculation of effectiveness should include "measures of harm as well as benefit, to integrate patients' views on their quality of life with and without treatment, and to include the economic consequences of the treatment alternatives" (p. 756).[10]

Deber (1992) identifies another two key aspects which need to be included in calculations of effectiveness. The first is the magnitude of the benefit. Treatments can be effective in different ways, from saving someone's life to relieving someone's pain or anxiety. These can be ranked in terms of their level of benefit, usually in terms of some disability index (e.g., Gold, Siegel, Russell, & Weinstein, 1996). We need also to be mindful of the variation in benefits within the types of effects. For example, if two treatments both relieve pain, but one relieves a greater level of pain, then it has a greater magnitude of benefit. This increased benefit is clearly relevant to the determination of the effectiveness of a treatment.

The second aspect Deber (1992) identifies is the probability someone receiving a treatment would benefit from it. As Glassman, Model, Kahan, Jacobson, and Peabody (1997) note, "there are few guaranteed outcomes in medical science" (p. 153). We do not

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[10] Cook and Sackett (1994) go on to say that "but when such analyses have not been done and the only data available are on efficacy, busy clinical readers deserve three sorts of information (complete with their confidence intervals): at least one absolute measure of efficacy (such as the number of patients who would need to be treated to prevent one event), the susceptibility of control patients to the target outcome (as a starting point for extrapolation to their own patients), and (though they could calculate it from the former two) some relative measure of efficacy (such as the relative risk reduction)" (p. 576).

know, for example, before an operation whether it will be a success. We do not know before a diagnostic test is completed whether we will conclusively detect anything. Glassman et al. (1997) suggests this inherent unpredictability of medicine means we need to use "imperfect estimates" of the potential benefit of a treatment (p. 153). This is not to say that we cannot rank treatments in terms of their likelihood to succeed. For example, a straightforward tonsillectomy is more likely to be successful than a complicated heart-and-lung transplant. Still the probability of success needs to be considered in determining its effectiveness. In considering effectiveness, we need to be mindful of the different dimensions of effectiveness: the type of impact, magnitude, and the probability of success.

Hope, Hicks, Reynolds, Crisp and Griffiths (1998) include in their concept of effectiveness the idea of value, by which they mean the judgment on "how valuable that effect is in the relevant individual(s) relative to the value of other treatments" (p. 1067). Essentially, they make explicit the step of evaluating the different types of benefits. Hope and colleagues go on to identify three factors which are relevant to the decisions about the value of a benefit: "the additional length of life that the treatment brings, the contribution that the intervention makes to the patient's well being, and the level of need of those who benefit from the treatment" (p. 1067).

Evidence

Measuring effectiveness requires that there is some agreement on what evidence will be accepted for illustrating types of benefits, their magnitudes and a treatment's probability

of success. Kitson, Harvey and McCormack (1998) identify three sources of evidence relevant to medical practices. These sources are research, clinical expertise (or clinical opinion) and patient choice.

Research findings are often what people have in mind when they think about evidence for effectiveness. This tendency has increased with the advent of evidence-based medicine, which aims to increase the influence of research findings on clinical practice (Sackett et al., 1996). Randomized clinical trials are often seen as the gold standard of research evidence (CHSRF, 2004). These trials are structured so as to compare one group receiving a treatment with a control group who do not. Effectiveness is determined by a comparison of the two groups in terms of some outcome measure. This comparison can give an approximation of the relative benefit of the treatment. One of the key advantages of clinical trials is that they not only indicate whether a treatment is better, but they can give a quantitative estimate of how much better it is likely to be and what is the probability of this benefit (Cook and Sackett, 1995).

The use of clinical trials as evidence for effectiveness is not without its problems. Clinical trials are expensive and are therefore often limited in scope. Effectiveness is only determined against the control group, even though other control groups may be more relevant measure, e.g., those currently taking an alternative treatment versus those only taking a placebo. The effectiveness of a treatment may vary over a population, while clinical trials often only study a subsection of the population. This limitation must be weighed accordingly and often is in making resource allocation decisions. There are

cases in which coverage is only extended to patient populations which resemble the study population of a successful clinical trial, e.g., the U.S. Centers for Medicare and Medicaid Services' 2003 decision to cover lung-volume-reduction surgery only for selected populations (Gillick, 2004). Atkins, Siegel and Slutsky (2005) point to the problems of only relying on a limited number of clinical trials and the problems that have recently arisen in the pharmaceutical industry around not disclosing negative trial results. Results may be inconclusive. There are often ethical or logistic difficulties which make performing clinical trials infeasible. Fuchs and Garber (1990) point to the fact that randomized control trials usually cannot provide all the information needed to determine wider impacts of a treatment. This has led to the use of other types of research beyond that captured by clinical trials, including quantitative studies, qualitative studies, and ethical assessments. Even including these other methods of research, there is still the problem that insufficient evidence exists to properly judge the effectiveness of most treatments, including many new technologies.

The opinions of clinical staff or potential patient populations are usually not as rigorously determined as research studies. This is not to underestimate their importance. Kitson, Harvey & McCormack (1998) note that

> "if an intervention that is found to be highly effective is rejected by clinicians and patients, ...it is unlikely to be widely take-up. Conversely, if clinical experience and patient preference come out in favour of a particular intervention, even though the research evidence is low, then there may be more likelihood of it being adopted or continued" (p. 150).

Clinical staff or a medical advisory group is usually consulted about the effectiveness of treatments being considered for coverage. Patients' views may be judged based on the perceptions of decision makers, the view of an advocacy group, or through some type of survey. There are also varying degrees to which patients may be involved in the decision making process (see Arnstein, 1969).

Health Technology Assessments

Health technology assessments are systematic reviews of the evidence for the effectiveness of a treatment, technology, pharmaceutical, or method of health care delivery (Canadian Agency for Drugs and Technologies in Health, 2006). Not only do health technology assessments cover a wide range of subject matters, there is a good deal of variation in what specific health technology assessments examine and how they are conducted. Battista and Hodge (1999) point out that health technology assessments are more oriented towards policy than other types of health research. Because they are directed towards decision making, they often examine all of the issues which may affect a decision, e.g., patient impact, ethical considerations, as well as assess the safety and effectiveness of the new technology. For this reason, they are often more multidisciplinary in nature than traditional research projects. Fuchs and Garber (1990)

note that the broader scope of assessments can lead to different levels of reliability of the data they are based on.

There are a number of organizations that perform impartial health technology assessments. In Canada, these organizations include the Canadian Agency for Drugs and Technologies in Health, Alberta Heritage Foundation for Medical Research, Conseil d'évaluation des technologies de la santé (Quebec), the Office for Health Technology Assessment (British Columbia) and the Ontario Health Technology Advisory Committee. Internationally, these organizations include the National Institute for Clinical Excellence (UK), the EuroScan (European Union) and the U.S. Agency for Health Care Research and Quality.

While health technology assessments can be useful, there are some shortcomings. Many of these problems are shared with other types of research. Health technology assessments are not always available at the time the information is needed by decision makers. Sometimes the information in the assessments is not relevant to the decision at hand. Assessments are also not always decisive.

Reporting Evidence

How information is collected and critically appraised is important to determinations of effectiveness. Cook and Sackett (1995) hold that another pivotal step in measuring effectiveness is summarizing the data "in terms of measures of effect that can be readily

appreciated by doctors and other carers" (p. 453). We can also include here decision makers involved in making resource allocation decisions.

Cook and Sackett (1995) identify a number of common methods for reporting the relative effectiveness of a treatment. These include 1) absolute risk reduction, which measures the difference in the probabilities of adverse events in the two groups; 2) relative risk, which is calculated by the probability of a positive outcome in the active treatment group divided by the probability of an event in the control group; 3) relative risk reduction, derived by subtracting the relative risk from one; and 4) an odds ratio, which is determined by dividing the odds of a positive event in the treatment group by the odds of a positive event in the control group. Cook and Sackett advocate using the *number needed to treat* as a more meaningful way of to convey the results of research results. The number needed to treat is the number of patients who would have to receive a treatment in order for there to be one positive outcome. It is calculated by taking the reciprocal of absolute risk reduction. Other research groups are exploring alternative means of reporting the strength of evidence which may be more easily grasped by clinicians and decision makers. The Canadian Task Force on Preventive Health Care (2003) now use letter grades to illustrate the strength of evidence for particular procedures or to show if there is insufficient information to make a recommendation. The GRADE Working Group (2004), centered in Norway, are promoting the adoption of a universal system for grading the quality of evidence and the strength of recommendations resulting from scientific literature.

Limitations on the Use of Evidence

Neumann et al.'s (2005) review of recent Medicare decisions identified a number of common problems faced in reviewing the evidence for new treatments. These limitations include concerns about: the limited amount of available research studies of the treatment under consideration (in 68 percent of the cases reviewed); a limited number of patients in the studies presented as evidence (in 58 percent of the cases reviewed); a lack of proper controls on the studies (in 52 percent of the cases reviewed); the relevance of outcomes (in 41 percent of the cases reviewed); select bias in the studies (in 28 percent of the cases reviewed); and, the length of the studies (in 20 percent of the cases reviewed).

There is also a clear trade-off between waiting to get more evidence to be sure of a treatment's effectiveness and unnecessarily denying patients a treatment that is beneficial. Performing a formal technological assessment or clinical trial costs money and adds to the time patients have to wait for new treatments. Fuchs and Garber (1990) point out that many decisions about whether to invest in a treatment need to be determined before sufficient data is available to determine its effectiveness; or it may become a standard practice before sufficient evaluations of the procedure are studied. But great harm can result from interventions being accepted before all the evidence is in. Atkins, Siegel & Slutsky (2005) report that over $2 billion USD was spent and 600 premature deaths occurred because high-dose chemotherapy and bone marrow transplant was not sufficiently evaluated before it became a common practice for fighting advanced breast cancer. The safety and effectiveness of a treatment is rarely ever conclusively proven.

Determinations of effectiveness often must rely then on a consideration of many factors, often without complete information.

2.3.3 Cost

People are often uncomfortable talking about cost as a reason for denying care. Yet it is the issue of limited resources, usually expressed in terms of financial costs, which is the real problem of health resource allocation. It is because financial and human resources are limited that providers need to limit the amount of care they give, rather than just meeting all of the requests for care which present themselves.

Although costs are often expressed in financial terms, there are a range of resources required to provide particular treatments. Using these resources to provide for one treatment means that they cannot be used in the provision of other types of care. Initial capital or equipment costs associated with providing a new treatment need to be considered in calculations of cost. Operating expenses, such as staff costs, supplies used during the procedure, etc, also should be included. Moreover, there are a number of opportunity costs or organizational impacts which should be considered: including the unavailability of expert staff for other procedures, space, booking time in operating rooms and on other equipment, etc. Often these costs are not easily expressed in financial terms, although they may be just as important in making allocation decision and just as limited as financial resources. Future impacts of having treated an ailment can also be considered in cost calculations (Weinstein and Stason, 1977). Other costs may include the impact on the patient and society more generally (Gold, Siegel, Russell, & Weinstein, 1996).

Another important aspect of cost considerations is that individuals, governments and health care organizations have varying exposures to health care costs. The total cost of a disease to a society is not borne equally across the society. In health care systems which have a substantial role for third-party payers, either public or private, people do not directly bear the full cost of the treatments they receive. Usually people pay only part of the cost for their treatment, with an insurance plan covering the rest. In the Canadian health care context, the provincial and federal governments both partially pay for health care. Large providers of care, e.g., hospitals and regional authorities, are usually allocated a global budget to cover the cost of the care they provide. From a cost perspective, such institutions are often focused on how the provision of care directly impacts on their budgets. They may be only secondarily concerned with the impact the provision of care (or lack of provision) has on the wider society. Outside extra funding directed for a specific project will change the calculation of cost from the point of view of a health care provider, even though in absolute terms the cost of providing the care has not changed. For example, if there is a provincial program which provides dedicated funding for the purchase diagnostic equipment, the direct cost of the equipment to a health care provider would be much different than if the provider had to pay the full cost of the equipment from its global operating budget. The same can be said for provincial governments regarding programs of dedicated funding from the federal government. In most cases, it is not total cost of a program, but rather the total cost for them, which is of main concern for patients, insurers, providers, regional authorities and governments.

2.3.4 Ethical Considerations

The above review of some of the key factors impacting on resource allocation decisions has not discussed what weight are given to each of these factors when making allocation decisions. Weighing these factors is a question of what aspects should be given more value. As Ubel (2000) points out, even if it is possible to exactly know the cost and benefits of interventions, we still need to incorporate public values to set health care priorities. Should we aim to maximize the benefits of our investment in health care? Should we direct resources primarily to those in the greatest need? Are there cases when we should favour providing care for a few over giving a lesser benefit to many? Are there personal characteristics, e.g., a patient's age, their level of wealth, their race, or gender which should (or should not) influence the distribution of resources? Should the distribution of health care resources be influenced by wider societal concerns for equality or fairness? Each is a difficult ethical question which may need to be considered when allocating resources. The difficulty of answering them is compounded by the fact that, as Cookson and Dolan (2000) have found in the U.K., the public seem to have conflicting moral intuitions over which of the principles underlying the questions above should guide decisions in different cases.

The ethical concerns about how we allocate resources primarily stem from two sources. The first is from the perspective of distributive or social justice. Rawls (1971) writes that "the primary subject of justice is ...the way in which the major social institutions distribute fundamental rights and duties and determine the division of advantages from social cooperation" (p. 4). As pointed out by Daniels (1984), "a health care system

involves a diverse set of institutions which have a major impact on the level and distribution of our welfare" and thus it is a subject for social justice (p. ix).

Groups are not indifferent to how the health care system is structured. Different health care structures and allocations of resources greatly impact on how the costs and benefits of health care are distributed across different sections of a population. It is also the case that provision of health care can impact other inequalities. From the perspective of social justice, key questions include how the health care system is structured, the mix of private/public funding, the roles and duties of health care providers as well as how health care resources are distributed (Daniels, 1984). Essentially, as a key part of the basic institutions of our society, the health system is the subject to the same concerns for fairness and justice as are all our major social institutions. The distribution of health care is one of the most fundamental ways a society demonstrates how it treats its members.

The second source of ethical considerations stem from the unique benefits brought about by health care. Health care professionals have the power to restore people's lost capabilities or reduce their suffering. The question whether people get health services can, in many cases, even determine whether a person lives or dies. Because of the ultimate importance of health care, how we distribute resources touches on the most fundamental questions of moral worth. Hurley (2001) points out that in most cases illnesses and injuries "are unpredictable and largely beyond the control of the individual" (p. 235). How should this unpredictability of illness affect society's duty to provide care? If a person engages in activities which increase their risk of disease, e.g., smoking, should

this be counted against the person when allocating resources? Which personal characteristics should we take into account when evaluating which group of patients should get coverage? In what way can we deny any treatment to a child with autism, or to any other person in need, and still say that it is both just and fair? Under what conditions can we chose to treat one person and leave another still suffering? These are all difficult ethical choices that are faced when allocating health care.

Daniels (1994) identifies three factors which further complicate the ethical problems relating to health resource allocation. The first is that health care is not 'sufficiently divisible' into small discrete units as, for example, money is. The distribution of health care is more likely to result in unequal or 'lumpy' distributions then could possibly be the case for other types of resources. Consider an expensive operation. It may be the case that not everyone who needs this particular operation is able to get one, but those who do receive a substantial benefit. There is no sensible way to divide the operation such that everyone gets part of the procedure. Those who receive the operations get the full benefit, those who do not get nothing. While we may be able to distribute costs fairly equitably across a population, even if we try to distribute the benefits of health care equally across the society, in many cases, it is likely to still result in substantial variations in benefits because those benefits cannot be divided.

Daniels' second factor is that rationing decisions often occur in cases where even those who are rejected for coverage have legitimate claims that they should receive benefits. In other words, the denial of care is not usually based on a rejection of the rightfulness that a

person should receive care. It is based on other, and perhaps more relevant, criteria. Sadly, legitimate claims for care often exceed providers' capacity to respond.

The third factor Daniels points to is that "the general distributive principles appealed to by claimants as well as by rationers do not by themselves provide adequate reasons for choosing among claimants" (p. 27). There are two distinct aspects to this problem. The first regards the nature of pluralistic societies. In Western industrialized countries, no one philosophical stand point is shared by everyone. In fact, this philosophical, religious and moral pluralism is one of the definition features of liberal democratic societies (Habermas, 1991; Kymlicka, 1999; Rawls, 1993). In terms of allocating health care resources, there is no agreed on philosophical or moral principle to guide moral choices (McKneally et al., 1997). The second aspect of this problem is that, even if there is agreement on a common philosophical position, it is not likely to be specific enough to provide much guidance for making resource allocation decisions. For example, if we take a utilitarian position (Mill, 1963) which says we should aim to maximize happiness across a society, it is still unclear how we should aim to maximize benefits (Daniels, 1994). Given people's varying capacity to benefit from a particular treatment, how one decides this issue can have a substantial effect on how resources are allocated.

Ethical Recommendations

There are two different types of ethical recommendations made regarding resource allocations. The first type is substantive principles which advocate specific patterns of resource allocation. Cookson and Dolan (2000) identify three often proposed principles.

The first is resources be allocated according to need, as defined in terms of current illness and severity of the illness. On this principle, resources would be directed to those who are currently in the most distress, similar to how treatment is allocated in a military triage. The second principle is to allocate resources so as to maximize the benefit of these resources, much in keeping with utilitarian concepts of justice. The third principle embraces egalitarian concepts of justice which aim to use the allocation of health care resources to diminish inequalities, either in health status, life-long health prospects or in terms of socio-economic inequalities more generally. The problem is that there seems to be no consensus for deciding which of these principles should be used in what cases or how to solve disputes when these principles conflict.

Another two substantive ethical claims often made are the appeal to a 'right to health care' and the appeal to 'the rule of rescue." People sometimes claim a right to health care based on the fact that health care is of such fundamental importance that governments have an obligation to provide it to their citizens. By claiming health care as a right, these people assert that the responsibility to provide health care should trump most other government priorities. Daniels (1984) rejects a right to health care. First, he believes the provision of care is not like other right claims, e.g., the right to free speech or free assembly, in that it requires the transfer of resources to individuals. In fact, Daniels denies that claims for health care have the proper nature to be rights claims due to the fact that claims of a right to health care are essential claims on resources.[11] Secondly, Daniels

points out that claiming that there is a right to health care does not determine the limits of health care which may be provided, i.e., it is too vague of a claim. Finally, partly because it is too vague, Daniels claims that the idea of a right to health care is not useful in answering difficult allocation questions.

The rule of rescue is based on the idea that there are cases in which a person is in such dire need that they have even further (or strengthened) claim to scare resources. The rule of rescue holds that society has a moral duty to do all it can to save someone's life. McKie and Richardson (2003) say that people often try to follow the rule of rescue when there are "identifiable individuals facing avoidable death" (p. 2407). The story of Coby Howard, the seven year old boy who died in 1987 while needing a bone marrow transplant which was not covered under Oregon's Mediaid program, placed a great deal of media and political pressure on the state's rationing plan (see Ubel, 2000). Soon after Coby's death, the state began to cover bone marrow transplants. This case illustrates the political and emotional power of the rule of rescue. Yet as McKie and Richardson conclude, the rule of rescue unfairly favours identifiable patients over those who are identified statistically, and favours life-saving treatments over non-life-saving treatments. Ultimately, the rule of rescue often runs counter to the most efficient use of health care resources.

[11] The Supreme Court of Canada has ruled (Gosselin v. Quebec 2002 SCC 84) that citizens to do not have charter rights to social program benefits, although the court has ruled that social benefits that are provided must be provided on an equal basis (e.g., Eldridge v. British Columbia 1997 SSC 3).

The second types of ethical recommendations are procedural, in that they do not make direct claims on how resources should be allocated; rather they aim to ensure the process by which resource allocation decisions are made is fair. Reeleder et al. (2005) reports that decision makers often see fairness in terms of whether multiple stakeholder perspectives were represented. This suggests that a critical mass of public participation is required to ensure the fairness of the process. Daniels (Daniels & Sabin, 1997; Daniels, 2000a; 2000b) has developed a concept of what a fair process would be for allocating healthcare resources, called 'accountability for reasonableness.' Accountability for reasonableness sets out four conditions which should be followed in making resource allocation decisions. The first condition is that decisions are made based on reasons that 'fair-minded' people can agree are relevant given the decision at hand and to decide issues through the greatest possible consensus. The second condition is the decision and the rationale for it should be made publicly accessible. In other words, there needs to be transparency concerning how the decision was made. Daniels' third condition is that there needs to be a mechanism by which decisions can be challenged and revised. The final condition is that the decision is enforceable by the governing body which makes it.

2.3.5 Accountability

In 1998, the then editor of *the New England Journal of Medicine*, Arnold Relman, announced what he saw as a new era of medical care, which he called the era of assessment and accountability. Faced with increasing costs, large variations in the use of health services without noticeable effects on health outcomes, and the expansion in the range of services available, Relman argued that we needed to better assess the value we

are getting for the health care services we buy and that the patients, providers and payers needed to be more accountable for their role in the health care sector.

In Canada, the importance of accountability in health care has increased as the percentage of public spending directed towards health care has increased. The Commission on the Future of Health Care in Canada (2002) found that "Canadians expressed their deep suspicions about the way governments have managed their health care system and where the money goes" (p. 63). This suspicion extended to the fact that, in an area where federal, provincial and regional authorities all have some say, it is often unclear who is responsible for making key decisions (Simeon & Cameron, 2002). The Commission recommended that the *Canada Health Act* be amended to include the principle of accountability. This sixth principle was to: 1) clarify the roles and responsibilities of the different levels of government in health care decisions; 2) ensure adequate, stable and predictable funding; 3) report on how health care funding is spent and 4) report on the performance of the health care system.

Coyte, Zarnett and Mitchell (2004) note that accountability in Canada can be seen either in terms of ensuring that funds go to their intended purpose or in terms of documenting the level of benefit the funds achieve. Coyte, Zarnett and Mitchell further find that recent federal initiatives, directed towards increases accountability, including the increase in joint federal/provincial oversight and an increase in targeted funding, lessen provincial control over health care decision making.

Other countries have turned to national commissions to review coverage as an approach to insure public accountability. These methods have not, however, seemed to restore public confidence in the process. In order to increase its accountability, the U.S. Centers for Medicare and Medicaid Services is moving towards adopting a more structured and explicit decision making process for making its coverage decisions (Neumann et al., 2005). They even release an explanation of their coverage decisions on their website (U.S. Centers for Medicare and Medicaid Services, 2006). Daniels (2000a) points to a number of other efforts to develop fair, publicly acceptable processes for making allocation decisions. These include the active consumer movement in the United States, which advocates the establishment of a patients' bill of rights, and the establishment of the National Institute for Clinical Excellence (NICE) in the U.K.

Singer et al. (2000) identify a number of actions which can help to increase the accountability of the decision making process. These include

> "acknowledging conflicts of interest, providing the opportunity for everyone to express views, ensuring that all committee members understand the deliberations, maintaining honesty, building consensus, ensuring availability of external expert consultation, ensuring appropriate agenda setting, maintaining effective chairing, and ensuring timeliness in making funding decisions to get effective new technologies to patients" (pp. 1317 – 1318).

Singer et al. (2000) also identifies the ability to appeal a decision as key to proper accountability.

Accountability is also about the fairness and openness of the decision making process. Thus accountability is often closely tied to the ideas of public participation and transparency in the decision making process. Awad, Flood and Abelson (2004) argue that accountability is important at all levels of government in the area of health because so many important decisions, especially coverage and resource allocation decisions, are made at the bureaucratic level.

2.4 Approaches for Improving Resource Allocation

A number of approaches for improving health resource allocations have been proposed. These approaches aim to achieve different goals. Some methods aim to improve efficiency. Some proposals aim to make the process of allocating resources more transparent and accountable to the public. Others aim to operationalize key ethical considerations. In this section, I review rational decision models, service guidelines, needs-based capitation models, screen models, cost-effectiveness analysis, program budgeting and marginal analysis (PBMA), accountability for reasonableness, and calls for increased public participation.

2.4.1 Rational Decision Models

Rational decision models aim to determine the decision a pure rational decision maker would make given a particular set of circumstances (Keefer, Kirkwood, & Corner, 2004). In other words, these models determine the optimal outcome for a person or organization with a particular set of preferences facing a particular set of options. Rational decision models come in many forms. Decision trees are the most common example. As with

decision trees, these models usually first identify all the relevant goals the decision maker would like to achieve. The decision maker then rates these goals on a common scale so that a decrease in one of goal can be compared against an increase in another. Then all the possible policy options (or in our case resource allocations) are considered to see which one maximizes the desired outcome.

Advocates of rational decision models argue they can be widely employed in health care, from clinical decision making (Weinstein, Fineberg, Elstein, Frazier, Neuhauser, Neutra, et al., 1980) to the management of health care facilities (Mills, 2005). One of the strengths of these models is that they force the decision maker to be very explicit in the assumptions and the relative value they place on different goals (Deber & Goel, 1990). Rational decision models initially have intuitive appeal. Clearly setting desired goals and determining which allocation best achieves them seems to be a straight forward way to make better resource allocation decisions. These models also hold the promise of clearly identifying one allocation as preferable to all the others in a way that can be communicated to various stakeholders.

The problem with rational decision models is that it is doubtful that they could handle a decision problem as complicated as most resource allocation decisions. Lindblom (1959) criticizes rational decision models, in part, because they are usually unworkable for real world policy decisions. Given all of the different factors involved in most allocation decisions, it would be difficult for an organization to explicitly identify all of the goals it would like to achieve when allocating resources. It would be equally hard to sensibly and

meaningfully convert all of these various goals to a common scale in order to calculate the impact of possible allocations. For example, it is difficult to see how decision makers can compare on a common scale the advantage of say maintaining workplace morale versus improving different areas of care, leading a new research project, or making services more convenient for patients. Another of the criticisms Lindbolm has of these models is that in cases where there are large differences in the types of outcome goals, the act of ranking these goals is the same as deciding on which option to chose, making the decision model irrelevant. In other words, when there is no obvious basis for comparing different goals, we rank these goals only when we make the final decision.

There are also problems with the amount of information, cost and time that are required to construct a large decision model. Decision models have to be applicable for organizations which have limited resources to invest not only in programs, but also limited resources that can be employed for deciding on resource allocations. Given these limited managerial resources, it seems unlikely that decision makers would be amenable or able to conduct a time consuming formal decision analysis of their entire budgetary processes. The rational decision models may be useful for making small, contained allocation decisions, e.g., between a few options within a particular area of care. Beyond this limited use, rational decision models seem unlikely to be helpful in solving resource allocation problems at the institutional level.

2.4.2 Clinical Practice Guidelines

Eddy (1996) defines clinical practice guidelines as sets of recommendations which are "intended to help practicing physicians to manage their patients" (p. 18). The vagueness of this definition stems from the fact that these guidelines can cover any aspect of the clinical experience, from making recommendations about how best to treat a particular condition to what gifts physicians should take from pharmaceutical companies (Bennett & Collins, 2002; McGuaran, 2002). In fact, there are currently around 2500 clinical practice guidelines available for physicians (Worrall, Chaulk & Freake, 1997). Most of these guidelines concern proper treatment options for patients. Regardless of their subject matter, these guidelines all aim to influence physician practices by making recommendations about either how the physician should act or what treatment they should prescribe in a particular situation. This practical focus can make these guidelines quite influential, especially if they are endorsed by leading medical bodies (Eddy, 1996).

Clinical practice guidelines have a number of aims. They were first developed to improve and standardize care by identifying what the current best practices are for treating certain medical conditions (Ubel, 2000). Eddy (1996) points out that many physicians do not have sufficient experience with relatively rare conditions. Usually based on a systematic review of the literature and expert opinion, guidelines are a quick way to provide the physician with a much larger evidence base from which to make their clinical assessment. Guidelines also aim to standardized practice across providers and patients thereby avoiding wide variations in practice patterns (Norheim, 1999).

Clinical guidelines can be used to control health care demand by putting clear limits on which patients should receive particular treatments. Ham (1996) suggests England is increasingly using guidelines as a means of rationing care. New Zealand has also tried to adopt a clinical guidelines approach to rationing.[12] Some of the advantages of using guidelines as a means of rationing are that they do not call for the blanket rejection of any treatment option, but limit care to cases where there it is likely to have the most benefit. Guidelines leave some level of discretion to physicians for determining who falls within the guidelines criteria. Eddy (1996) says that guidelines thus act as "scalpels, not meat axes" (p. 21) in rationing care.

There are a number of issues about the use of clinical guidelines as a means of rationing care. The first is that guidelines have to be developed and maintained to reflect current best practice. This is a time consuming process which often has to be undertaken in the absence of sufficient research evidence (Cooper, 1995; Hadorn, 1990). Another problem is that the use of guidelines to ration care will likely conflict with guidelines which aim to present best practices. Meeting best practices often result in increasing, rather than decreasing, demands for services, especially for high end technology. A third problem relates to the fact that guidelines are only useful if practitioners actually adapt their clinical practice to be in line with them. Ham (1999) suggests that there is a "lack of knowledge of the best ways of influencing and changing clinical practice and implementing research findings" (p. 1484). Similarly, Davis and Taylor-Vaisey (1997) found that clinical practice guidelines show mixed results in their ability to influence

[12] New Zealand's attempt to use clinical guidelines is reviewed in 2.6.2 below.

providers' behavior. There is the issue that as a rationing tool, guidelines are only going to be successful if physicians accept their role as rationers and embrace guidelines as the best way of rationing care (Ubel, 2000).

Giacomini, Cook, Streiner, and Anand (2001) found that 69% of cardiac care guidelines include psychosocial factors in their guideline criteria, either as risk factors or as indication of heighten need. These factors include the patient's work status, attitude, mental health and personal habits. Their inclusion raises the issue that certain value judgments may be uncritically incorporated into clinical guidelines. The fact that these guidelines are explicitly developed does, however, allow for the possibility of public discussion of what psychosocial factors should be considered as relevant, even though currently such discussions rarely occurs. This current lack of public discussion may relate to another problem with guidelines, i.e., why guidelines are often not seen as a legitimate method for denying care. Norheim (1999) suggests that the problem may be that guidelines are developed through a process that neither allows for public participation or is viewed by the public as legitimate. Norhiem says that this leaves the public seeing guidelines as only "instruments for unjustified and covert rationing disguised as expert recommendations" (p. 1426). He suggest that guidelines whose intent is to ration care need to be developed through an explicit process in which the public is informed of the reasons for any limitations on care.

Regardless of their shortcomings, clinical practice guidelines may be applicable to the case studies. This is partly due to their ability to direct various aspects of clinical practice and their ability to limit demand.

2.4.3 Needs-Based Capitation Models

Another proposal for the improvement of resource allocations are capitation models or formula-based funding. Capitation is a method for allocating resources to health regions or service providers based on the population. Often capitation models do not allocate on a straight per-capita basis. Rather, they make allowances to account for differences in health status and variation in the likely usage of health care. These adjustments are often based on variations in age, gender, geographic distribution of population, or other need-influencing criteria across populations (Eyles & Birch, 1993). The aim of making these adjustments is to allow for better health outcomes and more equitable allocations by directing greater resources to those serving populations with greater need.

Using data from Ontario, Bedard, Dorland, Gregory and Rosenberg (1999) evaluated the different distributions resulting from different capitation models: models which use different funding formulas to adjust for the relative needs of the population. They conclude that the way in which models adjust for relative need can have substantial effects on the final distribution. Furthermore, they hold that there is no basis for choosing one particular model over another, except in terms of the desirability of different final distributions. In other words, there is some level of circularity in that it is the desired outcomes which determine the method of weighting the allocation formula.

Capitation models rely on there being some type of regional structure or clear divisions between service providers. The ultimate composition of services provided to a population will depend as much on the regional allocation decisions as it does to the general allocation of resources under the capitation formula. For example, once a region has been allocated its share of resources through the capitation model, it then distributes these resources across the programs based on some form of priority. There is likely to be variation across regions in terms of which programs get funded. These regional allocations may even include transferring funds to other regions to cover things like the provision of tertiary care.

Allocation models are not very applicable for the more focused allocation decisions which are examined in this project. But they are important methods for allocation resources to the health regions in the provinces. In fact, Alberta employs an allocation model which will directly affect the amount of resources available for the three areas of care examined in that province in this study.

2.4.4 Screen Models

Screen models work by setting criteria which must be met in order for a procedure to be approved for public coverage. Each criterion can be seen as a screen or sieve the procedure has to pass through in order to be approved. Only procedures which pass through all the screens are recommended for public coverage.

The Dutch government's *Committee for Choices in Health Care* proposed a screen model as a way of determining which services should be publicly covered. This screen model first removes care deemed unnecessary from the community perspective. The second sieve requires that care be demonstrated to be effective. The third sieve focuses on the efficiency of the treatment. The fourth sieve identifies care that can be left as the financial responsibility of the individual (Van de Ven, 1995).

Another screen model is Deber's four-screen model (Deber et al., 1998). This model begins with a pre-screen to determine whether services are ethically acceptable. If they are ethically acceptable, services are evaluated to determine their level of effectiveness. This evaluation should be conducted through expert review. It may be possible that the evidence is lacking or inconclusive. In these cases, the model gives a conditional pass to the procedure. The second screen examines whether the procedure is appropriate for the individual patient being considered. The last two screens set requirements which services must meet in terms of public acceptance. The third screen asks whether the patient wants and consents to the service, given a consideration of the risks and benefits. The fourth screen asks the public whether the service should be covered under the public plan.

Chart 2.2: Deber's Four Screen Model

Pre-Screen	Is the treatment ethical?
Screen 1	Is the treatment effective?
Screen 2	Is the treatment appropriate for the patient?
Screen3	Does the patient want the service?
Screen 4	Should the public pay for the service?

Deber et al. (1998) hold that this fourth screen of public approval can be broken down into three sub-considerations. The first is cost minimization. Deber et al. says that "[t]his criterion is not equivalent to determinations of cost-effectiveness, because it makes no effort to determine whether a particular benefit is worth purchasing; rather, it presents the far weaker requirement that any benefit purchased (of a specified level of quality, timeliness, etc.) be obtained at the lowest possible cost" (p. 523). The second sub-considerations address social values. The question posed is "are we, as a society, willing for people to be denied this particular treatment because of its cost?" Finally, Deber and colleagues consider the advancement of medical knowledge in determining whether the public should paid for a particular treatment.

Screen models aim to organize the key factors which should be considered in making public coverage decisions. One of the problems with screen models is that they do not easily allow for the prioritizing of services once they have passed the screens. These models examine services on a one-by-one basis to determine whether a service should be covered by a public program. But decision makers often face the situation where too many procedures are determined as acceptable for public coverage. The problem of resource allocation is that there are often many options, all of which have merit, but for which there are only enough resources to implement one. This is usually where most of the hard choices regarding resource allocations lie: in determining which ethical, effective, appropriate, and desired program actually will receive funding. Deber et al. (1998) suggest that this problem can be addressed by adjusting the public expectations screen of their model by having providers and patients make "microallocations" (p. 526).

But this seems to undercut the usefulness of the screen model for making difficult choice because it leaves the decision to providers and patients to decide without giving any guidance to them. Likewise, screen models are not well suited for dealing with the incremental nature of most requests for increased resources. While useful for making coverage decisions, screen models do not seem able to offer much assistance with many allocation problems, e.g., making budgetary decisions.

There are other difficulties with Deber's four-screen model. The second screen examines whether the treatment is appropriate for particular patients. Unless appropriateness is going to be determined by practice guidelines, this screen seems to leave the door open for some type of bedside rationing, in that physicians and frontline health care workers would determine whether a treatment is publicly covered or not. In terms of order, making the second screen appropriateness also seems to create problems, given that this screen can only be passed once the patient is presented to the health care provider. It is not logical to say that this should precede the public's deliberation over whether the treatment should be publicly covered or not (Hurely et al., 2000). Deber's model also does not determine how the public's views are to be measured.

2.4.5 Cost-Effectiveness Analysis

Economic evaluations of interventions only began in the 1960s with cost-benefit analysis in the area of public health. Economists would first calculate the cost of a particular illness on a society in monetary terms. Cost-benefit analysis would use this 'cost of illness' value and compare it with the cost of an immunization or public health program.

Weinstein (Buerhaus, 1998) says that sensitivities about expressing health benefits in monetary terms lead to the development of cost-effectiveness analysis. In cost-effectiveness analysis, health outcomes are measured in some type of health unit, usually based on some index of quality-adjusted-life-years, and the costs of different interventions are measured in dollars. Cost-effectiveness analysis produces a measure of the relative value for interventions in terms of their cost for producing a particular amount of health improvement.

The ultimate success in comparing two treatments in terms of both their cost and effectiveness is when one treatment is shown to be both less expensive and provides at least the same amount of benefit. In such cases, one treatment can be said to be more efficient. When this is not the case, or when calculations compare programs which do not easily allow for comparison, allocative efficiency should be the goal (Donaldson, Currie & Mitton, 2002). In other words, the goal should be to determine an allocation which maximizes the benefits (however, benefits are defined) from a particular investment of resources.

Both Deber (1992) and Donaldson at el. (2002) divide treatment comparisons into a number of possible options, based on the possible outcomes regarding cost and effectiveness. *Table 2.3* reconstructs their tables.

Table 2.3: Matrix of Levels of Cost and Effectiveness

	Increased Effectiveness	**No Change**	**Decreased Effectiveness**
Lower Cost	YES	YES	HARD CHOICE
Equal Cost	YES	INDIFFERENT	NO
Higher Cost	HARD CHOICE	NO	NO

By determining the cost and the effectiveness of treatments, it is possible to clarify where a decision is on this table and whether the decision is relatively easy to make. Some choices are relatively easy. Hard choices for decision makers are those in which positive outcomes regarding cost and effectiveness conflict, e.g., when there is increased effectiveness but higher costs or when there is lower costs but with decreased effectiveness.

This table has, however, a number of limitations. The first is that it does not give any guidance in settling these hard choice decisions beyond identifying them as hard choices. Secondly, it cannot be used to easily compare choices between services treating different diseases; or when measures of effectiveness are not easily comparable. While this table is useful in that it conceptualizes where some of the difficulties lie, there are more powerful techniques which are better at making comparisons across different types of health care interventions and the types of benefits which arises from them.

Weinstein and Stason (1977) say that cost-effectiveness analysis provides "a rational framework for decision making" which incorporates information about a treatment's efficacy, preferences of patients between present and future health benefits, preferences

about quality of life, longevity of life and cost (p. 717). Cost-effectiveness analysis reduces all of this information down to a cost-effectiveness ratio. Cost-effectiveness analysis allows then for comparisons between difficult cases, e.g., across different types of services and across different types of beneficial health outcomes.

The nominator of a cost-effectiveness ratio is the cost of providing the intervention. Weinstein and Stason (1977) propose that the following be included in calculations of net health care costs: 1) all direct medical costs, including the cost of hospitalization, physician services, medications, laboratory and other services; 2) all costs associated with adverse side effects of treatments; 3) savings resulting from the treatment of the disease and 4) "the costs of treating diseases that would not have occurred if the patient had not lived longer as a result of the original treatment" (p. 718). This calculation of cost is done from the societal or total cost perspective. That cost-effectiveness be determined from the societal prospective was one of the recommendations of the U.S. Panel on Cost-Effectiveness in Health and Medicine (Russell, Gold, Siegel, Daniels, & Weinstein, 1996). Weinstein and Stason recognize that different groups, e.g., patients, insurers, providers, have different concerns relating to their exposure to cost. They claim that other groups can adjust these costs to their own cost exposures by tailoring the formula for calculating cost to their own perspective.

The net health benefit is the dominator of the cost-effectiveness ratio. In order to capture not only the amount of time a person may add to their life through a particular intervention, but also improvements in their quality of life, some type of quality-adjusted-

life-year calculation is made. QALY measures attempt to fairly account for the improved health state of the patient by adjusting the value of the number of years the patient survives according to the degree of health improvement resulting from the treatment (Edgar, Salek, Shickle, & Cohen, 1999). The basic idea is that the benefits of different treatments are translated into a common measure. Although there are variations in how these calculations are made, all of them use a subjective scale to weight different health states. This weighting scale is developed based on some type of patient or public survey. The scale is then multiplied by the average gain in longevity from the treatment to determine the net health benefit. Cost-effectiveness models then usually discount the value of future health benefits as compared to more immediate health benefits. The U.S. Panel on Cost-Effectiveness in Health and Medicine also recommend running sensitivity analysis by varying key factors to improve the strength of the cost-effectiveness models (Russell et al., 1996).

Cost-effectiveness analysis is not without its detractors and problems. Weinstein (1998) reports that cost-effectiveness analysis generally has more impact on fields such as pharmaceuticals and prevention programs than in primary care, surgery or diagnostic testing. Weinstein reports that diagnostic testing is particularly difficult for cost-effectiveness analysis due to complexities around accurately estimating the real benefit, e.g., determining the role of the tests on future treatment success. Other problems associated with cost-effectiveness analysis include the problem of getting reliable data on effectiveness. Donaldson et al. (2002) found difficulties in ensuring all factors are taken account of in the calculations. There is also a problem with time horizons. Research

trials have a specific cut-off time. Cost-effectiveness analysis is calculated over the life of the patient. This leads to the invariable problem of estimating the effect of a treatment beyond the point for which there is any reliable data.

There are a number of problems associated with equating all conditions to a quality-of-life scale. The value people place on different health states vary depending on whether one is asking people with the disease, populations at risk for the disease or the general population (Ubel, 2000). Who is surveyed to establish the scale will greatly affect the quality-of-life-measures which are used. Another set of concerns relate to what cost-effectiveness analysis leave out, e.g., concerns about equity. Ubel, DeKay, Baron and Asch (1996) have shown that even many experts in medical decision making, those who perform cost-effectiveness analysis, are willing to over look cost-effectiveness when it conflicts with equity of care.

These problems notwithstanding, Weinstein and Stason (1977) claim that it is still better to use some model for allocating resources than none at all. Weinstein and Stason also suggest that the intent of cost-effectiveness analysis is often misconstrued. For them, cost-effectiveness analysis is not a deterministic test or a procedure for neatly deciding which treatments to fund and which not to fund. Weinstein says "cost-effectiveness analysis is meant to be informative, helpful, and to provide another perspective on a decision. But it is not meant to determine the decision" (quoted in Buerhaus, 1998, p. 226).

There are various ways in which the results of a cost-effectiveness analysis can be used in allocating resources. Weinstein and Stason (1977) suggest that services can be ranked in terms of cost-effectiveness and that starting at the top of the list, services are funded until the financial resources are exhausted. This would be similar to how Oregon initially tried to prioritize Medicare services. One area where cost-effectiveness analysis does seem to have a real impact is on the development of screening programs. For example, in a study for the Blue Cross Association, Eddy (1990) showed that there was a steep deterioration in the cost-effectiveness if Pap smears are performed more often than once every three years. Eddy's conclusion led Blue Cross to only cover Pap smears once every three years. For all its shortcomings, cost-effectiveness analysis forces people to be explicit about the beliefs, values and assumptions when they are making allocation decisions.

But not all resource allocations can be clarified by cost-effectiveness analysis. On many occasions resource decisions are not primarily concerned with which option will have the greatest impact on patients for the least cost. Often types of resource allocations are concerned more with the impact on the organization rather than on the patient population. It is also hard to see how many of the relevant factors for resource allocation can be incorporated into a cost-effectiveness analysis. For example, it is unclear how the risk of a department losing its teaching accreditation, staff morale, the benefits of doing research, can be included. There are a number of other problems with using cost-effectiveness analysis. As stated above, published cost-effectiveness analyses are usually presented from the societal or total cost perspective. The idea is that other users, e.g., individual health care institutions, can adjust these studies to their own perspective. This is often

easier said than done. Many health care institutions simply lack the familiarity and expertise with cost-effectiveness to utilize it into their decision making process (Prosser, Koplan, Neuman, Weinstein, 2000). These institutions also often feel that relevant cost-effectiveness data is rarely available when they need it to evaluate a new service or technology (Prosser et al., 2000). Some even question whether the very nature of cost-effectiveness is an appropriate decision tool at the institutional level (Langley, 2000). While cost-effectiveness may be able to contribute to particular allocation decisions, it is likely that there are many allocation decisions to which it cannot contribute.

2.4.6 Program Budgeting and Marginal Analysis (PBMA)

Program budgeting is commonly used as a means of capping funding in particular areas of care. The basic idea is that regional authorities allocate each clinical or program area a funding envelope. It leaves many of the decisions about how best to use that money to the doctors and managers working within these areas, who are often in the best position to decide priorities. Before clinicians in an area can ask for an increase in funding, they are supposed to examine their current expenditures to see if there are services which can be cut, reduced or resources 'released' from their current use. It is the release of resources from lower priority areas to be used in higher priority ones which is the key to the efficiency gains expected from this approach. Mitton and Donaldson (2004) point out that resources released can come through operational efficiency gains, service reductions or disinvestments.

Program budgeting and marginal analysis can be applied in individual programs of care, across a set of programs within the same general service area, or more broadly, across major service areas (Mitton and Donaldson, 2004). To do this, decision makers need to identify the marginal benefit of the resources used. In other words, the overall program is not evaluated. Rather what is evaluated is the incremental benefit of the last amount of the resources directed to a program. This follows the standard approach of marginal analysis found in economics. As Fuchs (1974) explains:

> "In principle, the solution is to be found by applying the economist's rule of 'equality at the margin.' This means relating the incremental yield of any particular program to the incremental cost of the program and then allocating resources so that the yield per dollar of additional input is the same in all programs. ...Note that decisions about expanding or contracting particular programs should be based on their respective marginal benefits, not their average benefits" (p. 20).

By comparing the marginal benefits between programs, decisions can be made as to whether the relative sizes of each of the envelopes should be changed. Conceptually, the focus is on the benefit gained from the last dollar spent on a program. The level of benefit gained for using this last dollar spent in this program is then compared with the benefit which could be gained if the funds were used for other programs, i.e., its opportunity cost. In marginal analysis, the optimal allocation of resources is one for which no incremental gains could be realized by shifting resources to another program. Economists would describe this optimal allocation as a situation in which the marginal benefit of all programs equal their opportunity costs.

Mitton and Donaldson (2004) have shown how this approach can be employed within a health care institution. They propose that much of the work of identifying new spending priorities and areas for resource release be carried out by an advisory panel. This advisory panel should have representatives of the various stakeholder groups. Who these stakeholders are depends on the scope of the priority setting exercise. Once the panel is established, it then needs to develop a set of decision making criteria. These criteria should be weighted if at all possible to reflect preferences between different goals. Once the decision criteria have been identified, a priority list can be developed by explicitly rating the services under consideration. Lower scoring priorities would then reallocate some of their resources to higher priorities until no more gain can result by reallocating resources.

Mitton and Donaldson's approach does have a number of strengths. First, it builds upon the institutional structure of most health care institutions. Many health care institutions already use some form of program budgeting. Second, it has the flexibility to be used either within programs or across an entire organization. Third, it forces programs to compete against each other to ensure that resources are used as efficiently as possible.

There are also some shortcomings with this approach, many of which are shared by other decision tools. Decision criteria may be hard to agree on and weigh. In their survey of resource allocation models, Hurley et al. (2000) identify ten recurring factors which proposed resource allocation models generally use. While decision makers often report these factors as relevant, there are a number of other factors, such as geographic

disbursement of services, maintaining accreditation, even issues of space within an institution, which often are crucial to how allocation decisions are made. It is hard to see how all these relevant factors could be accounted for in an *a priori* list of decision criteria. Another problem is that health care may not be a very suitable candidate for marginal analysis. Daniels (1994) points out that health care is not sufficiently divisible. The distribution of health care is more likely to result in unequal or 'lumpy' distributions then could possibly be the case for other types of resources, e.g., money. Many program areas do not allow for partial funding. Large capital purchases, for example, the purchase of a new MRI scanner, likewise may not easily allow for marginal analysis and proportional transfers to funds because the purchase may require the commitment of almost all of a health organization annual capital budget. Regardless of its shortcomings, the basic PBMA approach may be promising for assisting in the type of resource allocation decisions which we are likely to encounter in the case studies.

2.4.7 Accountability for Reasonableness

Daniels has developed a concept of a fair process for allocating health care resources (Daniels & Sabin, 1997; Daniels, 2000a; 2000b). This approach, which he calls accountability for reasonableness, is based on setting out the conditions needed for an ethically defendable allocation process. There are four conditions. The first is that decisions are made based on reasons that fair-minded people can agree are relevant given the decision at hand. What reasons are relevant depend on the particular case being considered, although some of the factors identified in section 2.4 below would certainly be relevant to most allocation decisions. The second condition is the decision and the

rationale for it should be made publicly accessible. In other words, there needs to be transparency concerning how and why decisions are made. The third condition is that there must be a mechanism by which decisions can be challenged and revised. The final condition is that the decision is enforceable by the governing body which makes it. For Daniels, any allocation process which meets these four criteria can be considered fair.

One of the strengths of Daniels' approach is that it operationalizes the ethical conditions which should be followed in justly allocating resources. Martin, Singer and others associated with the University of Toronto Joint Centre for Bioethics have begun to use accountability for reasonableness as a framework for evaluating resource allocation decisions and to recommend improvements to decision making processes. Recognizing that fairness is an important goal of any allocation decision, this group evaluates priority setting exercises in terms of whether they meet Daniel's four conditions. Gaps in an organization's accordance with either of the conditions indicate areas where there can be improvement in their decision making process. Through a series of studies, this group has applied the accountability for reasonableness framework to study the views of hospital executives about the level of fairness in their institutions (Reeleder et al., 2005); decision-making in the SARS crisis (Bell et al., 2004); priority setting in hospitals and regional authorities (Gibson, Martin and Singer, 2004) and in hospital strategic planning (Marin et al., 2003). Ham (1999) has also used accountability for reasonableness as a framework for evaluating the fairness of allocation processes in the United Kingdom.

Accountability for reasonableness is a valuable tool for incorporating ethical considerations into the allocation process. Daniels' four conditions are flexible enough to be employed in most decision making situations. For example, it seems likely that accountability for reasonableness can be employed in the case studies. The shortcoming is that accountability for reasonableness is not sufficient on its own to settle every allocation problem. Although it helps to ensure that the process is fair, it is unclear how accountability for reasonableness by itself can either provide a clearer picture of the options under consideration or help determine priorities in a way which increases efficiency. At best, accountability for reasonableness can be a partial solution to most allocation dilemmas.

2.4.8 Public Participation

Calls for increased public participation in the allocation of health care resources come from many different sources. Public participation is seen to increase the accountability and transparency of the allocation process (Canadian HIV AIDS Policy Law Review, 2003). It accords with democratic ideals of citizen participation in decision making (Abelson & Eyles, 2002). It is argued that public participation may lead to better allocation decisions (Coast, 1997). Ham (1996) sums up the feeling of many when he writes,

> "decisions on priorities for communities and whole populations involve value judgments that are too important to be left to professionals. It is all the more important, therefore, that these decisions involve as wide a set of interests as possible. The outcome may not always satisfy the experts, but this is always a risk in a democratic process" (p. 184).

Essentially, a great deal of health care is delivered through public programs and the public have "a legitimate and useful role to play" in determining what these programs should and should not provide (Chafe et al., 2007, p. 1).

Public participation in health care is a complicated topic. It is beyond the scope of this project to review all of the issues relating to public involvement in health care decision making. One of the products of the Basket Grant project is a framework for assisting decision makers to engage the public about resource allocation decisions (Chafe et al., 2007). This framework reviews many of the difficult issues related to involving the public in resource allocation decisions. One of its observations is that public participation is never easy and often times it can be impractical. The framework also concludes that the decision making organization must provide commitment and resources to support public participation.

2.4.9 Review of Decision Approaches

One of the goals of this project is to consider the likelihood that approaches proposed in the academic literature for improving resource allocation would be useful for improving decision making in the selected cases. To help evaluate the likelihood of the proposed approaches being applicable, *Table 2.4* summarizes some of the information about the different approaches in terms of their aims, conditions, strengths, and weaknesses. The table also summarizes any conclusions which can be made about the different approaches. Based on this review, it appears that clinical practice guidelines, cost-effectiveness

analysis, PBMA, accountability for reasonableness, and public participation are most likely to be applicable to the cases under study in this research project.

Table 2.4: Overview of Decision Approaches

	Goals	Conditions	Strengths	Weaknesses	Comments
Rational Decision Models	Maximize outcome preferences	Identify and weigh outcome preferences	Explicit in desired outcomes	Difficulty weighing preferences; Requires a great deal of time and information	Useful only for small allocation exercises
Clinical Practice Guidelines	Identifies best practices; Standardize practice; Limits health care usage	Develop and maintain guidelines; Physician acceptance	Limits care; maximize benefit; No basket rejection.	Labour intensive; open to unseen value bias.	Maybe applicable to case studies
Needs-Based Models	Allocates resources fairly and efficiently	Develop funding formula; population data	Can improve the efficiency and fairness of allocations	Formula often determined by desired outcome	Not practical for program allocations, but may be useful for more general allocations of resources
Screen Models	Ensure coverage meet specified criteria	Data about criteria	Organizes required criteria	Cannot prioritized; incremental resource requests	Most useful for making coverage decisions
Cost-Effectiveness Analysis	Compare treatment options	Effectiveness and cost data; Public QALY data	Provides the relative worth of a treatment	Unfamiliar to many decision makers; data requirements	Limited application
PBMA	Maximize efficiency	Data about criteria and decision maker preferences	Increases efficiency; uses existing health care structure	Information; difficulty weighing preferences	Maybe applicable to case studies
Accountability for Reasonableness	Operationalizes ethical considerations; accountability	Set criteria on the process for allocating resources	Operationalizes fairness considerations	Not sufficient to determined allocations	Maybe applicable to case studies
Public Participation	Accountability; Accords with democratic ideals	Commitment and resources from the decision making organization	Accords with democratic ideals; May improve decisions	Some times impractical; Unable to meet expectations	Maybe applicable to case studies

2.5 Areas of Care – Case Studies

As stated in the introduction, three areas of care - endovascular coiling, MRI and powered upper arm prostheses - were chosen for this study, in part, because they represent a diverse set of health services. This section briefly describes each area of care and includes considerations such as impact, demonstrated effectiveness, estimated cost per procedure, and estimated patient population.

2.5.1 Endovascular Coiling

Endovascular coiling, sometimes called endovascular neuro-coiling or embolization, was started in the early 1980's by Dr. Guido Guglielmi as a new treatment option for cerebral aneurysms. An aneurysm is a bulging of the artery. Aneurysms are most often found along the aorta or in the brain, although renal aneurysms also occur. The most common type of aneurysm is a saccular or "berry" aneurysm. As illustrated in *Figure 2.1*, this type of aneurysm has a neck and usually occurs at points where arteries diverge. Fusiform aneurysms, in which there is bulging on both sides of the artery, are less common. Aneurysms are also often classified in terms of their size, shape and specific location.

Figure 2.1: Types of Aneurysms[13]

[13] The images are from Brain Aneurysms Foundation (2005).

An important class of aneurysms is cerebral, or intracranial, which occur in the brain. As with other types of unruptured aneurysms, such cerebral aneurysms may show no symptoms. If the aneurysm is large enough, it may cause headaches. In severe cases, large cerebral aneurysms may cause stroke-like symptoms, such as problems with vision, memory, speech, weakness in limbs, or seizures.

The main concern with unruptured aneurysms is the risk they pose for breakage or leakage. A ruptured aneurysm results in cerebral hemorrhaging, which is a very serious medical problem. Higashida (2003) reports that between 30% to 40% of patients who suffer a ruptured aneurysm will die. The Department of Neuroradiology at John Hopkins University Hospital (2005) estimates 50% mortality. Another 20% to 35% of patients will have moderate to severe brain damage. Given that the more bleeding there is, the greater risk there is for the patient, immediate medical care is required for a ruptured aneurysm. Cerebral hemorrhaging may result in vasospasm, a narrowing of blood vessels in the brain which can result in further brain damage; or hydrocephalus, an increase in cerebrospinal fluid which puts increased pressure on the brain. Ruptured cerebral aneurysms can also cause hemorrhagic strokes.

Cerebral aneurysms can occur in all age groups, but the incidence rate increases steadily with age. The main risk factors include smoking, previous head injury, and a family history of aneurysms. The Brain Aneurysms Foundation (2005), a U.S. based not-for-profit support group for victims of ruptured or unruptured aneurysms, estimates three

million Americans have at least one cerebral aneurysm. Higashida (2003) estimates a similar prevalence rate, with between 0.5 to 3.0% of these people actually suffering a cerebral hemorrhage at some point in their lives. The percentage of these which require serious medical attention is much lower.

If an aneurysm can be detected prior to rupture, the patient's prognosis is greatly improved. A major rupture is often preceded by a warning leak, which manifests itself as an uncharacteristic painful headache. An aneurysm may also be detected prior to rupture due to pressure on surrounding nerves or inadvertently through diagnostic tests taken for some other reason, e.g., during a magnetic resonance imaging (MRI) or magnetic resonance angiography (MRA) on the head.

There are currently several treatment options for both ruptured and unruptured cerebral aneurysms. For small aneurysms, medical therapies, such as smoking cessation and blood pressure control, may be sufficient. In some cases, it may be best to stop blood flow through the entire artery leading to the aneurysm or to bypass the artery using an artery from another part of the body. This is called an occlusion and bypass. Another method for treating serious ruptured and unruptured aneurysms is microsurgical clipping. Clipping is a procedure in which the aneurysm is clipped shut, using a device similar to a small clothes pin. The clip stops blood flow to the aneurysm thereby removing the risk of rupture or stopping any leakage if the aneurysm has already ruptured. This procedure requires open brain surgery.

Endovascular coiling is a procedure in which the aneurysm is filled with platinum coils, thereby blocking the flow of blood to the aneurysm. Endovascular means that the procedure is preformed inside the vascular system. The procedure uses a catheter inserted in an artery, usually around the groin area, which is led through the vascular system to the aneurysm. This catheter packs the aneurysms with thin platinum coils which are then released from the catheter using a small electric charge. These coils are often called Guglielmi Detachable Coils (GDC). Although other materials can be used, the softness of platinum allows the coils to assume the shape of often irregularly shaped aneurysms while posing little threat of rupture. The procedure is illustrated in *Figure 2.2.*

1 2 3

Figure 2.2: Endovascular Coiling Procedure[14]

The University of Toronto's Brain Vascular Malformation Study Group (2005) reports sometimes a mesh stent is used if the neck of an aneurysm is too wide to ensure the coils

[14] The images are from Brain Aneurysms Foundation (2005).

stay within the aneurysm. The length of surgery varies according to the complexity of the case. Generally, the procedure takes approximately two hours. Most individuals recover rapidly and are released within a couple of days.

Endovascular coiling is less invasive than clipping in that it does not require open brain surgery. The procedure may be performed under general anesthesia or with a local anesthetic. Because of advanced age, serious medical problems or other factors, some people may not be able to undergo open brain surgery. For these patients, endovascular coiling may be their only treatment option. The decision whether to clip or to coil a dangerous aneurysm depends on the size, shape and location of the aneurysm; the condition of the patient; and the patient's wishes.

Research

To date, there is little research on the effectiveness of endovascular coiling. The only major randomized control trail, the International Subarachnoid Aneurysm Trial (ISAT), is still ongoing. Its preliminary findings (see Molyneux, Kerr, Stratton, Sandercock, Clarke, Shrimpton, Holman, et al., 2002) are that endovascular coiling is slightly less risky than clipping. The trail has so far only examined patients one year after the procedure and only patients who have ruptured aneurysms. Based on a retrospective analysis, Johnson (2000) found that endovascular coiling is associated with decreased risk of negative outcomes, shorter hospital stays and shorter recovery times. The long-term durability of coiling, however, is still unknown. Some concerns have been expressed about the complications coils could present to any future brain surgery (Brain Aneurysms

Foundation, 2005). Broderick (2000) argues that more research is required to support the long-term safety and superiority of endovascular coiling.

Regardless of the lack of sufficient research, endovascular coiling has become fairly established as an acceptable method of treating cerebral aneurysms. The University of Toronto's Brain Vascular Malformation Study Group (2005) reports that 125,000 procedures have already been preformed world wide. Interviews conducted as part of this project found that not one radiologist, interventionalist radiologist, or neurosurgeon questioned the effectiveness of coiling.

Resource Requirements

There are two main capital costs involved with the procedure. Endovascular coiling requires a special-type angiography suite.[15] General Electric is a leading supplier of these biplane angiographies. General Electric also produces computer software that removes distortion and which can even specifically monitor either neuro-coils or clips. A biplane angiography machine can cost around $3 million, but can also be used for other procedures.

Coils are available in different lengths, diameters and with different characteristics. Because of the emergency nature of the procedure, health care providers are required to maintain an inventory of coils. An initial inventory of coils can cost around $250,000. Boston Scientific (U.S.) and Cook Inc. (U.S.) are the two leading suppliers of GDC-

[15] Angiography takes X-rays of the arteries and veins to diagnosis problems in the vascular system.

platinum coils. The coils of both companies are approved for use by Health Canada, the Food and Drug Administration (U.S.) and the Interventional Procedures Advisory Committee (U.K.).

Operational costs average around $10,000 per case, which includes the cost of coils, catheters, wires, stents, and other necessary materials. The platinum coils themselves can cost between $4200 to $7000 per procedure. There are advances in the types of coils available, which may increase the future cost of coils. Estimates varied in terms of the expected patient population from between 1 to 10 cases per 100,000 annually.

The procedure requires two radiologists, an anesthesiologist, two nurses and a technologist. Neurosurgical back-up team must also be available, although their cost is not usually included in cost calculations of the procedure.

2.5.2 MRI

MRI scans are machines which perform non-invasive diagnostic tests. The first MRI scan was installed in 1983 at the University of Manchester (U.K.). Since then, MRI scans have quickly become one of the most valuable diagnostic tools for internal examinations.

Magnetic resonance imaging is possible because of a peculiar way atoms react to magnetism. The peculiar effect is that when magnetized, the nuclei can be made to release energy in terms of faint radio waves. Clinical MRI scans work on the hydrogen atoms in the body. Hydrogen atoms in different types of tissue produce waves at slightly

different frequencies. The MRI scanner works by first using a powerful magnet to align the nuclei of some atoms. The machine then hits these nuclei with radio waves to agitate them from their alignment to the magnet. When the nuclei return to their alignment, they release energy also in the form of radio waves. The MRI machine records these radio waves. A computer is then used to determine the position of the different atoms and generate an image of the inside of the body based on their various positions.

Unlike tradition x-rays or computed tomography (CT) scans, MRIs do not use x-rays. Because of the strength of the magnet, there are some risks for patients with metal implanted in their body. For example, people with cardiac pacemakers or clips for cerebral aneurysms cannot receive MRIs. With the exception of these groups, MRIs are considered fairly safe.

The rapid spread of MRI technology is due to its non-invasiveness, the type of images it can produce, and its wide range of applications. MRIs can clearly show soft-tissue and can produce any imaging plane. In other words, an MRI can produce an image of any slice of the body. It can also capture some functional information, include brain function. As illustrated in *Figure 2.4*, MRIs can provide fairly detailed images of internal organs.

Figure 2.4: MRI Scan of a Head[16]

MRI scans are constantly being improved and applied to new diseases. The Mayo Clinic (2007) says MRI scans can be used for examinations of the brain, neck, spinal cord, organs and soft tissues. They also say that MRI scans can helps diagnose central nervous system disorders, brain tumors, strokes, brain abnormalities in people with dementia, diseases of the pituitary gland, eye or inner ear tissue abnormalities, damage caused by heart attack or heart disease, detect blood vessel blockages, bone and joint infections, injuries, degenerative disorders, bone and joint damage, breast cancer and functional disorders in the lungs, liver, pancreas, kidney and spleen.

Further applications of MRI are currently being assessed. MRIs produce three dimensional images. MR angiography suites are now available. MRI scans are using

[16] The image is from Wikipedia (2007).

stronger magnets which provide more detailed images and reduce scanning time. Machines are also being developed which are more patient friendly.

One of the issues relating to resource allocation relates to the fact that MRI and Computed tomography (CT) are both still developing technologies. Each new machine come out with ever greater capabilities which can then be used for a wider range of tests. As one participant is this study said,

> "so we may just sort of level out on the current technology and its application and, all of a sudden, we've gone from a 4-slice to a 64-slice CT, which can now do work that previously was done in the angiography suite for cardiology. So now there's an entire new layer of tests. So until the technology matures, we're going to be chasing after this target wait time for some time here because it continually... we're not dealing with a stable demand."

In 2003, the last year for which there is StatsCan data, 892,000 Canadians over the age of 15 had a non-emergency MRI performed. This represents 3.4% of the Canadian adult population. As the technology develops and becomes more established, usage patterns have changed. CIHI (2006) reports that about 35% of non-emergency MRI scans are now for joint and fracture cases. They also report a greater number of MRI scans are performed now on a case by case basis.

It is fair to say that the MRI scans have a high public profile. This is especially true given that they are pieces of technical radiological equipment. Politicians commonly debate about them. The newspapers give them, and the wait times for them, front page coverage without having to explain what they are. Some provinces, e.g., Alberta and

Saskatchewan, post wait times for non-emergencies on their websites. The Fraser Institute (See Esmail & Walker, 2005) also offer annual report of wait times for key procedures, including MRI machines.

During the 2003 First Ministers First Ministers' Accord on Health Care Renewal, First Ministers established a Diagnostic/Medical Equipment Fund. The fund directed $1.5 billion for diagnostic equipment and staff training. This money was to help address perceived shortages of MRI machines and decrease the wait lists for MRIs. First Ministers also agreed "to report to their citizens on an annual basis on enhancements to diagnostic and medical equipment and services, using comparable indicators, and to develop the necessary data infrastructure for these reports" (para. 8).

Resource Requirements

The estimated cost of an MRI scanner, depending on the model, is between three and four million dollars. Philips Electronics (Netherlands) and General Electric (U.S.) are the two leading makers of MRI scanners.

Annual operating cost for one MCI scanner is around one million dollars. The cost in Canada usually varies between $300 and $600 on a per case basis. The number of people receiving a MRI in Canada varies significantly by province. In 2005, Alberta had the highest scan rate at 36.6 per 1000 (CIHI, 2005). Newfoundland had the lowest at 8.5 per 1000.

2.6.3 Powered Upper Arm Prostheses

The loss of a limb can occur in many ways. Birth-defects, accidents and wars are common factors. Upper limb prostheses attempt to compensate for the loss of a hand or arm, in terms of both functionality and appearance. We can think of upper limb prostheses, however, as more than simply providing someone with a piece of equipment. It is better seen as a rehabilitative program which also includes counseling and education on the use of the prosthesis. This rehabilitative program requires the support of a multidisciplinary team - including a prosthetist, an occupational therapist, and engineers – to design and construct prostheses for the unique needs of individual patients and to help prepare amputees for life with their prosthesis.

There are three main types of upper limb prostheses: passive, cable driven and powered. Passive prostheses are often used for cosmetic purposes. They aim to relieve some of the social stigma of having lost a limb. Limiting social stigma can be of major importance for some patients. Passive prostheses may also be used in circumstances where electronic prostheses are not viable, e.g., within water. Some amputees would have two prostheses, a powered prosthesis for normal use and a passive one for activities such swimming. Cable driven prostheses operate using cables usually attached to the patient's opposite shoulder. Moving the shoulder muscles opens and closes the prosthetic hand. Powered prostheses have battery-power motors, which allow for the opening, closing and turning of the prosthetic hand. Sometimes these motors can be controlled either by a switch or toggle. This is suitable for patients who, while having a defective limb, still have some appendage. Most powered upper limbs are controlled by myoelectric impulses. Sensors

in the prosthesis pickup signals from muscle contraction in the stump of the person's limb. These signals control the movement of the prosthesis. Powered prostheses are usually more comfortable than cable prostheses because they do not require a harness. They also have greater pinch strength. Powered prostheses are, however, less effective in dirt and water or around elements that may damage the electronics, e.g., grease or certain solvents. Some hybrid prostheses use both mechanical and electric elements.

The success of prostheses is judged by their functionality, comfort, reliability, appearance and overall patient satisfaction. A team of health care professionals, including prosthetists, need to assess individuals on a case-by-case basis. The prosthesis needs to be designed to fit each particular patient based on their unique level of disability. The extent of the injury or defect greatly influences the type of prosthesis which may be available. Functional prosthetic joints are made for the hand, wrist, elbow and shoulders. The preferences of the person receiving the prosthesis are also very important in choosing the right prosthesis.

Recent prostheses are constructed to be lighter, quieter and to have a longer battery life. Some prosthetic hands can now detect slippage of objects in their grasp and adjust their grip strength to hold the object tighter without breaking it.

Children face unique challenges with prostheses due to the fact that their bodies are still growing. Children quickly out grow their prosthesis. Refittings can be required every year or two. In 2004, IWK children's hospital in Halifax surgically implanted an upper

arm prosthesis which will expand as the child grows (CBC, 2004). This type of prosthesis is still at the experimental stage.

Coverage for prostheses under public insurance plans varies widely across the country. The War Amps are a Canadian charity and support group for amputees. They offer some support, both social and financial, to amputees through their Adult Amputee Program and their CHAMP Program for patients under 18 years of age.

Resource Requirements

The resource requirements for prostheses vary from case to case. Because prostheses are individually fit, factors such as the extent of the damage to the limb, the level of ability the person has and their preferences in terms of functionality greatly affect the overall cost. The overall cost of providing a prosthesis can range from $6000 and $35,000 per case. There are numerous companies which supply prostheses. Otto-bock (Germany) and Hanger (U.S.) are the two largest suppliers.

The loss of an upper limb is a fairly rare occurrence, effecting less than 100 people per 100,000. A prescription for a powered upper arm prostheses would be relatively rare. Although there is some variation in prescription rates across the country, the patient population is very small. Less than 1 person per 100,000 would receive a new myoelectric prosthesis annually in Canada.

2.5.4 Overview of Areas of Care

Table 2.5 provides an overview of the three areas of care in terms of their potential impact on patients, demonstrated effectiveness, estimated cost per procedure, and estimated annual patient population.

Table 2.5: Overview of Areas of Care

	Endovascular Coiling	**MRI**	**Upper Powered Arm Prostheses**
Impact	Potential life saving	Varies depending on application	Improves functionality and self-esteem
Evidence for Effectiveness	Little clinical research; Accepted practice by neurologists and radiologists	Well established technology; Level of evidence for effectiveness varies depending on application	Well established technology; Effectiveness dependent on compliance of individual patients
Cost (Est.)	$3 million initial investment; $10,000 per case.	$3 to $4 million initial investment; $500 per scan.	Between $6000 and $35,000 per case
Annual Patient Population (Est.)	Between 1 to 20 procedures per 100,000	Between 3600 to 850 scans per 100,000	Less than 1 prosthesis per 100,000

CHAPTER 3: METHODOLOGY

This chapter describes the methodological choices made within this project. The topics covered include the rationale for choosing a multiple case study approach, the selection and structure of the case studies, methods of data collection, a review of issues relating to the conduct of qualitative research, the development of data collection instruments, the selection of participants, the method of analysis, the method of writing up results, the delimitations of the project, a review of ethical considerations, and a knowledge transfer strategy for the project.

3.1 Research Strategy

The ultimate purpose of this study is to improve the allocation of health care resources, by first determining how resource allocations are made, without tying the investigation to a pre-determined framework. Following the recommendation of Hurley et al. (2000), it was determined that it would be most useful to focus on how resource allocation decisions were made in a few selected areas of care, rather than taking a more general view of resource allocation. This level of focus still leaves open a number of crucial methodological questions. The first question to be addressed is which research strategy to use.

The research strategy must be appropriate for the project's research objectives. As listed in section 1.1, this project has seven aims. The first six aims can be seen as research aims and the seventh, transferring research results to interested audiences, as more of an operational aim of the project. In choosing a research strategy, consideration needs to be

given to what is the best way of addressing each of the six research aims. The knowledge transfer strategy for the project, needed to meet its operational aim, is set out in section 8.3 below.

Yin (1994) identifies five possible research strategies: experiments, surveys, histories, archival analysis, and case studies. Resource allocation decisions have in the past been investigated using four of these: experiments (Mitton & Donaldson, 2003a), surveys (Reeleder et al., 2005; Deber et al., 1994; 1995), archival analysis (Eyles et al., 1991; Birch & Chambers, 1993; Birch et al., 1993; Eyles & Birch, 1993; Birch et al., 1996; Newbold et al., 1998), and, most common, case studies (Hunter, 1980; Singer et al., 2000; Mitton & Donaldson, 2001; 2003b; 2003c; 2004; Martin et al., 2003; Mitton et al., 2003; Bell et al., 2004; Gibson, Martin & Singer, 2004; Halma et al., 2004; Mitton & Patten, 2004; Reeleder et al., 2005).

This project follows the lead of many other studies in this area and adopts a case study approach. The reasons for this choice include: 1) the weakness of the other strategies for achieving most of this project's aims, and 2) the appropriateness of the case study approach. Experiments are neither suitable nor viable given the type of information the project aims to capture and the lack of control the researcher has over decision making within health care organizations. Surveys cannot capture the data in sufficient detail nor are they good at delineating the type of operation links which this project hopes to identify. Because the project is focused on how resource allocation decisions are currently made, a historical approach would not be appropriate. While archival analysis

can help provide some context to the decisions, again, it cannot sufficiently capture the factors which determine how resources are currently allocated within health care organizations. Yin (1994) writes, "case studies are the preferred strategy when 'how' and 'why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context" (p.1). All three conditions hold for the main subject matter of this project: how selected resource allocations are currently made by Canadian health care organizations.

Determining how resource allocations are made is, however, only one of the aims of this project. The second aim is to compare these cases of resource allocation across the selected area of care and across the three provinces. It is obvious that this aim requires the use of a multiple case study approach.

The third research aim, to test the applicability of some of the proposed approaches for improving priority setting within the cases selected, also assumes the use of case studies. Eight proposed approaches likely to be applicable to the cases have been identified through the literature review: rational decision models, service guidelines, needs-based capitation models, screen models, cost-effectiveness analysis, program budgeting and marginal analysis (PBMA), accountability for reasonableness, and calls for increased public participation. The criteria for testing the applicability of these approaches are discussed in Section 3.1.3.

The fourth and fifth aims of this project are to identify what decision makers think are best practices for allocating resources and what decision aids they would find useful for making future resource allocation decisions. Yin (1994) identifies the type of questions each research strategy is most appropriate in answering. "How" and "why" questions can best be answered using a case study approach. For questions which are trying to identify what a situation is, or what people's opinions are, a survey approach is more appropriate. The aims of identifying best practices and possible decision aids seem to be of this second type of question and therefore may be more suitably pursued through a survey research strategy. As part of the data collection, all decision makers were ask to identify any best practices around resource allocation and the type of decision aids they would find useful in making future resource allocations. The inclusion of these two questions can be considered as a very small survey embedded within the case studies. Because of the limited nature of the survey and very close connection to the case studies, these questions have been treated in this study has as part of the cases themselves.

The sixth aim of this project, making recommendations for improving the allocation of health care resources, draws together the conclusions reached in achieving the other five research aims.

3.1.1 Selection of Focus

As stated in the introduction, the cases were chosen to ensure a level of variability. This variability was partly secured by examining cases in different areas of care, e.g., acute

care, diagnostics and rehabilitation. Each case also raises unique and interesting resource allocation issues. A third consideration was that there was some indication that others were interested in how resources were allocated in the selected area. It is clear that other cases could have also met these three criteria and may have been examined without greatly impacting on the overall direction of the project.

While all three areas of care met the inclusion criteria, each was ultimately selected for different reasons. From May to August 2004, I was a research assistant to Mr. Wayne Miller, Director of Research and Planning for Eastern Health. One of the issues addressed by the department during this period was whether Eastern Health should invest in an endovascular coiling program. This work provided me with a background on endovascular coiling and alerted me to the fact that the issue of whether to establish an endovascular coiling program was being faced by other regional health authorities across the country. The choice of endovascular coiling built upon work already completed by the investigator and took advantage of the institutional interest in this area of care.

MRI was selected because it was a high profile area of care. Diagnostic imaging, including MRI, was identified as a priority area for funding within the *2003 Health Care Accord.* It was also known that there are a number of resource allocation issues concerning MRI being faced by health care organizations across the country, including the attempt to establish usage guidelines, decisions around buying new machines, decisions around how machines would be geographically located, and around the management of wait times.

The decisions to investigate the first two areas were straightforward. However, the selection of the third area was more serendipitous. Consideration was given to choosing a third area of care outside of the areas of diagnostics and acute care, given that the first two cases were in these areas. In early September 2004, I attended a lecture by Dr. Ed Biden of the University of New Brunswick's Centre for Biomedical Engineering (Biden, 2004). The lecture gave an overview of the Centre's work, particularly as it related to the development, installation and training for powered upper arm prostheses. One area of future research Dr. Biden identified was the need to better understand the reasons for variation in public health insurance coverage of powered upper arm prostheses across the country. Following discussions with Dr. Biden, and his agreement to provide guidance to the project, powered upper arm prostheses was selected as the third area of care to be studied.

3.1.2 Selection of Setting

Newfoundland was chosen as a province based on the interest of this province to me and the fact that I was studying there. Being located in the province had clear advantages when arranging for interviews with decision makers. The other two provinces selected were Alberta and Saskatchewan. The choice of these two provinces was based on consideration about having a good geographic distribution across the country, with two Western provinces and one Eastern province; the variations in size of the provinces, e.g, Saskatchewan has twice the population of Newfoundland, and Alberta has three times the population of Saskatchewan; the geographic distribution of their populations, with Alberta and Saskatchewan having two main urban centre and Newfoundland having only

one main urban centre; structure of their health care systems, in that they all had regional health boards; the financial strength of the provinces, with Alberta being in a better economic situation compared to the other two provinces; and perceived philosophical differences between the provinces, with Alberta being perceived as being more open to private sector reforms.

Because MRI and endovascular coiling are high level medical procedures, in choosing regional authorities in each province, consideration was given to those regions which provided high level tertiary care. Appropriate health regions in each province were identified through internet searches and discussions with policy researchers in each province. Given that more than one appropriate region was identified in each province, regions were chosen based on practical considerations about conducting the project in each province, e.g., whether a local research contact could be identified within the region. All three regions initially contacted agreed to participate in this study.

3.1.3 Structure of Cases

This project starts with the hypothesis that it is useful first to determine how resource allocations are made before applying any pre-established framework, which suggests taking a more grounded theory approach to examining resource allocation decisions. Charmaz (2005) describes grounded theory as a method of focusing on the data "to build inductive middle-range theories through successive levels of data analysis and conceptual development" (p. 507). While more closely related to grounded theory than most other studies of resource allocation, this project is not a pure example of grounded theory. Part

of the reason is the need for the cases to have some structure before data collection begins in order to provide the project with a manageable scope. This need for structure raises two important issues. The first is how to delineate what is included in the cases. The second is how to structure the cases so that they allow the project to meet its research aims.

The first step is to define the cases. How the cases were selected offers good guidance here. First of all, the cases relate to resource allocation decision making around acute care, diagnostics, and rehabilitation. Given that this is an exploratory study, the researcher gave a fairly wide recognition to what was considered as relevant to resource allocation decision making in each area. If a decision influenced how funds, equipment, or human resources were allocated within either of the program areas or affected the access patients had to the service, it was included as relevant. The data collection thus captured a good deal of information about the general budgeting processes relating to health care in all three provinces.

The cases can also be defined geographically. Resource allocations were examined in three provinces: Alberta, Newfoundland and Saskatchewan. The cases include both how the provincial governments allocated resources and how these resources are further allocated within the three regional authorities studied.

Finally, the cases should be defined temporally. As health care organizations try to improve their processes for allocating resources, these decision making processes are

constantly changing. All the organizations studied identified some current reform relating to resource allocation which they are trying to enact. Although the decision making structure of these organizations are likely to remain fairly similar for some time, strictly speaking, the cases in this study only reflect the decision making processes which were in place during the period for which data was collected: Alberta (November 2005), Newfoundland (March to May 2005), and Saskatchewan (March 2006).

Given the variables by which the cases can be classified, it is best to say that this study examines nine cases, determined by place and area of care and limited by a particular period in time. These nine cases are identified in *Table 3.1* along with the limiting time period.

Table 3.1: Identification of Nine Cases

	Alberta	**Newfoundland**	**Saskatchewan**
	November 2005	**March – May 2005**	**March 2006**
Endovascular Coiling	**1**	**4**	**7**
MRI	**2**	**5**	**8**
Powered Upper Arm Prosthesis	**3**	**6**	**9**

The second task is to determine how to structure the cases. Both political science and health policy studies offer some direction here.[17] Brooks (2003) emphasizes the

[17] Allison and Zelikow (1999) argue that there are three perspectives from which to describe governmental decision making. The *Rational Actor Model* analyzes events and decisions as if the government acted as one, rational individual. On this view, events are explained by determining their purpose for the

importance of institutional structures, interests and ideas on policy decisions. Pal (2001) focuses on the process by which a policy decision gets made, the content of the policy and its effect. Taylor (1978) analyzes health care decision making in terms of the inputs or impetus for the policy discussion, the 'withinputs' within government, the outputs in terms of the result of the policy decision and, finally, the wider impact of this policy outcome. Hacker's (1997) case study of the failure of the Clinton health plan is structured around how the issue came on the policy agenda, the parties involved, their interests and the outcomes.

Specifically regarding cases of health resource allocation, Hope et al. (1998) identify two key questions which need to be answered. The first is: what is the process by which a decision was made? The second is: what are the grounds for making the decision? Singer et al. (2000) expands on these two questions and identifies six elements which they see as important to cases of resource allocation: 1) the institutions in which the decision are made, 2) the people who make the decisions, 3) the factors they consider, 4) the reasons for the decisions, 5) the process of decision making, and 6) the appeals mechanism for challenging the decisions.

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government as a whole. The *Behavioral Model* is based on organizational theory. It looks at the logic, capacities, culture and procedures of the organizations that constitute the government. Rather than looking at purposeful acts, the analysis instead focuses on the outputs of the organizational functions. The *Governmental Politics Model* examines government decision making as the result of bargaining amongst players within a decision making organization. On this model, understanding an event requires knowing the different bargains made by groups within the government which resulted in a decision. While recognizing these different perspectives, it is beyond the scope of this project to consider these different models directly as part of the cases. Of these three models, the case studies perhaps most closely relate to the Behavioral Model Approach.

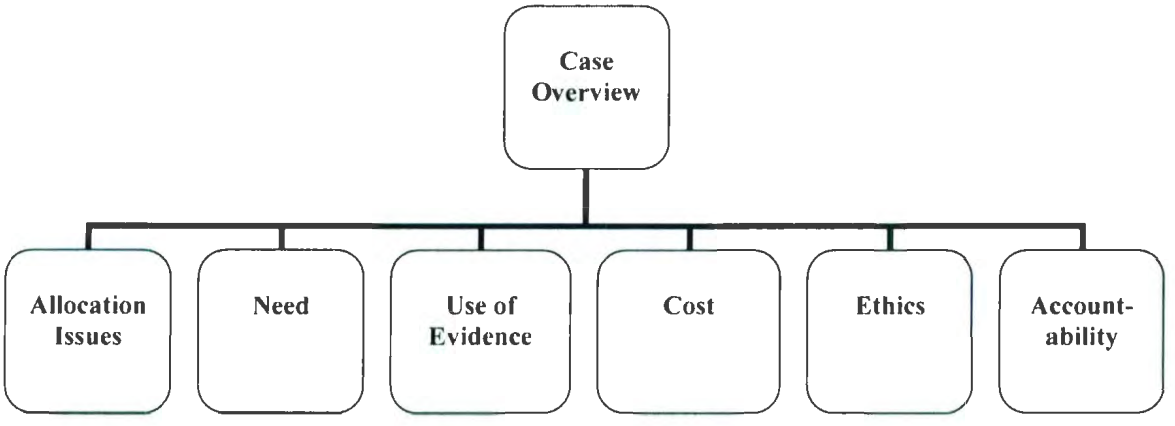
Each case in this study will provide an overview of all six of these elements as suggested by Singer et al. (2000). The cases will also review how issues related to the three areas of care get on a health care institution's agenda (Hacker, 1997). Because of the focus of this study is on decision making processes, rather than specific decisions, some of the other factors identified above are not directly applicable, e.g., the impact of policy outcomes. The influence of interests, institutions and ideas on resource allocation decision making, however, may be captured to some extent in the analysis of the cases.

The cases will also focus on some selected areas of interest to allow for better comparisons across the cases. Yin (1994) calls the examination of specific areas of interest within a case study as *embedded analysis*, as opposed to *holistic analysis* which does not identify before hand specific areas in the cases to focus on. The cases will focus on six factors or *embedded components*. These components were all determined by the literature review. The first component is the specific resource allocation decisions faced in each of the cases. There are likely to be a number of decisions which affect the allocation of resources in the three areas of care. For example, with MRI, there may be decisions regarding the purchase of new equipment, the location of new equipment, the booking of case, the establishment of usage guidelines, etc. This situation raises a number of interesting questions across the cases. Is the same set of issues being faced in each area of care? Are there differences in the resource allocation questions faced between the provinces within the same area of care? In order to further allow for comparison, the allocation questions identified in each case will be classified according to the classification of health care decisions developed in section 2.2, namely in terms of the

type of allocation decision (funding level, funding arrangements, broad service categories, specific services, clinical circumstances, socio-demographic circumstances), who makes the decision and how the decision is made (closed-door / top-down, bilateral, hands-off / bottom-up).

In Chapter 2, Section 3, five factors were identified which are often considered when evaluating or determining resource allocations. These five factors are identification of need, the use of evidence, consideration of cost, ethical issues and accountability. The cases are structured to determine how these five factors are handled within each case. The six embedded components of the cases are illustrated in *chart 3.1*.

Chart 3.1: Embedded Components of Case Studies



This embedded case structure supports the study's research objectives in a number of ways. The case structure provides an overview of the decision making process in each

case, identifies the resource allocation issues involved and considers how each of these four key aspects of resource allocation are addressed. The case structure allows then for a fairly broad overview of the resource allocation issues involved, which is one of the key aims of this project. The structure also allows for fairly easy comparisons across the nine cases.

The criteria for determining what constitutes a best practice or what would constitute a difference between cases is hard to clearly specify. The same can be said for the criteria for determining whether the proposed approaches for improving resource allocations are applicable to the cases or not. For the applicability of the proposed approaches, the table outlining the main features of the different approaches provided in section 2.4.8 gives some guidance, but it still does not provide clear criteria. Determining whether something is a best practice or whether a proposed approach is applicable to the cases will depend to some extent on the judgment of the researcher. A clear case structure, with a focus on selected areas, will allow for easier comparisons, thereby better enabling the reader to judge the reasonable of the researcher's conclusions.

3.2 Data Collection

Just as previous studies on resource allocation have used various research strategies, so too have they used various data sources. Mitton and Donaldson (2003a) use a participatory action approach, augmented by direct participant observation, interviews and focus groups. Reeleder et al. (2005) and Deber et al. (1994; 1995) use questionnaire surveys. Halma et al. (2004) use a panel involved in the decision making to follow certain issues through the decision making process and a semi-structured follow-up survey of panel participants. Martin et al. (2003) and Mielke et al. (2003) use document reviews, key informant interviews, and direct participant observation. All of these methods of data collection are useful in determining different aspects of resource allocation decisions.

This project seeks to capture the views of senior decision makers and health care providers working across numerous sites in three provinces. This situation did not make it feasible to pursue a participatory action approach. With the range of sites, the sensitivity of the issues being discussed, the likely lack of access and the numerous decision making bodies involved, direct observation was also not a viable means of collecting similar levels of data across all the cases.[18] Because of the exploratory nature of the study and the desire to capture some of the context of the decision making process, a survey questionnaire was not seen as being able to provide sufficient data.

[18] This researcher was invited to view one priority setting session at Eastern Health. Because there was no opportunity to get consent from participants, these observations were not analyzed as part of this project.

This project uses both reviews of existing documents and key informant interviews. These are the same two data sources used by Bell et al. (2003) to investigate resource allocation. Reviewing existing documents was an obvious source of data. Websites, published reports, news releases, annual reports and government legislation all provide useful information about the decision making processes. Given the need for further information about these processes, much of which was only known by participants involved in them, reviewing existing documents was not sufficient. The manner in which health care resources are allocated, both across and within regions, is complex, with decisions often involving unique factors. Interviews are an excellent way to research phenomena which are not confined to simply answers or which answers often have to be further explicated. This is one of the reasons Rubin and Rubin (2005) suggest that "qualitative interviewing projects are especially good at describing social and political processes" (p. 3). Discussions with decision makers in the lead up to this project, conducted by both myself and my colleagues on the "Building a Public Dialogue" project, found that many decision makers also felt interviews were the most appropriate way to collect information about how resource allocation decisions are made.

3.2.1 Issues in Using Qualitative Research

Having chosen to use interviews as a data source, consideration should to be given to the factors which enhance conduct of qualitative research. There is a very large and growing literature about the use of qualitative methods. This section will be limited to two key topics: 1) ensuring rigor in the study, and 2) increasing the generalizability of the research results.

Rigor

In this project, the researcher does not directly observe how resource allocation decisions are made. The project relies to a great extent on information provided through key informant interviews. Dobbin and Gatowski (1999) point out that one of the short comings of interviews is that they provide only "indirect information filtered through the view of those interviewed" (p. 116). In other words, the responses given by the interviewees are only their interpretation of the events. Interviewees may forget certain details or over emphasize the role of some factors. They may make false statements. The researcher then uses this data, long with existing printed material, to make his interpretation of how resources are currently allocated within each of the nine cases. The account of the decision making processes given in this project are based then on two levels of interpretation: the participants' and the researcher's. The fact that the conclusions of the project are based on multiple levels of interpretation is not a flaw in the project's design. In fact, it is a common feature of all qualitative research not based on direct observation. In order to ensure an acceptable level of rigor, the researcher must show that he has appropriately dealt with both levels of interpretation.

Mays and Pope (1995) say that "the basic strategy to ensure rigour in qualitative research is systematic and self conscious research design, data collection, interpretation, and communication." (p. 110). Clearly setting out a detailed research strategy and the consistent application of that strategy across all the phases of the project is essential for ensuring rigor in qualitative research. Mays and Pope (2000) further suggest a number of

techniques to help ensure the rigor of qualitative research. These techniques are: clear exposition of methods of data collection and analysis, triangulation, fair dealing, attention to negative cases, respondent validation, and reflexivity. This project has tried to incorporate all of these techniques.

The first technique Mays and Pope suggest is clear exposition of methods of data collection and analysis. This chapter, outlining the methodology of the project, aims to be as thorough as possible to ensure that the reader is able to evaluate the steps taken throughout the project. Special attention has been given to issues such as how the data sources are identified, how the data collection instruments are developed, how participants are selected, how the data is analyzed, and how the cases are structured and written up.

The project triangulates data sources, both in terms of the different interviews and across different types of data, i.e., interviews and reviews of existing material. There is also triangulation in terms of the different professions of the people interviewed, e.g., physicians, regional health authority executive members, and provincial officials. Agreement across the different sources of data, cases and professions of interviewees helps verify the validity of the interpretations being made.

The next two techniques Mays and Pope identify are fair dealing and attention to negative cases. Fair dealing refers to the need not to rely solely on representatives from one group, but to get perspectives from various groups on the subject matter. Attention to negative

cases means ensuring that cases contrary to the researcher's conclusions are identified and discussed. Each case is developed based on a number of interviews. In each case, the interviews were with interviewees holding different roles in the decision making processes and different professional backgrounds. There are constraints on the use of fair dealing for this project, because of the limited number of people involved in the allocation of resources in the selected cases. To help ensure that negative cases are identified, any disagreements amongst the data about the processes for allocation of resources will be identified and discussed in the cases.

Mays and Pope suggest the use of respondent validation, i.e., that interview transcripts be reviewed by the interviewees to ensure that the information provided is accurate. There was some difficulty in carrying out respondent validation for this project. The researcher did offer roughly a third of the interviewees the option of reviewing the transcripts of their interviews. Only one person was willing to review the information they had provided, and then only as a brief e-mail outlining any key points that may be used in this thesis report. The researcher felt that this reluctance to review their transcripts was a result of the professional time constraints on the interviewees. Because of the reluctance to review interview transcripts, the researcher abandoned this method for helping to ensure research rigor.

The final technique Mays and Pope (2000) suggest for improving the rigor of qualitative research is reflexivity. Reflexivity requires the researcher to declare their relationship and interest in the project. The need for reflexivity within qualitative research arises

because of the influence the researcher has on the course and outcome of the project. Explicitly declaring the researcher's interest or leanings towards a topic is meant to alert the reader to any possible bias on the part of the researcher. The researcher's involvement in this project arose from his involvement on the *Building a Public Dialogue Framework for Defining the Medicare Basket*. The main aim of the Medicare Basket project is to develop a framework for engaging the public about Medicare coverage decisions. This thesis project is meant to help add to the knowledge generated by the Medicare Basket project by examining different issues surrounding public Medicare coverage and health resource allocation.

Generalizability

This project would be of limited value if the application of its conclusions were confirmed only to the nine cases studied. The project aims then to maximize the application or generalizability of its conclusions. The idea of generalizability in qualitative research is different than statistical generalizability. Generalizability in qualitative research depends upon the reader recognizing sufficient similarities between the case studied and the cases in which they consider applying the results. Pope and Mays (2000) suggest two ways a research project can hope to increase its generalizability. The first way is to provide sufficient detail so that the reader is able to judge whether the findings in the study are likely to be applicable in the situation the reader is concerned with. This goal of providing sufficient detail to understand how the cases are developed has been a constant one throughout the project. Pope and Mays also suggest that cases "include as many as possible of the factors that might affect variability of behaviour" (p.

54). The main rationale for choosing fairly different areas of care to focus on and to examine decisions in three different provinces was to extend the range of divergent factors covered by the cases. If conclusions are found to hold across the nine cases, it is likely that these conclusions will have wider application for other cases of resource allocation.

3.2.2 Development of Data Collection Instruments

This research project is fairly expansive, covering nine cases and six embedded components in each case. In order to guide data collection, the information needs required for each case were identified. This identification of information needs was based on considerations of the project's objectives, the structure of the cases, and the literature review. Information needs were formulated as questions and put in a table, provided in Appendix C. Where applicable, questions were matched with discussions of the topic found within the academic literature. The table was then used to identify the proposed data source for answering each question, e.g., interview question, publicly available documents, or comparisons across the cases. Efforts were made to identify a data source for every question.

Based on this table, an initial set of interview guides were developed. A specific interview guide was designed for each type of likely participant: 1) department head, program manager, or clinical chief; 2) senior health care manager; 3) members of the provincial Department of Health; 4) senior provincial government officials in other

relevant department; 5) Ministers or former Ministers of Health; and 6) advisory board or expert panel members. An example of each of these guides is provided in Appendix D.

It became apparent once these guides were developed that they were too long and too detailed to be workable in the interviews. In order to make the best use of the interviewees' time, the interviews were designed to be completed as quickly and efficiently as possible. Given the fact that many of the people who participated in this project hold senior positions in the government and the health care sector, the aim was to complete an interview in approximately one hour. Finally, interviews were meant to allow interviewees to have as much control over the direction of the interview as possible while still ensuring all relevant topics were covered.

The initial set of interview guides did not support these objectives. Simplified interview guides were developed, usually consisting of no more than ten questions. Questions focused on the decision process, the factors considered in making decisions, the five embedded elements in the cases and the identification of best practices / decision aids. Interview guides were adjusted for each interview to reflect the interviewees' positions and their likely participation in the decision making process around a particular area of care. The use of fewer questions, more focused on the likely experiences of the individual participants, increased the amount of relevant data received from fairly short interviews and allowed for a better flow within the interviews. The researcher also asked more probing questions about a topic if more information was required. The revised interview guides are provided in Appendix E.

3.2.3 Identifying and Contacting the Respondents

The target population for this study is decision makers and health care providers involved in making resource allocation decisions in the three selected areas of care in the three provinces. The researcher attempted to interview all persons identified within the target population.

Almost all of the people interviewed were sent an introduction package about the project at least a week before their interview. This introduction package included an introductory letter, a brief project description, a copy of the consent form for their particular province and their specific interview guide. The introduction letter outlined the rationale of the study, identified the investigator as a graduate student of Memorial University, identified and provided contact information for his two thesis supervisors, outlined the consent process and described the measures taken to ensure the confidentiality of responses. The interview guides were included to give the interviewees a better understanding of the type of information the researcher was interested in discussing. In the cover letter for those who contract was first made by the researcher, it stated that the researcher would contact the person by phone on a specific date to hopefully arrange for a mutually convenient time for an interview. In some cases, circumstances did not allow for the interviewee to receive an introduction package before the interview. For example, in two cases, interviewees invited another person to their interviews. These people were not known to the researcher until the time of the interview.

There were slight differences in how participants were identified and contacted in each province. In Alberta, the local research contact provided a list of relevant persons within his health region. After agreeing to the list and securing ethics approval, the researcher provided introduction packages to the research contact's executive assistant, who forward them to the relevant persons and arranged for interviews.

Potential interviewees in the Government of Alberta were identified through a search of the government's website (2006). These potential interviewees were then sent introduction packages and contacted directly by the researcher to arrange for interviews. In some cases, the person initially contacted would suggest a more appropriate person within his or her organization to deal with the research request. This person was then contacted by phone or mailed an introduction package, depending on whether or not the initial person contacted had already forwarded the introduction package he or she had received to the person they suggested should participate.

In Newfoundland, potential interviewees were identified either through first hand knowledge; discussions with one of my thesis supervisors, Dr. Doreen Neville; or through a search of the websites of the Government of Newfoundland and Labrador (2006) and Region B. Some participants identified other possible people of interest. Seven additional possible participants were suggested by interviewees. All of these people were invited to participate in this project, but only two agreed to be interviewed.

In Saskatchewan, the local research contact and the researcher discussed relevant persons within Region C to be interviewed. Potential interviewees were also identified through a search of the Government of Saskatchewan's website (2006). Participants were sent introduction packages and contacted by the researcher to arrange for interviews. One participant, when contacted, suggested the researcher also interview another person in their department. This person was contacted by phone and interviewed. Another participant felt that they were not the most appropriate person to be interviewed within the organization and suggested four alternatives. Three of these were deemed to be relevant by the researcher and were sent introduction packages. All three agreed to be interviewed.

In Saskatchewan, one participant independently invited two other people to their interview. Likewise, in Newfoundland, one participant invited another participant to the interview. The addition of these people to the interviews was not known to the researcher until he arrived for the interviews.

The information on the targeting and contacting of participants is summarized in *Table 3.2*.

Table 3.2 Methods of Identifying and Contacting Target Population

	Alberta	Newfoundland	Saskatchewan	Total
Dates	Nov. 10 - 17, 2005	March 23, 2005 – May 10, 2005	March 13 – 16, 2006	
Identified by Researcher	4	17	12	33
Identified by Others	13	7	9	29
Initially Contacted by Researcher	6	23	19	48
Initially Contacted by Others	11	1	2	14
Total Invited to Participate	17	24	21	62

3.2.4 Consent and Confidentiality

The project is designed to ensure both the anonymity and confidentiality of all participants and their responses. In an introductory letter, participants were informed of the conditions under which they were asked to participate in the project. Participants were also advised in the introductory letter of the nature of the study, the proposed use of the data, that the confidentially of the persons involved would be strictly maintained, that their names would only be known by the principal researcher, that their participation was completely voluntary and that they may refuse to answer any questions they wanted at any time.

Participants were again advised of the terms of their participation before the start of their interviews and were asked to sign a consent form outlining their agreed involvement in the study. This included the participants who were not known to the researcher prior to the interviews. Consent to be record by audio tape during the interview was sought for all interviews. Consent forms for phone interviews were signed by the participant and faxed to the researcher before the start of the interviews. Specific consent forms were developed for each province.

Interview tapes, interview notes and transcripts were assigned random unique identifiers. This identifier prevented others from determining the identities of participants simply by looking at the tapes or the transcripts. The data was stored in a locked office and was inputted only on a password protected computer system located in the Division of

Community Health of Memorial University. In accordance with university guidelines, the data will be destroyed after five years.

Publications and reports resulting from this project will not directly or indirectly identify participants nor attribute direct quotes to any specific participant. All direct quotes describe the respondent only as "a participant" and will not provide any information which could reveal the identity of the participant.

3.2.5 Interviews

Rubin and Rubin (2005) outline an approach to interviewing they call *responsive interviewing*. The basic elements of this approach are to identify knowledgeable people with first-hand experience of the subject matter, listen carefully to them, and ask follow-up questions during the interviews to ensure as great an understanding as possible. This approach to interviewing was adopted for this project.

Rubin and Rubin (2005) also emphasize two important aspects of interviewing at various sites, which in this project occurs by interviewing participants from different provinces and different organizations. The first aspect relates to the evolving nature of qualitative research projects. As initial interviews are conducted and analyzed, initial findings and themes become identified. Interviews in other sites allow for an opportunity to test these evolving themes. In this project, some decision makers in Alberta and Saskatchewan were directly asked for their opinions of tentative conclusions resulting from the interviews conducted in Newfoundland. Secondly, testing in other sites helps determine

the generalizability of a project's findings. If similar results are found in different sites, especially if there are significant differences between the sites, the researcher can be fairly sure that results are generalizable to other cases. This goal of enhancing generalizability was one of the reasons for designing the study to ensure sufficient variability across the cases and to examine different provinces.

Interviews conducted for this project were all semi-structured based on the revised interview guides described in section 3.2.2. The purpose of a semi-structured interview is to encourage participants to talk freely. This attempt to limit the influence of the interviewer needs to be balanced, however, by the need to cover particular topics. The interviewer allowed the conversation to flow from one topic to another as much as possible to allow the participants to say what they wanted to say in the way they wanted to say it. The researcher also ensured that all the questions in the interview guide were covered during the time allotted for the interview. When required, further probing questions were asked to encourage the interviewee to elaborate on a particular topic or theme. Interviews ranged in length from around 30 minutes to two hours in length, with most lasting approximately 50 minutes. The interviews were all conducted by the principle researcher, which helped ensure continuity across the interviews.

Most interviews were conducted in person. It was hoped that in person interviews would make the interviewee more comfortable and relaxed. Most interviews were carried out in either the decision maker's office or other suitable location within their work environment. In three cases, interviews were carried out over the phone. If the

interviewee consented, interviews were tape recorded and additional notes were taken if needed. If the interviewee did not consent to a taped interview, only notes were taken.

There were 43 interviews conducted for this project of which 35 were taped and transcribed.

In Alberta, seventeen people were invited to be interviewed, of which fourteen were interviewed. The participation rate was 82%. This high participation rate was due in part to the work of the local research contact in identifying and directly contacting participants in Capital Health. Nine interviewees consented to having their interviews taped.

An issue which arose in every province was that interviewees, through internal communications within their own organizations, found out about other intended interviewees. Often this resulted in interviewees from the same department asking to be interviewed together. In order to accommodate the wishes of the interviewees, the researcher granted these requests. As noted above, in two cases, interviewees independently invited others to participate in the interviews. In all of these cases in which two or more participants were interviewed together, the interviews were taped. In Alberta, while nine people agreed to have their interviews taped, there are only six tape transcripts because three groups of two people were interviewed together.

In Newfoundland, 24 people were invited to be interviewed, of which fifteen were interviewed. The participation rate was 62.5%. Fourteen interviewees consented to

having their interviews taped. Only one group interview, consisting of two people, was conducted in Newfoundland, so that there were thirteen interview transcripts.

In Saskatchewan, 21 people were invited to be interviewed, of which fourteen were interviewed. The participation rate was 66.6%. Twelve interviewees consented to having their interviews taped. Only one group interview, consisting of four people, was conducted, so that there were nine interview transcripts from Saskatchewan.

Given that these interviews are supposed to inform a number of different case studies, it is important to consider also how the interviewees are distributed across decision making organizations and across the specific areas of care. Provincial officials generally provided an overview of how resources are allocated by the provincial government to the regional authorities or gave detailed descriptions of relevant provincial programs relating to the areas of care. Members of the executive of regional authorities provided information about how resources were allocated with their organizations. Both provincial officials and regional authority executives often also had specific information regarding how resources were allocated in the three selected areas of care in their province. At the departmental level, interviews were focused on each specific area of care. For example, interviews conducted in the rehabilitation department of a regional authority were focused solely on how resources for powered upper arm prostheses are allocated. Because endovascular coiling and MRI were managed in the same department in all three regions studies, interviews with professionals in these departments usually covered both areas. The only exception was an interview conducted in Newfoundland with a participant

which was focused solely on endovascular coiling. At the departmental level, the people interviewed included program managers, clinical chiefs, radiologists, neurosurgeons, physiatrists, and prosthetists.

In Alberta, three provincial officials and seven members of the executive team of Region A were interviewed. At the departmental level, three people were interviewed about endovascular coiling. The same three people also discussed MRI. Three people were interviewed about how resources around powered upper arm prostheses are allocated.

In Newfoundland, two provincial officials and six members of the executive team of Region B were interviewed. At the departmental level, four people were interviewed about endovascular coiling. Three of these four people also discussed MRI. Three people were interviewed about powered upper arm prostheses.

In Saskatchewan, four provincial officials and four members of the executive team of the Region C were interviewed. At the departmental level, two people were interviewed about endovascular coiling. The same two people also discussed MRI. Five people were interviewed about powered upper arm prostheses.

A summary of the interview participants is provided in *Table 3.3*. A breakdown of interviews by position is presented in *Table 3.4*.

Table 3.3 Summary of Interview Participants

	Alberta	Newfoundland	Saskatchewan	Total
Number Invited to Participate	17	24	21	62
Number Interviewed	14	15	14	43
Participation Rate	82%	62.5%	66.6%	69%

Table 3.4 Breakdown of Interviewees by Position

	Alberta	Newfoundland	Saskatchewan	Total
Provincial Officials	3	2	4	9
Regional Executive	6	6	4	16
Regional Departmental Level: Endovascular Coiling/ MRI[19]	3	4/3	2	9/8
Regional Departmental Level: Power Upper Arm Prostheses	2	3	4	9

3.2.6 Identifying Existing Documents

A systematic search strategy for identifying relevant documents was not developed for this project. This decision was based on the facts that relevant data was not usually located in a searchable database and the information which was published was contained

[19] All of the people interviewed at the departmental level about MRI were also interview about endovascular coiling. This is due to the fact that in all three regions both programs are run out of the same clinical departments. Only one respondent in Newfoundland talked solely about endovascular coiling.

in different formats. Thorough searches were made of a number of relevant websites and news archives, including those of the interviewees home organizations. There was some level of snowballing in the identification of relevant documents, e.g., if documents were mentioned in interviews, they were located and reviewed. Over forty documents relating to their organizations and resource allocation in the selected areas were also given to researcher directly by interviewees.

3.2.7 Analysis of Data

Interview tapes and notes were all transcribed. All interview tapes were transcribed by a professional transcriber. Interview notes were transcribed by the researcher. Tape transcripts aimed to be as close as possible to the actual conversation. Grammar was not edited in any way and phrases such as "I know" were kept in. Pauses and inaudible parts of the conversation were so marked. During transcription, one tape broke and approximately 30 minutes of interview data was lost. Interview notes were used to partially reconstruct what was covered in the lost data.

Once the interview tapes and notes were transcribed, they were coded. Codes can be developed either deductively (a priori) or inductively (a posteriori) (Bowling, 2002). For this project, codes were developed mostly deductively, due to the fact that many of the key areas of interest had been already identified by the researcher. Themes identified from the interviews were also coded. For example, the idea of the "business case" was raised by a number of participants and a code was developed for this theme. By the end

of the project, approximately 100 codes and sub-codes had been developed and used. Transcripts were coded using the qualitative research computer program N6.

All of the existing documents identified by the researcher were reviewed. Notes were taken of points relevant to the case studies. Where there were disagreements between what was said in the interviews and what was described in the existing documents, the conflict was identified in the written cases.

Once all tape and note transcriptions were coded and the existing documents reviewed, the cases were developed. It had initially been anticipated that nine separate cases would be developed (three areas of care in three different provinces). It soon became apparent however that certain decision making processes, e.g., how provincial governments allocate resources, how the regional authorities set their budgets, etc., affect all areas of care in a province. In order to avoid repetition, cases were developed by province. Each case begins with an overview of the process for allocating resources in the province and in the regional authority. Next a description of the resource allocation in each area of care is provided followed by five sections specifically focusing on the five embedded elements for each area of care. Given the information provided, it was also possible to examine how each of the regional authority deals with the issues of evidence, cost, ethical considerations and accountability. Each case concludes with a section outlining the best practices and helpful decision aids identified in each province.

Once the cases were developed, comparisons were made across the areas of interest identified in the project's aims. In some cases, these comparisons required returning to the original transcripts to clarify or expand on some issues. Recommendations were then developed based on these comparisons.

When using direct quotes in the written chapters, the researcher sought to maintain the confidentiality of the interviewees. Quotes only identified respondents as participants, or in some cases, as a participant from a particular province. Given the small number of relevant decision makers in a province, it was felt that further specification would unduly threaten the confidentiality of the participants.

3.3 Delimitations

Every project needs to set limits on what it will cover and it will not. It is important for determining the extent to which a project's results can be applied to other context to describe these limits and the rationale for them (Jensen, 2005).

One of the main delimitations of this project is that its scope is confined to the decision making processes in three areas of care in three provinces. Some consideration was given to doing a fourth province, but it was beyond the resources available for this project. While increasing the number of cases, either in terms of the number of provinces studied or the areas of care examined, would have increased the generalizability of the project's results did provide sufficient data to meet most of the project's aims and permit a good level of generalizability to other cases of resource allocation.

The project focuses on decision making processes, rather than on specific resource allocation decisions. As stated in the introduction, one of the reasons for this delimitation is that it hopefully will increase the usefulness of this project's results for health care organizations. There are, however, likely to be good insights derived from following how specific decisions are made. This project addresses this issue to some extent. In many cases, the descriptions the interviewees gave of the decision making process in an area of care focused on specific decisions which made been recently made.

3.4 Ethical and Operational Approvals

All required ethical and operational approvals were granted for this project before data collection began. One of the complications faced by this project was that separate applications for ethical and operational approvals had to be made to each provincial ethics board and each region. In order to maintain the confidentiality of participants, only the approval letter from the Human Investigation Committee (Memorial) is provided in Appendix K.

Chapter 4: Alberta

This chapter examines how resources for the three areas of care are allocated in Alberta. The chapter begins by reviewing the decision making structure of Region A. The next sections examine resource allocation in the three areas of care, focusing on the embedded elements of resource allocation decisions faced, need, use of evidence, cost, accountability and ethical considerations for each of the three areas. The final section presents the recommendations, proposed decision tools, and the challenges identified during the interviews in Alberta. In order to provide further context, *Appendix B* presents general demographic, economic, and health care spending data for the three provinces and the three regions.

4.1 Regional Structure

In 1995, Alberta's health system was restructured with the creation of nine regional health authorities. These regional authorities deliver a wide range of health services, including acute care, long-term care, home care, health promotion and prevention activities. There are also two province-wide health authorities. The Alberta Cancer Board provides cancer services for the entire province. The Alberta Mental Health Board governs services and programs in the area of mental health. Mental health programs are delivered through the nine regional health authorities.

Alberta has little direct provincial government program funding in the area of health care, usually limited to specialized services provided by only one or two regions for the entire province. These are high cost, complex services which include transplants, neurosurgery,

and neonatal ICU. In some cases, e.g., around some orthopedic procedures, the services have to be performed first and then funding is forwarded to the region. In other cases, annual allotments are made to the providing regions.

Provincial government funding is primarily provided as global funding to the regions. These global budgets are determined using a per capita based formula, with some adjusters for demographic differences between the regions (Alberta Health and Wellness, 2007). One participant reported that the adoption of formula-based funding was driven by concerns with equity, simplicity, transparency and objectivity. The same participant said the adoption of formula-based funding was also driven by a conscious choice by Alberta Health and Wellness not to micro-manage health care spending.

Adjustment payments are made when care is provided to patients away from their home region. Conceptually, what occurs is that the provincial government takes funding away from the home region to compensate the region which provided the care. The transfer of funds, however, does not occur until the provincial budget two years forward. This requires that the provider region carries the cost of care for two years before they are compensated for it. Costs are usually 'owed' from the rural regions to more urban regions. One respondent reported that often the provincial government will not penalize the region from which the patient originated due to the size of the costs involved and a concern to allow for some budgetary stability. A respondent from Region A said that,

> "there is some attractiveness for us to provide services to patients from other regions because it increases our cost, but it also increases our revenue. So, hopefully, at some point that balances out. It doesn't always because there isn't always a direct relationship to our cost, but... it's close enough that it supports us doing that."

In other words, it is in the interest of the regions to take on these transferred cases because it increases their overall level of resources in future year.

Table 4.1: Regional Structure (Alberta)

Number of health regions in the province	9 regional authorities + 2 province-wide boards for cancer care and mental health
Current health regions established	1995
Scope of regions	Acute care, long-term care, home care, health promotion and prevention activities
Method of funding	Primarily formula-based, global budgeting. Targeted funding to certain regions for providing high-level care.

4.2 Region A[20]

Region A provides acute care, long term care, home care and public health services. It serves both an urban and rural population. In 2005-6, Region A had revenues of over $2

[20] In order to help ensure confidentiality of the region, rough approximations of the data are provided, not exact numbers. The approximations are general enough so that the data could apply to more than one Health Region in Alberta and still provide a fairly accurate indication of the region's size and financial strength. The information in this section is based on information provided on Region A's website.

billion or approximately $2400 for every person in the region. For 2006-2007, the region received an increase in its operating budget of approximately 6%.

4.2.1 Governance Structure

Region A is governed by a board of community members, appointed by the Minister of Alberta Health and Wellness. The board's responsibilities are set out in provincial legislation. These responsibilities include setting health priorities for the region, ensuring reasonable access to care and hiring a CEO. The board also releases a publicly available annual report on the activities of the region, although this report is primarily written by the region's executive team. The board is supported in its duties by a number of board committees which review particular aspects of the region's operations.

Because the health regions are fairly large, the provincial government requires that every health region in Alberta has Community Health Councils which are to provide the board with a more localized community perspective. Region A has a number of Community Health Councils. The members of these councils are nominated by their local communities or by the person themselves. Region A's board selects which nominees will serve on the Councils. These Community Health Councils make presentations to the board throughout the year to outline the concerns of their local communities. This input is meant to help guide the region's operational and strategic planning.

The CEO is delegated authority by the board to oversee the region's operations. Working with the board, the CEO will determine the region's strategic goals. The CEO is

supported by a senior executive team, which meet to approve strategic planning initiatives, set budgets and deal with other issues of concern to the region. Under the CEO, there is an Executive Vice-President and Chief Operating Officer (COO) of Health Services, who is responsible for coordinating and managing health care operations. Vice-presidents are responsible for the main corporate functions of the region, e.g., physician affairs, finance, human resources. There are also two types of COO within Region A. Some COOs are responsible for specific program areas. Others are responsible for specific sites, e.g., the major hospitals. These COOs are all members of the executive team and all report to the COO of Health Services. Many executive team members have responsibility for more than one COO portfolio.

The use of COOs for specific sites partially reflects the management structure before regionalization. Maintaining some level of site-based accountability creates a more complicated management structure than in a purely regional system, in which all programs are managed on a regional basis. While adding to the organizational complexity, participants supported maintaining some level of site management. This management structure does at times provide some tensions within the organization and can be challenging to the executive. Participants from the executive team thought that being challenged by site and regional perspectives was generally beneficial. Maintaining site-based management is seen as increasing communication throughout the organization. Also, as one participant said, site-based management

> "is a structure that people in Alberta were used to for the last hundred years, and maintaining it has allowed the organization to remain operationally very strong, based on the historical continuance about how things were done."

Another important reason for maintaining some level of site-based accountability is the hospital foundations. Each major hospital site has its own health care foundation which helps raise money dedicated to that site. These foundations had relationships with these hospitals before the creation of Region A. By maintaining some of autonomy, the hospitals are able to maintain their relationship with their hospital foundation. The executive sometimes approach these foundations with larger capital purchase, usually for more cutting edge technology. The contribution of these foundations can be substantial. The goal is to balance elements of site-based and regional program management to ensure that the organization is working as efficiently as possible.

Clinical chiefs and program managers all report to the COO who has responsibility for their program area. Clinical chiefs also report to the Vice-president of Medical Affairs, who is the head physician for the region. *Figure 4.1* reviews of Region A's senior governance structure.

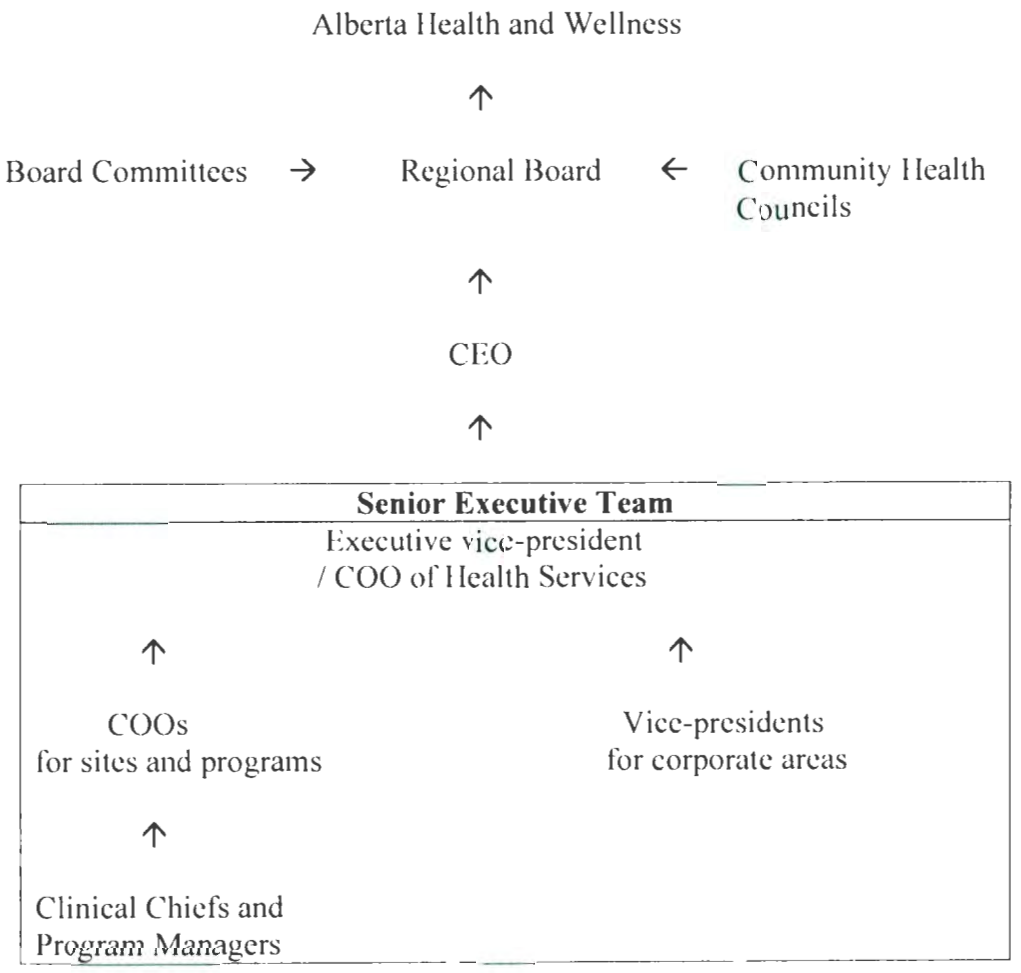


Figure 4.1: Region's A Decision Structure

Table 4.2 summarizes some of the information presented in the previous two sections about Region A's financial status and management structure.

Table 4.2: Region A Financial Data and Management Structure

Total Revenue	$2 billion
Revenue per capita	$2400
Increase in operate costs (2006-2007)	6%
Management Structure	Regional programs and site-based

4.3 Resource Allocation at Region A

The budgeting process starts by examining the previous year's budget. Zero-base budgeting, which tries to allocate all available resources without any consideration for how these funds were allocated in the past, is not used. Working from the previous budget, the executive would identify areas of change in the coming year for the region. The executive would identify any added cost pressures, such as inflation, population increases or changes in staffing levels. The executive also try and identify what changes need to be made across the region, e.g., how many new physicians need to be recruited, what changes need to be made in the number of beds, or what changes are needed to the amount of resources going into particular programs.

Operating and capital budgeting are two independent activities at Region A. They are supported by two different offices within the region's finance department. The operating budget and capital budget are also considered separately by the executive. There is some level of cross referencing within the two processes. A decision for which there are both

substantial capital costs and substantial operating costs would be linked to some extent. In the capital budgeting process, the executive would ask whether there are sufficient operating funds for the program. In the operating budgeting process, the question would be asked whether the capital costs are budgeted for. Although the budgeting occurs through two different processes, there has never been a case where either the capital or the operating side of a request gets funded and not the other. The processes are independent, but how priorities are set and how resources are ultimately allocated is generally the same for both budgets and is carried out by the same set of decision makers.

Region A has both site-based and program-based portfolios. In terms of budgeting, both are seen as programs with their specific costs. It is just that some programs are service based, some are facility based. Once funds are allocated to programs, they may further be allocated to the different sites which provide services. An example of how this type of program allocation to sites occurs is outlined in section 4.5 below, which deals with resource allocation within the Diagnostic Imaging program.

Within Region A, on the operational side, there has been a movement over the past few years towards activity-based budgeting. In activity budgeting, funds are allocated to a program to perform a specified amount of service activity. One participant described activity-based funding as essentially telling the programs "here's how much money [you have]... here's what we expect to deliver for this amount of money." Almost all operational budgeting at Region A is now tied to performance activity. Any major

variances in service delivery need to be explained to the executive by the program leadership team.

Sources of Requests for Additional Resources

Requests for more resources come to the executive from numerous sources. There are priorities the executive have themselves. Provincial initiatives or guidelines influence the priorities at the regional level, e.g., there are provincial guidelines around wait times for certain services. The region's board identifies priorities and strategic goals which the organization is to pursue. These board priorities will partially reflect the requests they receive from the Community Health Councils. Each program area has processes in place by which their COOs receive input from their program managers and their medical leadership about priorities within their specific program areas. There are "business driven" priorities. For example, some regions have responsibility to provide certain types of care to other regions which may influence priorities. Internal organizational pressures, e.g., wait time measures, other operational measures, staff retirements, influence priorities. Then there are issues around technology and service developments. These sources of priority requests are summarized in *Figure 4.2*.

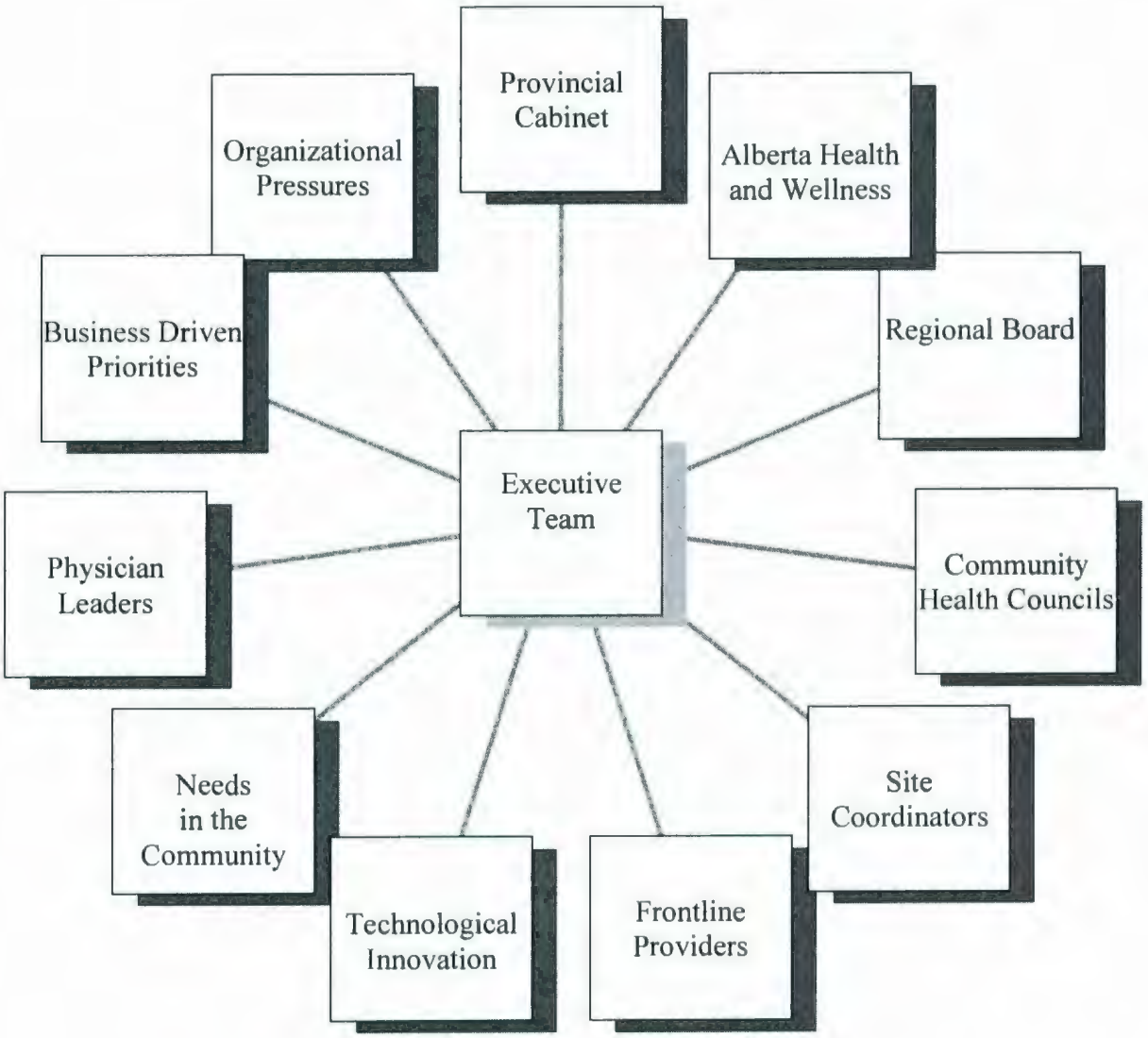


Figure 4.2: Sources of Requests for Increased Resources

The Budgeting Process

The budgeting process begins in either late August or early September. At the initial meeting, the executive table their priorities for each specific program in their portfolio.

The CEO would present any regional priorities, identified either by the region's board or provincial government. Physician recruitment for the year would be discussed, due to its impact on resources. The executive are also concerned with how resources are distributed across the sites within the regions. As part of the budgeting process, one or two programs are selected for review each year. The executive may adjust the budget of the program as to where the services are being provided, as opposed to the historic distribution. Sometimes these adjustments require the infusion of new funds.

Factors Influencing Budget Priorities

There would be some discussion throughout the priority setting process between the region's CFO and the representatives from Alberta Health and Wellness about the likely size of any increase in the region's budget for the coming year. Although the exact budget allocation for the region is not known until the provincial budget day, the executive usually have a good sense of the size of any increase ahead of time and use this information to help determine their request for resources. The budgeting process is a balancing of the requests the executive receives with what is likely to be the increase in resources for the coming year. As one participant said, it's up to the executive, with support of the finance department, "to actually distill all of those [requests] and come up with a game plan as to what we're going to try to do in the next year, recognizing that things come along even during the year that you [cannot predict]."

Numerous factors are considered by the executive in making the region's priority list, depending on the type of program under consideration. *Table 4.3* lists some of the types

of factors participants mentioned which influence priority setting. All of the participants identified clinical need or what is in the best interest of the patient as the most important factor in driving priority setting. Institutional impact was also mentioned as a key driving factor by most participants. Other factors relate to the numerous sources of requests and pressures on the executive, e.g., board priorities, provincial initiatives, needs identified by the different program areas. Sometimes gaps in service are identified, e.g., preparedness for avian influenza, which need to be addressed.

Table 4.3: Factors Identified as Determining Budget Priorities

• Clinical need / Best interest of the patient • Expected clinical need / Clinical trends • Cost / Institutional impact • Operational pressures (Waiting Lists / Wait Times) • Historical performance • Board priorities • Provincial guidelines • Provincial / National initiatives • New program areas / Gaps in service • Needs identified by frontline staff • Population changes • Technology / Changes in clinical practice • Practices at other centers of excellence • Staff issues • Staff expectations

Two other factors were identified by participants that are not often mentioned in the academic literature. The first relates to the conception of the regional authority held by its staff. Frontline providers have perceptions about the capabilities their health region

should have. As one participant said regarding a PET scan, "clearly, a region the size of ours [Region A] should have a PET scan." In large regional authorities, there are greater expectations to have the latest technology. Providers expect that a regional authority of a particular size should be able to provide access to a certain level and type of care. Although it is hard to measure, this conception of what capabilities a regional authority should have likely has a powerful influence on priority setting, especially at the departmental level where providers are more involved.

The second factor relates to the ability of requests on the budgetary agenda to ultimately get filled. There is a sense that once a request gets on the agenda, they will at some point get funded. There are a number of reasons why requests which remain on the agenda may ultimately get filled. It could be that there is enough merit for the request to be maintained on the agenda, but it is simply a question of there being higher priorities. The request may rightfully become the organization's highest priority in later budget cycles, once preceding higher priorities have been fulfilled. Yet it may also be the case that a request gets filled partly out of a sense of budgetary fatigue, where the issue is raised so often that it finally gets seen as an issue which needs to be addressed, outside of the merit the request may have.

For new projects, a fairly thorough case needs to be made to the executive before it is approved. The case would include an account of the project's total impact on the organization, including total cost, purchase price of equipment, cost of service contracts, staffing costs, setup costs, required renovations, where the program and equipment are

going to be located. Most importantly, the case has to be made in terms of its impact on patients. Other information may be required depending on what concerns the executive have. Requests for new programs or major expansions of an existing program thus usually require a substantial amount of documentation.

With the release of the provincial budget, usually in March, the region finds out what additional resources it will receive in the coming fiscal year. The total amount requested for additional services is always greater than the amount of addition resources the region can expect to receive. For example, for the 2006 – 2007 budget year, Region A received only around 35% of the amount of additional funding it requested.

At the regional level, the second phase of the budgeting process is to prioritize the initial list of requests in terms of the amount of funds actually received. Again the executive tries to determine, from a regional perspective, which requests are most important to fulfill. As one participant said,

> "it's not an exact science but our process continually evolves so this is how we're doing it this year and it's built on previous years. It always gets a bit better and more refined; but, remember, we're still a young organization. We're only 10 years old - very complex and just beginning to have available the kind of information that we need to help us make these kind of decisions."

Again each member of the executive makes their case for increases in their area of responsibility. The executive as a group work until they come to a consensus about how funds will be allocated across the different programs and generally within programs.

Only after the executive have determined the budget for the region do the programs find out what level of funding they will receive and what new programs have been approved. The executive would also identify what increased level of activity it expects the program to produce with the new funds. *Figure 4.3* provides an overview of Region A's priority setting and resource allocation cycle.

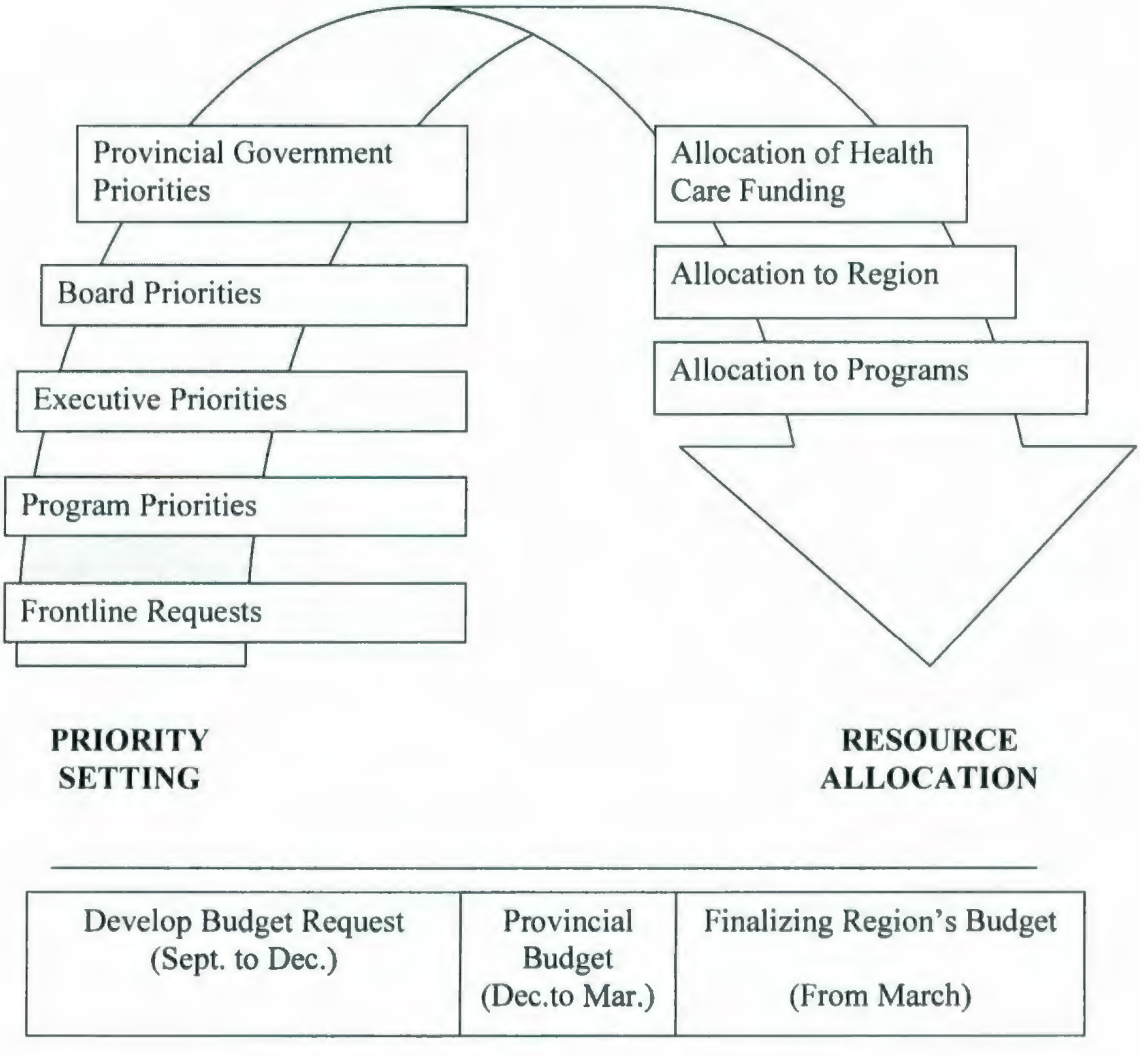


Figure 4.3: Priority Setting and Resource Allocation Cycle at Region A

Region A's finance department conducts mid-year budget reviews to determine how the organization is performing financially, to determine any problem areas and try to correct them before the beginning of the next budget cycle.

Procurement

Region A has a fairly sophisticated procurement process in place. Procurement is standardized across program areas. As one participant points out, "we're spending public dollars so we are required to have processes which [can pass] under the scrutiny of the Auditor General and so our processes for that are very clearly laid out." All purchasing is managed through a contracting office in the department of Materials Management. While the contracting office manages the entire procurement process, the physicians and managers in the program areas are closely involved.

Once the need for a piece of equipment has been identified and a budget allocation committed to the purchase of new equipment, the contracting office contact the leadership team of the program the equipment is for to begin the planning stage. End-users would determine the required specifications for the new equipment. Based on the input of the end-users, the contracting office would develop a request-for-proposal (RFP) and forward it to the appropriate vendors. Once RFPs have been received, the contracting office would send the clinical and technical aspects of the RFPs to the program leadership team for them to assess the different options and shortlist which equipment they find acceptable. The contracting office retains the financial parts of the RFPs. Once the

program team has identified the options which are acceptable from a technical and clinical basis, the contracting office reviews the financial details of the RFPs for the acceptable equipment. The contracting office would then consult with the program leadership team to validate the value of the different options. A recommendation would then be made to the CFO to purchase a particular piece of equipment, based on its value and technical acceptability. *Figure 4.4* outlines the basic steps in the procurement process.

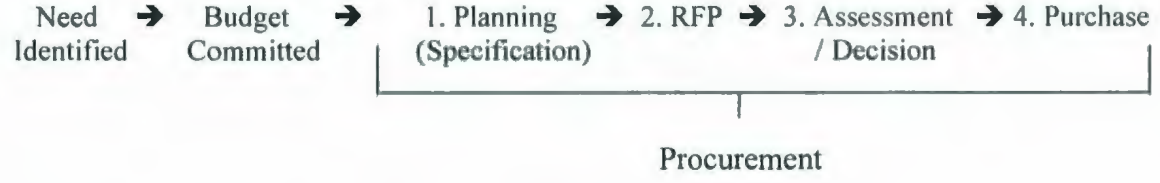


Figure 4.4: The Procurement Process

4.4 Resource Allocation Issues at Region A

The executive of Region A are ultimately responsible for all the resource allocations made within their region. In determining the region's budget, the executive would allocate resources across the different program areas. It would also make program level decisions which have a substantial impact on the region's operations or have substantial costs associated with them. For example, large shifts in program expenditures would require executive approval. The executive may also decide on any issue which is particularly contentious and in this way the executive could be involved in decisions concerning the care individual patients receive.

On one level, the executive's decision making can be described as closed-door / top-down, in that it is only the executive who makes the decision and its decisions are then imposed on the other levels of the region. But the budgeting process is also very open in terms of the level of input the executive receive from a range of stakeholders, including frontline providers, program managers, their board, the Community Health Councils, and the provincial government. While the executive make decisions which are ultimately imposed on their entire organization, there is a real attempt to bring in as many perspectives as possible in making these decisions. There is then some level of inclusiveness to the executive's decision making.

4.4.1 Region A and Need

At the executive level, need was mostly determined by the reports of staff and other stakeholders. Internal data, particularly around wait times, was also mentioned as another indicator of need. No participant reported the use of formal needs assessments, even for setting general regional priorities.

4.4.2 Region A and Evidence

Decision makers felt that Region A does a fairly good job of using evidence in decision making, although there is some variation across programs. As one participant said, the leadership of a program "wouldn't be out there suggesting we should do it unless there's good documented proof that it is viable." The amount of evidence required by the executive would depend on the type of procedure under consideration. As another

participant said "there has to be a lot more documented evidence before we'll go and find new modality; but to use something added on the same modality, I think that level of documentation is much less." The level of evidence required would also be affected by the executive's level of familiarity with the technology, the issues surrounding it, its likely institutional impact and the cost associated with it. Sometimes procedures go ahead without proper evidence, but the usage is seen as part of being an academic research centre. It is accepted that in an academic research environment, there are going to be procedures attempted which do not have to have significant evidence behind them, for part of the job of an academic teaching institution is sometimes to help produce the relevant evidence. This role as an academic teaching environment needs to be balanced with the goal of being an evidence-based organization. This type of investigative adoption of new technology would usually be done on a small scale first and then expanded if it is shown to be beneficial. Most times this decision to expand an innovative program would include, if not a formal cost-effectiveness study, at least some consideration of the costs associated with a new procedure. At Region A, there is currently a review of all programs being conducted looking at best management practices, including the different programs' use of evidence. Also, as described below, Region A has recently established an Office of Health Innovation to help coordinate some of the evaluation and assessment work of new technologies.

The use of evidence also touches on information management within the organization. Most decisions are driven by internal operating data. One participant suggested that there is a need to improve the use of the information they have in order to make better

decisions. The improved use of internal data requires capturing the internal data and presenting it in a way which is useful to decision makers. One participant rated Region A use of internal information as "okay, but clearly there's ways that we can improve."

4.4.3 Region A and Cost

In terms of cost, participants focused almost executively on budget impact. There was little consideration of cost-effectiveness mentioned in any of the discussions. The use of cost-effectiveness information in making funding decisions may increase with the new Office of Health Innovation which aims to conduct more internal evaluations before programs and procedures are started. For Region A, what was in the best interest of the patient was reported as a more dominate consideration than what would be the most cost-effective means of treating the patient.

Costing is primarily done using historical internal data from the programs. Region A also has a department of finance which keeps track of the financial expenditures. This department conducts bi-annual reviews of program spending to ensure that cost estimates are not missed; or if they are missed, financial discrepancies can be addressed earlier on.

4.4.4 Region A and Accountability

As a government agency, Region A is bound by numerous government regulations which are meant to help ensure accountability to the public. In accordance with the *Government Accountability Act* (1995) and *Regional Health Authorities Act* (1995), Region A's board releases publicly available annual reports and three-year strategic business plans. These

reports are written by the management of Region A, but are approved by the board. The reports set out the financial performance of the region, their operational performance, and the strategic goals of the region going forward. The budgeting and procurement processes at Region A are reviewable by the provincial auditor general and are therefore well documented and done in accordance with wider government guidelines. Because of the boards and the CEO's positions are ultimately dependent on the Minister of Alberta Health and Wellness, who is elected, there is also general political accountability through the provincial election process.

Provincial regulations require that Region A have Community Health Councils, which help present the views and concerns of local communities to the board. These Community Health Councils, as described above, are appointed by the board themselves. The Councils sometimes do small surveys in their communities or hold consultation sessions with local citizens. These Councils seems to be the full extent of public participation in decision making at Region A. The role of the public participation at Region A is limited to being consultative.

Within Region A itself, discussion around accountability was tied to programs balancing their budgets and meeting activity targets. Another benefit of activity-based budgeting is that it focuses operations on performance indicators. The improved use and carefully monitoring of these performance indicators, as one participant said the "horrendously careful monitored at times," allows the region to show the connection between where funds are directed and output. As another participant said, "if somebody gets an extra

million dollars to revamp their day surgery so that they can extend their hours at their day surgery clinic and allow that many more OR cases to go through, then they bloody well better show that there are more cases." This focus on measurable results is driven both by a concern to use resources efficiently, but also to clearly show what resources are being spent on.

The role of people was also identified as important factor for ensuring accountability. As one participant said, it is important that "the leadership of people being consistent, being forthright and just coming in and doing the best job that they can." This participant went on to say that " it's not always perfect and, you know, we do make mistakes; and when that happens then, hopefully, we catch it early and then we do a course correction. We make a change. We pause and then we take another run at it." In terms of accountability and resource allocation generally, as another participant said "I think at the executive level and having Vice-Presidents or Chief Operating Officers that have the skills set in the leadership and the abilities to do this work is key." Other participants also seemed very cognizant of their ultimate responsibility to the public and of their responsibility to use public money wisely.

Measures to ensure accountability at Region A can be seen then as being both process-based and character-based, with a good deal of government oversight and transparency, but little direct public involvement.

4.4.5 Region A and Ethics

There was little direct discussion of the ethical aspects of the resource allocation decisions at Region A. Participants identified a number of its corporate values, including the "wise use of resources." Region A does have a Clinical Ethics Committee, which sometimes evaluates clinical policies from an ethical perspective. Some of the hospital sites have their own ethics committees. Region A sometimes brings in outside ethical expertise. While there is a good deal of concern for ethics within the region, the region does not appear to have explicitly looked at the allocation of resources, especially at the executive level, solely from an ethical perspective.

4.4.6 Initiatives for Improving Resource Allocation at Region A

There are a number of initiatives currently underway within Region A which participants report as improving the region's ability to allocate resources more efficiently.

Better Physician Recruitment

Labour costs and staff recruitment have a major impact on how resources are allocated within a regional health authority and on future health costs. In particular, physician recruitment can have a fairly substantial impact on resource allocations. Medical staff come at a high expense, both in terms of salary and required support, e.g., need for support staff, requests to purchase new equipment or to provide new services. It is also difficult to reduce staff levels once people have been hired. Another problem with physician recruitment, as reported by one participant, is that it is hard to get good comparisons with what is happening in other regions, so that it is difficult to benchmark

the costs associated with new physicians. Region A is currently trying to improve how it costs physician recruitment. The vice-president of medical affairs, the COO of the site involved, and the medical director for each site now review the impact of physician recruitment on a site by site basis. Frontline clinicians are also being brought in more to help with the costing of physician recruitment.

Electronic Health Record (EHR)

Region A has established and is expanding its electronic health record system. The system allows authorized staff to have real-time access to parts of the patient's medical record. Information contained in the system includes personal registration information, tests results, current medications, known allergies, operations and surgeon reports. The system also links to the provincial Pharmaceutical Information Network. Next to being a tool for ensuring the more efficient use of resources, e.g., avoiding the duplication of tests, participants report that the EHR can be used to give the management team better information on system usage and help formulate that information is in a form which is more useful to decision makers.

Office of Health Innovation

In spring of 2003, Region A established an Office of Health Innovation. The Office of Health Innovation has two main goals. The first is to evaluate some technologies before they get established across the region. The second is to act as a point of contact for other organizations concerned with the development and evaluation of new health technologies. This would include groups like the Alberta Heritage Foundation for Medical Research,

CADTH, the National Drug Review, etc. This point of contact can also be used by private sector companies looking to work with the region to develop new products. The primary concern would be to work with Alberta-based companies.

The plan is for assessments to be carried out by the clinical staff, with support from the Office of Health Innovation; or the Office may take on the assessment itself. The Office also hopes to be more forward thinking than other HTA units. The assessment would involve checking with experts, benchmarking with other leading institutions, rather than just relying on published research findings. Any existing research evidence would also be evaluated. These components are all part of the initial assessment, which can be used to help decision makers decide whether to invest in the new technology.

The Pharmaceuticals and Therapeutics Committee

Region A has a pharmaceuticals and therapeutics committee which reviews high-cost drugs that may be used by the region. This committee looks at both the clinical efficiency and the financial impact of new treatment options. The clinical efficiency and the financial impact are considered by different groups. As one participant said, this is so "you don't have your doctors making advice on pay or no pay. They just say, yeah, it works for this, this, this and this. It's better than the old one or it's an alternative to surgery or whatever." The finance side of the committee would then consider whether the level of benefit is sufficient to justify the investment.

4.4.7 Overview of Resource Allocation at the Executive Level of Region A

In order to assist in the comparison of decision making across the regions, the information presented in sections 4.4 to section 4.4.6 is summarized in *Table 4.4*.

Table 4.4: Overview of Resource Allocation at the Executive Level of Region A

Resource Allocation Decisions	Across program areas; within programs and occasionally, in clinical circumstances. Inclusive, but ultimately closed-door, top-down.
Need	Determined by staff, stakeholder reports and internal data.
Evidence	Varies depending on issue under consideration. New and innovative technologies usually require a good deal of information. Sometimes innovative procedures are allowed in order to evaluate them. Internal data and expert opinion are important types of evidence.
Cost	Primarily concerned with budget impact, determined primarily by internal data.
Accountability	General government structure; annual reports; use of activity-based program budgeting, the character and skills of the region's leadership team, and meeting budget targets.
Ethics	Ethical concerns consider, but no ethical audit of the allocation of health care resources.
Innovations for Improving Resource Allocation	• Better physician recruitment • EHR • Office of Health Innovation • The Pharmaceuticals and Therapeutics Committee

4.5 Resource Allocation within the Diagnostics Program[21]

At Region A, endovascular coiling and MRI are both budgeted through the Diagnostics Program. It is useful to begin our discussion of resource allocation in these two areas by examining how resources are allocated within this program generally.

[21] The exact name of the program is not used to help ensure the confidentiality of the region.

Decision Structure

The Diagnostics Program is responsible for providing diagnostic services throughout Region A. The Diagnostics Program runs over 200 major pieces of diagnostic equipment across numerous sites. They have capabilities in most modalities of diagnostic imaging. There are around 100 radiologists in the Diagnostics Program, making it one of the largest diagnostic imaging departments in the country.

The Diagnostics program is led by a Regional Administrative Director for Diagnostics and a Clinical Director. The Administrative Director reports to the COO for Diagnostics, who is a member of the senior executive team. Although Diagnostics is a regional program, it is delivered at the different hospital sites. The leadership team of the program is supported by program coordinators at each site. The leadership team is also supported by a number of liaison groups. These liaison groups are mostly organized around different modalities, e.g., MRIs, CTs, ultrasound. There is also a liaison group responsible for quality, which will occasionally review protocol procedures across the program. These liaison groups would consist of site program coordinators, some management staff and frontline radiologists. These groups meet on a fairly regular basis. Their discussions would be focused on very practical issues related to their specific modalities, e.g., how to standardize specific procedures across all sites. These liaison groups would also identify needs relating to their specific modality to the Administrative Director and Clinical Director. The program leadership also bring frontline staff directly into the decision making process when they are required. For example, frontline staff

would be brought into discussions about the purchase of new equipment. Frontline staff is also encouraged to identify changes in usage trends or ways of improving service to the attention of the program's leadership team. Any staff member can informally identify concerns to the leadership team. The decision structure aims to allow for fairly good communication from frontline staff to the program leadership, which is sometimes challenging given the size of the program and the fact that it is spread across numerous sites. The programs decision structure is outlined in *Figure 4.5*.

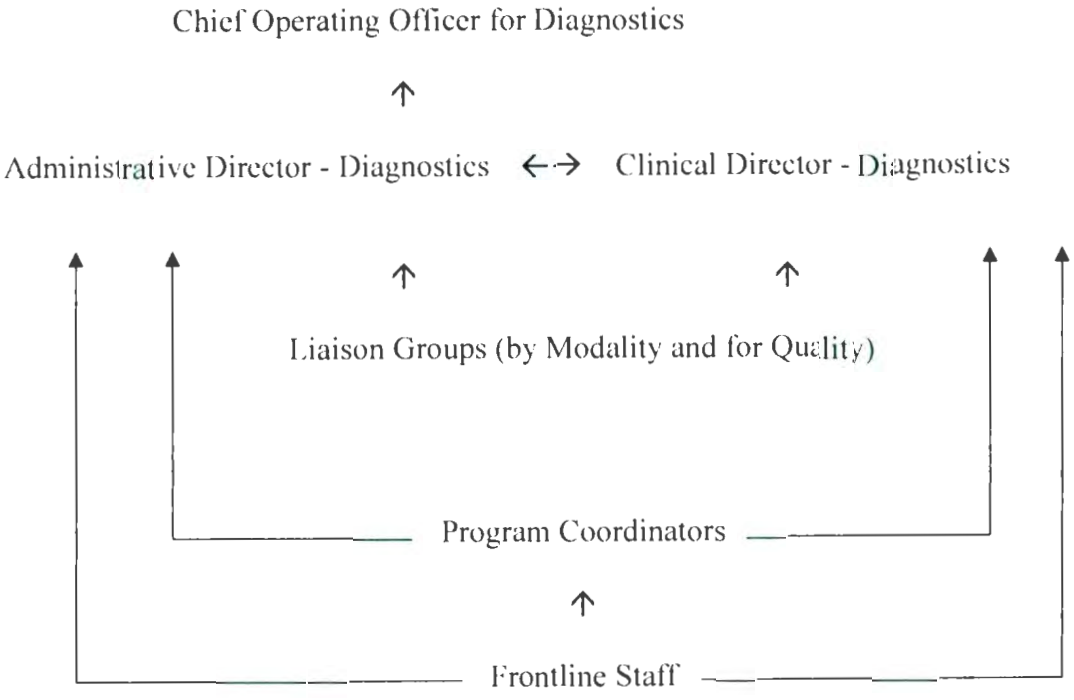


Figure 4.5: Division Making Structure of the Diagnostics Program

Priority Setting

As one participant said, priority setting within Diagnostics focuses on trying to determine what is "reasonable to ask" for within Region A's annual budgeting process. The program leadership team listens to requests from radiologists, examines the current operational situation, e.g., wait times, and considers the region's likely budget environment. Budget requests are greatly influenced by previous budget allocations and service levels. Generally, funding would follow the pattern of previous years. Priority setting would only be done around expected increases in funding. The Administrative Director and the Clinical Director would determine the program's budget priorities and submit them to COO for Diagnostics. There would be ongoing discussions between the Administrative Director, the Clinical Director and the COO before a priority list is put forward to ensure its acceptability to the COO.

In setting priorities for the coming year, Diagnostics puts forward both a capital budget and an operational budget. Although these are two separate budgets, Diagnostics is moving more towards making requests which reflect the total cost of doing business, including cost items such as capital costs, operating costs, warranties and service contracts. In making requests for new purchases like an MRI, which require both an expansion of operational costs and capital expenditures, there would certainly be some cross referencing between the two budgeting process. The operational side of a request would not get filled without the capital purchase also getting approved; and visa versa. For the operational budget, budget allocations are tied to activity levels, as they are for all programs at Region A. Increases in resources are tied to increases in the expected activity

for the coming year. For example, a certain amount of money could be directed to Diagnostics to do a specified increased number of MRI scans.

The COO for Diagnostics would bring Diagnostics requests to the executive. The request represents what the COO feels is a reasonable investment in diagnostic equipment and what activity levels there should be to meet the expected demand for the coming year. This request would be based on current activity levels, historical performance and prospective growth, wait lists, and priority programs within the region. External factors would also be considered, such as the expectations arising out of provincial and federal government initiatives and provincially established service targets. Sometimes the evidence supporting the clinical effectiveness of a new program may also be presented to the executive. This inclusion of clinical evidence is an increasing trend within Region A. It is the opinion of more than one participant that the current diagnostic modalities are essentially proven and well known technologies, so that there is little need to present evidence to support their effectiveness within the budgeting process.

At the conclusion of the region's budget process, the leadership of Diagnostics will be advised whether their budget has been changed, whether any capital purchases have been approved, and of expected changes in their activity levels. The budget allocation will then be allocated by the leadership of Diagnostics to the various hospital sites within Region A which provide diagnostic services.

Once the decision has been made by the executive to buy a new piece of diagnostic equipment, like an MRI, there is a published protocol which is used to guide the procurement process. Diagnostics would work with the Department of Materials Management to set up a team to develop a RFP. This team would involve people from the Materials Management and frontline staff from Diagnostics. As one participant said,

> "in terms of an imaging perspective, [when developing an RFP] we always work in a team ...because no one person of it has all the information, ...I think that's sometimes unrecognized outside of imaging - how complex making sure that you get the right pieces to the equipment is and how important it is for Imaging [Services] to be in the process from beginning to end."

The RFP would specify the clinical and technical requirements wanted by Diagnostics. The rest of the process would follow the same procedure for procurement described above in the section 4.3.

4.6 Endovascular Coiling in Alberta

Endovascular coilings have been performed at Region A for about eight years. No estimate for the number of patients annually receiving endovascular coilings at Region A was given. The patient population was described as fairly stable from year to year and small. In 2005, the region began a formal endovascular coiling program. Previously, patients were primarily coiled when the neurosurgeon felt that the patient was too ill to undergo open brain surgery. Now interventional radiologists and neurosurgeons are trying to be more proactive in determining which patients would be best served by either coiling or clipping. In setting up a formal program, the region hired an outcomes nurse

and established a follow-up clinic to monitor patients. The new program allows for a single point of entry for patients who need endovascular coilings so that they can be better followed through the system.

The need for a formal endovascular coiling program was identified internally by frontline staff. Starting this program was a multi-year initiative. While Diagnostics did not know exactly when they were going to get the go-ahead from the executive to implement the program, endovascular coiling had been moving in the direction of establishing a program for sometime. As one participant remarked, "so part of being successful [in establishing an Endovascular Coiling program] is probably [the result of] having the stamina."

There were a number of issues around the development of an endovascular coiling program. There were some political and jurisdictional issues between the interventional radiologists and neurosurgeons regarding the management of cases. Part of the problem related to the way the two sets of physicians are paid. Neurosurgeons can bill for the clipping of aneurysms as a surgery. The radiologists do not have the same billing options available to them for coilings. Radiologists also do not have hospital beds and cannot admit patients in hospital. The question became whether the patients should be admitted through the neurology department even though they were primarily being treated by the interventional radiologist. One participant pointed out that this is part of a wider problem as innovations in radiology begin to challenge the traditional way medicine has been delivered and managed. While the program has now been established, participants admit that there are still some operational details which need to be worked out between the

interventional radiologists and neurosurgeons to make the management of patients run more smoothly. Both groups supported, however, the creation of an endovascular coiling program at Region A.

4.6.1 Resource Allocation for Endovascular Coiling

The budgeting for Endovascular Coiling is set through the Diagnostics program as part of Region A's annual operating and capital budgeting processes. One participant described the budgeting of the endovascular coiling program as being "quite straightforward." Clinical need is the driving factor for the endovascular coiling budget. The budgeting process begins by estimating the likely patient population needing coils in the coming year. This estimate would be based on the expected annual number of cerebral hemorrhage / aneurysm cases and the percentage of these cases which would likely be coiled. The previous year's usage would be looked at as a guide. Any trends in usage over a period of years would also be examined, e.g., is there a higher percentage aneurysms patients receiving coils? The budgeting in this area is fairly straightforward because the population requiring major treatment for cerebral hemorrhage / aneurysms is fairly stable from year to year, which therefore allows for a fairly accurately prediction of the case load for the coming year. The executive agree to budget for a certain number of coilings cases annually as part of Diagnostics annual operating budget. This budget allocation is supposed to be sufficient to meet the entire need for endovascular coiling in the region. It could be said that the program is thus fully funded, in that the budget is set to meet the total demand. If their case estimate for the year is missed, Diagnostics will look at the reasons why their estimate was off and make a revised estimate for the

following year. In some cases, an explanation of why the estimate is off would have to be made to the region's finance department.

From the point of view of the region, the choice to either clip or coil a cerebral aneurysm should be cost neutral. But at Region A, this is not the case. From a budgetary point of view, cerebral aneurysms have been traditional treated in the neurology and surgery departments. Coilings are done by radiologists. Ideally, the cost for providing the coiling should be transferred from the neurology and surgery department to the Diagnostics program. In order for this to occur, neurology or surgery would need to not use the resources, e.g., staff, O.R. time, for other procedures. This has not occurred. Because of wait times for other services, other surgery patients use the resources which were saved by the cerebral aneurysm being treated by the radiologist. From the regional point of view, coiling increases the cost of Diagnostics, but do not show offsetting cost savings in other departments. There are gains, however, to the region in terms of lower wait times for OR procedures.

Endovascular coiling requires two main capital expenditures. The first is for the initial inventory of coils needed to be in place before performing the procedure. Given the length of time Region A has been performing endovascular coiling, none of the current participants were involved in the original discussion about the purchase of an inventory of coils. The cost of replacing coils is included in the cost provided for performing each case.

The second major capital purchase for endovascular coiling is of a bi-plane angiograph. Region A's bi-plane angiograph was purchased solely through funds raised by a charitable foundation. The purchase of a bi-plane angiograph was thus outside the capital budgeting process.

4.6.2 Resource Allocation Issues around Endovascular Coiling

From a resource allocation perspective, one of the interesting aspects of endovascular coiling at Region A is that there appears to be no rationing of the service. Physician opinion of what is in the best interest of the patient seems to be the driving, if not the only, factor taken into consideration. As reported by one participant, if a patient is best served by endovascular coiling, they receive it. Although the program is funded through Region A's budgeting process and annual activity levels set, for practical purposes, decision making in this area is solely determined by physician mirco-level, clinical circumstance, decisions. Because the decision to coil or not is made by the consensus of a team of physicians, decision making at the micro-level also seems to be an example of collegial decision making. Having already addressed the capital costs and the human resources issues related to coiling, for Region A, resource allocation in this area has primarily become an exercise in estimating demand for the coming year, which is simplified by the fact that the annual patient population is fairly stable.

4.6.3 Endovascular Coiling and Evidence

Research evidence for the effectiveness of endovascular coiling was not considered. Given that the procedure has been performed at Region A for a number of years, all the

participants interviewed on this topic felt satisfied that the benefits of endovascular coiling have been clearly established.

The main resource allocation question facing Region A for endovascular coiling is how many coilings to budget for in a given year. The decision to coil an aneurysm or not is a joint decision of the neurosurgeons and the interventional radiologists. The researcher did not have the opportunity to talk to either a neurosurgeon or an interventional radiologist at Region A to discuss how cases are chosen for coiling or not. It is thus not known what evidence is used in making these treatment decisions. From all indications, this decision is made by a consensus of the team of physicians based on their professional opinion of what is in the best interest of the patient.

In terms of budgeting for endovascular coilings, the key from the perspective of Diagnostics is to determine the expected number of cases in the coming year. Internal program data is used to identify the number of cerebral aneurysms / cerebral hemorrhaging cases performed in previous years; the percentage of these cases which were treated by endovascular coiling; and any trends in treatments for these cases, e.g., is an increasing percentage of patients being treated by coiling. This data is used to predict the expected number of cases for the coming year.

4.6.4 Endovascular Coiling and Cost

Participants repeatedly said that the decision whether to clip or coil a cerebral aneurysms or cerebral hemorrhaging cases was based solely the clinical opinion of the medical staff.

Cost differences between the two procedures were never considered. It follows that there is seemingly no consideration of cost-effectiveness of the different procedures in making resource allocation decisions at Region A. Costing for budgeting purposes is based on internal costing data, adjusted for any known increases in operational costs for the coming year.

4.6.5 Endovascular Coiling and Accountability

There are no special accountability measures for the endovascular coiling. Physicians are given the full responsibility to make what they see is the best decision for their patient. Oversight for the program is provided through the leadership team of Diagnostics and through Region A's operating and capital budgeting processes.

4.6.6 Endovascular Coiling and Ethics

Because there is no rationing of service in this area and there are no restrictions on who has access to the service, beyond the restrictions placed on who is eligible for care within the region, many of the main ethical concerns about resource allocation are not applicable. There is no formal policy in place not to provide services to particular types of patients, e.g. elderly. It could not be determined by this researcher whether such factors are taken into consideration by the frontline staff when determining how best to treat a patient. It would seem, however, that this would be less of an issue for coiling as opposed to clipping, which is physically more demanding on the patient. There is a wider ethical concern about why there appears to be no rationing in this area of care while other areas of care there is rationing. Presumably it has to do with the seriousness of the

patient's condition; the small number of patients needing the procedure; in some cases, the lack of other viable treatment options; and the relatively low costs of the procedure compared to other treatment options, especially once the main capital costs are addressed.

4.6.7 Overview of Endovascular Coiling

Table 4.5 provides overview of how the six component elements are handled by Region A's endovascular coiling program.

Table 4.5: Overview of Endovascular Coiling

Usage	Small, but stable patient population.
Resource Allocation Decisions	Clinical circumstances, collegial. No rationing of care. The program's leadership team allocated funding to establish a formal endovascular coiling program.
Need	Determined by internal usage data.
Evidence	Clinical circumstances of patients. Seen as an effective treatment.
Cost	Analysis of internal costing and usage data.
Accountability	No measures specific to program.
Ethics	Few ethical issues.

4.7 MRI in Alberta

There are currently 19 MRI machines operating within the public health care system in Alberta (Alberta Health and Wellness website, 2007). In 2005, Alberta's scan rate was the highest in the country at 36.6 scans for every 1,000 people in the province (CIHI,

2005). The average cost of providing a MRI scan within the public health care system is currently $535 (Health and Wellness website, 2007).

Provincial committees have previously attempted to develop a provincial strategy around diagnostic imaging. These committees focused primarily on MRI and CT. In 2001, the province's Imaging Advisory Committee (2001) released a report which examined the current state of MRI; modeled future demand, machine capacity and human resource availability; and made recommendations aimed at allowing the province to meet future MRI demand. Among the Imagining Advisory Committee's recommendations were for the province to improve access, develop standard province-wide guidelines around MRI usage, to train more MRI technicians and to maintain a MRI scan rate of 24 scans per 1,000.

Although the provincial government is committed to the scan rate of 24 scans per 1,000 and to acting on some of the Imagining Advisory Committee's other recommendations (Alberta Health and Wellness, News Release, 2001), not much came of the Committee's report after its release. One respondent reported that "unfortunately, not a lot of that [from the Imaging Advisory Committee] has translated into actual action; and in the end, we always come up to the same issue - significant investment required to achieve what the preferred vision of the future is." This investment was identified as being needed to address the issues around the recapitalization of equipment and wait lists. The attempts at an overall provincial MRI strategy did not come with targeted funding for increasing

imaging capacity. Without targeted investment coming from the province, most of the key decisions regarding MRI capacity are made by the individual health regions.

There are not any current attempts to develop a provincial MRI or diagnostic imaging strategy. The Imaging Advisory Committee also no longer appears to be in existence. The current situation is one where it has fallen to the regions to determine their MRI needs, but MRI usage and wait times measures are closely watched by Alberta Health and Wellness. There are agreements between the regions and the provinces regarding wait times for MRIs. Alberta Health and Wellness publicly reports updated wait times and number of MRI scans by region through the Alberta Waitlist Registry website (2006). The province has also made a number of targeted investments in the area of MRI to help address the wait time issues over the past few years. These investments have included the purchase of new machines and paying private companies to perform scans in order to address waiting lists.

MRI in Region A

In 2002, the provincial government gave the regions substantial funding targeted for new MRI machines. Region A received three new machines. These machines more than doubled their MRI capacity but, because of pent-up demand, one participant reported that wait times actually tripled. Physicians who would not order a MRI scan for a patient given what they saw as significant wait times, with the new machines, began ordering the tests. The participant said it is not that this was illegitimate application of MRI by the physicians, it is just that the system could not handle all of the legitimate uses of the

technology, and this legitimate demand is going to grow as the capability of the technology expands. Region A currently performs around 35,000 MRI scans annually across its various sites.

4.7.1 Resource Allocation for MRI

The decision whether to expand MRI capacity within a particular region is primarily made by the regional authorities themselves. This is especially true for the larger health regions, who have large enough annual budgets to handle purchasing an MRI without having to request additional funds from the province.

The budgeting for MRI is done through the Diagnostics program as part of Region A's annual operating and capital budgeting processes. Capital requests for MRI would be brought forward to the executive in one of two cases. The first is when it is deemed that an existing MRI machine is outdated and needs to be replaced. The second is when an additional MRI is needed in order to increase the region's MRI capacity. Capacity increases would be recommended when existing MRI capacity cannot meet the desired operational output. Usually the executive would be aware of the need for a new MRI well before a request is brought forward as part of the budgeting process. There has also been some work done by Diagnostics, in cooperation with a business school in Alberta, to model future MRI demand for the region. Although fairly preliminary, this work is meant to help bring some long-term planning to MRI capital expenditures.

In terms of current MRI capacity, there are plans to expand the hours of operations of some of the MRIs in the region. Diagnostics will also probably soon request another MRI machine. This is an issue which is currently being discussed with Diagnostics' MRI liaison group. Outside of this possible request for another MRI, one of the Region's charitable foundations has an on-going campaign to purchase an Intra-operative MRI.

On the operational side, Diagnostics submit a request annually for funds to perform a specified number of MRI scans for the budget year. MRI scans fit well with the activity-based operational budgeting approach used by Region A. Diagnostics know the number of scans it is currently doing with five machines running at a set number of hours. It can roughly determine their remaining MRI capacity, i.e., the number of increased scans they can perform on their existing five machines. Based on its current wait list, Diagnostics can also determine the number of scans required to achieve their present wait time target. The region allocates a set amount for each MRI scan, regardless of its level of difficulty.

There are numerous factors which impact on MRI usage. In determining the appropriate budget request for MRI, Diagnostics try to identify these factors and estimate their likely impact. As one participant said, "you keep layering what kind of activity does each of those factors translate into." The budgeting begins with the previous year's allocation. As a baseline, Diagnostics would hope to do the same number of scans, in the same areas, as the previous year. There are numerous factors which need to be considered in determining a reasonable request for increased activity. There is significant population growth in the region; the population is aging; there are board priorities, e.g., the creation of additional acute care beds, which will increase the demand for MRI; demands from

radiologists. There are issues related to technological and software improvements which expand the capabilities of the equipment. More capabilities mean that there are more cases which could benefit from an MRI. In other words, increased capabilities equal increased demand. Other significant drivers for MRI are wait times and waiting lists. Requests for increased resources for MRI would include measures aimed at meeting provincially set targets for MRI wait times. All of the factors identified in the participant interviews as possibly affecting the requested amount of MRI activity are listed in *Table 4.6.*

Table 4.6: Factors identified in determining MRI Requests

• Historical performance • Clinical need • Expected clinical need • Operational pressures (waiting lists / wait times) • Provincial / regional guidelines • Needs identified by frontline staff • Impacts from other programs • Impact of board priorities • Existing MRI capacity • Status of current MRI scanners • Population changes • Technology changes • Changes in clinical practice regarding the use of MRI • Practices at other centers of excellence

One of the unique issues for Diagnostics is that MRI usage often gets impacted by activities in other parts of the organization. At Region A, they have stopped trying to deal with these external impacts as once off or specific issues outside of the budgeting process.

Expansions in other areas of care which will impact on Diagnostics are identified as additional cost drivers as part of their normal budget submission. For example, as the province and the region focus on expanding stroke or cardiology care, investments in these areas will be identified by Diagnostics in their budget submission as factors increasing MRI demand. If there is significant growth in a program which impacts on Diagnostics, the program may still make a special request outside of the budget process to address that area.

Taking the current activity levels, wait lists, regional priorities, historical performance, growth, etc., the COO for Diagnostics would make the case to the senior executive team for a certain increase in the MRI budget to allow for a set number of more scans. The case made to the executive would be very much based on the factors which Diagnostics identified in determining their requested amount of activity. The executive are not likely to approve the total requested increase, but rather only a portion of the request.

Allocation of MRI Activity across Sites

Diagnostics is a regional program. Region A, however, still has a heavy site-based focus. With MRI, there has been a move to look at it more as a purely regional service. Diagnostics are in the process of developing a centralized booking system, so that requisitioning physicians can either request a specific site or the first available slot in the region. Still, once the annual budget is given to the program, the budget needs to be allocated by Diagnostics across sites. If the executive approve 5000 more MRI scans for the region, it still needs to be determined which sites will these additional scans be

performed at. It also needs to be determined how much extra funding each site is going to be given to do those scans. Factors which are considered include whether there is still equipment capacity at particular sites. If a site does not have additional capacity, it cannot do additional scans. If there is still capacity, the question becomes whether to pay that site the full cost of a scan, or is only a variable cost given to that site, based on the assumption that they still have staff capacity to do the scans without having to incur higher staffing costs. There are productivity differences between sites depending on the type of cases which are being done. Although the region pays Diagnostics the same amount for each MRI scan, pediatric cases take longer; more acute patients take longer. There are variations in productivity for MRI machine and for MRI techs. These variations need to be factored in when determining how resources are allocated. The program leadership would determine the MRI schedule at each site by weighing up these various factors.

Guidelines for MRI

There have been guidelines on the usage of MRIs in some of the hospitals in Region A dated back before the region was created. There are two types of guidelines for MRIs. One type tries to determine MRI as the most appropriate test for a specific condition. The second type identifies appropriate patient wait times. Regarding the first type of MRI guidelines, there was some work done in Alberta around when an MRI should be made available to a patient. Ordering physicians were meant to check the guidelines before ordering a MRI to ensure it is the most appropriate modality for the specific condition. Given the wide range of conditions which may utilize a MRI and varying severities of

these conditions, all of which needed to be identified and categorized, the guidelines quickly became too complex to be easily usable. One participant said that what is needed is a system of electric ordering which could identify symptoms and disease conditions of the patient and match them to the most appropriate modality. Otherwise, a usage guideline system is not viable. The guidelines are simply too complex for frontline physicians to use and it would be too much work for a radiologist to review and reschedule tests. Another issue identified is that such explicit usage guidelines tend to increase usage, as guidelines of appropriateness tend to report a wider range of appropriate usages than are currently in use. Guidelines could thus increase demand, rather than limit MRI usage.

Rather than developing guidelines on MRI usage, Region A uses a system in which the radiologist reviews all requisition orders to screen out inappropriate usage. The radiologist also tries to determine which patients are most likely to benefit from accessing a MRI scan. If the information on the requisition is not adequate, it is sent back to the physician who submitted it. There are types of cases for which the radiologist will not fill MRI requisitions except under special circumstances, e.g., breast exams for low risk cancer screening. Participants felt that having radiologists review requisition orders was an effective and workable way to limit the inappropriate use of MRI scans. Previous reviews of the appropriateness of the usage of MRIs within Region A did not identify high levels of inappropriate usage.

Guidelines around wait times for MRI are developed by the province as part of its Wait Time Registry. Cases are divided by urgency. Every requisition is looked at by a radiologist to determine its category of priority. There are four categories of priority, each determined by clinical drivers. There are guidelines around the wait time for a scan for each of the four categories. The criteria for urgency are identified on the Region A website. Alberta's Wait Time Registry website (2006) identifies the targeted wait time for each urgency category and the actual wait time by site and region throughout the province. The wait time target for a priority one scan is one week. The wait time target for a priority two scan is one month. The wait time target for a priority three scan is three months. Priority four is an electively scheduled follow-up exam. The province and the region have agreed to meet these wait time targets, but the region is not currently meeting any of these wait time targets.

4.7.2 Resource Allocation Issues around MRI

Region A faces a number of resource allocation questions regarding MRI. There are executive level decisions regarding the number of MRI scans to perform and whether to invest in new equipment. The leadership team faces the question about how to allocate resources across the various MRI sites. The leadership team and site coordinators need to determine how cases are booked across conditions and patient type. There are issues around the use of guidelines as a means of limiting or managing demand.

Although there are numerous allocation decisions, the situation can be summarized as one in which the executive determine the supply of MRI scans for the region. The physicians

and radiologists determine the demand. This determination of demand includes factors which increase demand (requisitions by physicians) and those whihc limit demand (scanning of requisitions by radiologists). The physicians themselves determine which cases require an MRI or not. Because of the wide applicability of the technology, there will be for the foreseeable future greater demand than supply. This mismatch in supply and demand is reflected in wait times for MRI scans, which the province has set targets to meet in order to ensure that the supply – demand equation does not get too far out of line, due in part to the political importance of wait times for MRI. The other decisions around MRI within the Diagnostics program aim to maximize the efficiency of MRI resources.

Different types of decision making are used in allocating MRI resources at Region A. The supply is determined hierarchically by the executive, but they are very mindful and try to accommodate physicians' requests. The allocation of resources across sites and the booking of cases are also done top-down by the leadership team of Diagnostics. The demand is determined bilaterally by the physicians. The determining of requests for additional resources could be best described as collegial at first, but becoming more hierarchical as the process moves forward.

These resource allocation decisions, whom is responsible for making them and how the decisions are made are summarized in *Table 4.7*.

Table 4.7: MRI Resource Allocation Decisions at Region A

Resource Allocation Decisions	Decision Maker	Type of Decision Making
Determine wait time Guidelines	Executive / Alberta Health and Wellness	Closed-door, top-down
Determine the number of MRI scans to perform regionally Determine whether to invest in new equipment	Executive	Inclusive, but ultimately closed-door, top-down
Allocate resources across sites	Diagnostics Leadership Team	Closed-door, top-down
Determine MRI needs for the Region	Diagnostics Leadership Team, MRI Liaison Group	Bilateral
Book cases	Diagnostics Leadership Team, radiologists and site coordinators.	Bilateral
Determine whether to fill MRI requisitions	Radiologists	Clinical circumstances
Determine whether to order an MRI	Physicians	Clinical circumstances

4.7.3 MRI and Evidence

Numerous participants reported that they felt MRI is a known technology and there was little need to provide evidence of its effectiveness. One of the issues around MRI is that it is a developing technology which is constantly gaining in its capacities and its application. The range of application is determined by radiologists and frontline physicians who order MRI scans. In terms of what evidence this expansion of MRI application is based on, it is somewhat unclear. One participant said that practice at centers of excellence, i.e., renowned hospitals in their field, is one driving force.

Because of the nature of the technology, Region A is able to fairly accurately determine its MRI capacity, i.e., the total number of MRI scans it can do across all sites; and its remaining MRI capacity, i.e., total MRI capacity minus current usage. These figures are determined using internal operational data.

Determining the demand for MRI is more difficult because of the numerous factors which impact on MRI demand. Many of these factors, e.g., changes in population, impacts from over programs, are hard to accurately quantify. Internal data is used to some extent. So too is the best judgment of leadership of Diagnostics as to the likely impact of some of these figures.

Wait times and the amount of scans performed are reported to the Alberta Wait Time registry based on internal operational data.

4.7.4 MRI and Cost

The region sets a fixed amount which is gives Diagnostics for each MRI scan. This amount is set by internal costing data, adjusted for any known increases in operational costs for the coming year. There were no reports of using cost-effectiveness of different modalities in determining resource allocation decisions.

4.7.5 MRI and Accountability

Physicians are given the responsibility to make what they see as the best decision for their patient. Radiologists scan each requisition before it is filled to determine both its

appropriateness and its priority. Budgetary oversight for the program is provided through the leadership team of Diagnostics and through Region A's operating and capital budgeting processes.

In terms of accountability for meeting the demand for MRI, the regional is required by the province to publish updated data of the current wait times for MRI by sites and by region. The province also requires that the number of scan performed in each quarter is also reported by sites and by the region as a whole.

4.7.6 MRI and Ethics

The discussions about the ethics of MRI allocation focused always on accountability, e.g., the actions taken to make sure that usage is appropriate and that the process for allocating MRI resources and wait times for MRI are transparent to the public. There was no ethical audit of how MRI resources are allocation across the population.

4.7.7 Overview of MRI

Table 4.8 provides an overview of how the five component factors are handled by Region A's MRI program.

Table 4.8 Overview of MRI

Need	Determined by internal usage data and management's judgment of the impact of the numerous factors impacting on MRI demand.
Evidence	While it is recognized as a technology which is expanding both in capabilities and range of use, it is generally seen as an accepted, familiar technology. No use of research on effectiveness.
Cost	Analysis of internal costing and usage data.
Accountability	Alberta Wait Time Registry; public reporting of usage data by region and site; Activity Budgeting.
Ethics	Little ethical considerations.

4.8 Powered Upper Arm Prostheses in Alberta

Powered upper arm prostheses raise three key issues relating to resource allocation. The first is the prescription of a powered upper arm prosthesis. The second is around coverage and paying for the prosthesis. Third, there is the issue of how the providers of prosthetics allocate resources within their programs. These three issues are addressed in order.

4.8.1 Getting a Powered Upper Arm Prosthesis

To get a powered upper arm prosthesis in Alberta, a patient would first meet with a physician. After consulting with the patient, if the physician thought that a prosthesis is suitable for the patient, the physician would refer the patient to a prosthetist or amputee clinic. A team of a physician, prosthetist, physiotherapist and, maybe, the funders would determine what would be the best option for the patients. As one participant said, there is

a team of experts in the different fields, "there is back and forth to come up with a reasonable determination of need." Partially this decision requires a team approach because of the number of different factors involved in determining what is in the best interest of the particular patient, given that in prosthetics most cases need individualized solutions. There is no set method for determining who is best suited for a myoelectric prosthesis, but as one participant said, "a whole lot of factors come in but I have to tell you - it's most probably just experience, I guess [which determines which patients are recommended for myoelectrics]." As another participant said, the goal is to "identify what's going to be the absolute best piece of equipment for that person - you don't want to waste any money or someone else's money - and then help them to identify who might be possible sources of funding for that... for their device."

One of the biggest factors influencing resource allocation decisions around powered upper arm prostheses in Alberta is the very small number of patients who receive them. Two participants in the management of a large rehabilitation facility reported never having even seen one. One of these participants has over ten years experience working in rehabilitation in Alberta. Another participant reported her institution sees one person with every couple of years needing a myoelectric upper arm prosthesis. This would be in line with another participant's estimate of around two or three new cases of people receiving upper arm myoelectric prostheses annually for the entire province.

Beyond the fact that only a very small proportion of the general population faces upper extremity loss, there are a number of other reasons for the small patient population.

There are physiological issues related to having sufficient muscular activity to control movement of the prostheses. Patients also need the cognitive ability to be able to control their muscle activity. There are issues relating to patient choice. Most participants found that not everyone wants a myoelectric prosthesis. Conventional prostheses are often seen as more functional and easier to learn how to use and are therefore seen as preferable for many patients. There are issues relating to access to staff trained in providing upper arm prostheses. Due to the small numbers of patients, few prosthetists in the province work with powered upper arm prostheses. Occupational therapists and physiotherapists are not always available to train recipients of new myoelectric prostheses. Not every occupational therapist is trained to work with myoelectric prostheses. There were problems identified with the current level of technology. One physiatrist reported that functional outcomes with myoelectrics have not always been good. As another participant said "the dexterity of the hand is hard to replicate, even for myoelectrics." Patients also have issues around the weight of the prostheses. Many patients find learning tasks with the other undamaged arm or a prosthesis with the traditional grip much easier. The consensus amongst participants was that technology has developed so that it is a better alternative, but it is still not to the point where a great percentage of patients would benefit from powered upper arm prostheses.

Tied to the lack of functionality, there are issues around compliance. There is a general sense amongst the participants that many people do not use their myoelectric prostheses because they do not find them functional enough. Patients need to show the ability to be able to learn how to use a powered upper arm prosthesis, as well as a pattern of

compliance, before most physicians and prosthetists would recommend a powered prosthesis. Given all of these factors, as one participant said, for the prostheses community, myoelectric prosthesis "is probably not the number one choice." This opinion by the team of people providing and paying for the prosthesis also certainly influences patient demand. The factors limiting the use of power upper arm prostheses are summarized in *Table 4.9*.

Table 4.9: Factors Limiting the Use of Powered Upper Arm Prostheses

• Patient choice • Difficulty accessing trained staff • Functionality • Compliance • Difficulty of training • Other preferable options • Prosthetists seeing little benefit to the patient • Prosthetists not convinced of likely compliance • Lack of coverage / cost

4.8.2 Coverage for Powered Upper Arm Prostheses in Alberta

Coverage for powered upper arm prostheses is provided for through a patchwork of programs. Most people in the province are covered for powered upper arm prostheses through one of these programs, with the exclusion of some seniors. There are, however, variations in the level of coverage within each program. Alberta does not have universal coverage for the full cost of powered upper arm prostheses.

Alberta Aids of Daily Living Program (AADL) is the provincial program which provides coverage for basic medical equipment, including prostheses. The program is run through the provincial department of Seniors and Community Supports. The program is open to all Alberta residents who have a long-term disability or an illness lasting at least six months. Clients are assessed individually to determine their level of benefit. Clients are required to pay 25 per cent of the cost of benefits to a maximum of $500 per family per benefit year. Exemptions for these costs can be applied for. People over 65 years of age are also exempt from these costs. There are benefit limits set by the AADL program, depending on the type of device required. The AADL program does not cover training costs associated with new equipment.

With upper arm prostheses, AADL offers two levels of coverage. AADL provides full coverage for conventional prosthetic devices. The program does not provide full funding for powered upper arm prostheses. Coverage and benefit levels for myoelectrics are determined by the Manager of Prosthetics and Orthotics. Currently, there is a limit of $6000 towards the cost of a myoelectric prosthesis. This benefit level is currently being reviewed.

For people over sixty-five years old, prostheses are covered through Alberta Blue Cross for Seniors Program, which is a privately-run insurance program the premiums for which are paid by Alberta Health and Wellness. This program explicitly excludes all myoelectric prostheses from coverage (Alberta Health and Wellness website, 2007).

Alberta Blue Cross for Seniors Program does provide full coverage for all other types of prostheses.

Workers' Compensation Board – Alberta (WCBA) provides coverage for employees hurt at work. WCBA has no "preset limits to treat or lessen the effects of injuries and encourage return to work" (WCBA website, 2006). If a physician, prosthetist, and the WCBA case adjudicator agree that a myoelectric prosthesis is in the best interest of the client, WCBA will pay for the full cost of the prostheses and for training. WCBA will also compensate the person for lost wages which result from their injury.

Some patients have private insurance, e.g., employee health plans. Some patients are covered by other people's private insurance, e.g., as in the case of an auto accident. The level of benefit depends on the coverage associated with the policy. Residents in Alberta are also eligible for either the War Amps - CHAMP Program (for those under 18) and War Amps - Adult Amputee Program (for those over 18). First Nations and Inuit Canadians are fully covered for myoelectric prostheses under Health Canada's Non-Insured Health Benefits (NIHB) program.

In Alberta, people under 18 years old are usually fully covered by War Amps for myoelectric prostheses. In the case of a person under 18 years old, what would usually occur is that they would access the $6000 of coverage through the AADL and War Amps would cover the rest of the cost for a myoelectric. For people 18 to 65 years old, there is partial coverage through the AADL program and the War Amps - Adult Amputee

Program. There is full coverage if the person suffers the loss of an arm at work or is involved in an automobile accident in which they are covered by private insurance. Residents over 65 years of age seem to have little coverage for powered upper arm prostheses in Alberta. First Nations and Inuit peoples have full coverage. *Table 4.10* summarizes the coverage given through the various programs for powered upper arm prostheses in Alberta.

Table 4.10: Coverage for Powered Upper Arm Prostheses in Alberta

Program	**Who is Eligible?**	**Coverage**
AADL	Residents in Alberta (under 65, with some restrictions)	Up to $6000 coverage (with up to a $500 co-pay)
Alberta Blue Cross for Seniors Program	Residents in Alberta (over 65)	No Coverage
WCBA	Employees injured at work	Full Coverage
Private insurance	Depends on Policy	Depends on Policy
War Amps - CHAMP Program	People up to 18 years of age.	Full Coverage
War Amps - Adult Amputee Program	People over 18 of age.	15 % towards the cost of prosthesis up to $1500.00 once every three years
Non-Insured Health Benefits (NIHB)	First Nations and Inuit Dissent	Full Coverage

4.8.3 Coverage within AADL

Managers in the AADL program continually examine the benefit limits set for devices within their specific program areas. The need for changes in coverage is identified by patients, managers, and providers. When the need for a proposed benefit change is identified, the division manager would discuss the likely impact of any changes with the

AADL program's director. This discussion would include considerations of the available options, the expected number of cases affected, and the expected net cost of the changes to the program. If the program director supports the proposed changes, they are submitted to the deputy minister of Seniors and Community Supports for approval. These requests to change coverage would often be made as part of the wider provincial government budgeting process. There have also been cases where coverage has changed, but where additional costs to cover the changes had to be recouped from other program areas. The benefit level is set in provincial legislation so there is no flexibility on the part of managers to adjust the benefit to individual cases once the benefit limit has been set.

AADL's coverage of myoelectric prostheses has been an evolving process. In early 1991, the AADL program began letting the patient decide whether they wanted either a conventional prosthesis or a myoelectric, but the program only paid up to the cost of the conventional prosthesis. This situation often left a significant funding gap to be covered by the patient who would benefit from a myoelectric prosthesis. In 2003, AADL raised the benefit limit for myoelectrics to $6000. While a significant improvement, this amount still did not cover the full cost of myoelectric prostheses. In 2005, AADL again reviewed its myoelectric benefits to see if their program was giving sufficient assistance. This review was partially done by consulting with the prosthetists. The main issue examined was the cost of powered upper arm prostheses to the client. There was some concern identified by the prosthetists about the substantial gap in funding which still exists. AADL is in the process of readjusting its benefit limit to address this funding gap for powered upper arm prostheses.

The AADL program has clear criteria regarding the funding of powered upper arm prostheses. Seniors are not eligible for funding. This restriction was put in place because of the unlikelihood that seniors would complete the training needed to learn how to use a myoelectric prosthesis. Adults must show a demonstrated use of a conventional prosthesis continuously for at least a year but before being considered for funding. There are some exceptions which may be considered. A patient who is mentally functional and clearly desires a myoelectric prosthesis right away may be funded without showing a demonstrated use of a conventional prosthesis. All exceptions would be determined on a case by case basis by the AADL program manager. Children also need to demonstrated use of a conventional prosthesis continuously for at least a year before being considered for a myoelectric prosthesis. Prostheses are not funded for anyone under the age of two. Patients who decided they do not like their myoelectric prosthesis must wait two years before receiving funding for a conventional prosthesis. Finally, a prosthetists needs to agree that the person would benefit from having a myoelectric prosthesis.

While the AADL fund the prosthesis, they work with outside partners to provide all their prostheses services. There are 25 private prosthetic clinics which AADL contracts with in Alberta. AADL also contract some work out to the regional authorities, including Region A. With all of these providers, AADL sets the prices they will pay for equipment and installation time. Materials are paid-for at cost, plus a small mark-up to allow for shipping and handling costs. Prosthetist labour costs are paid on an hourly rate, so that there is no advantage to the prosthetist to use more expensive materials than are needed.

Regardless of the fixed pricing, the working relationship between the AADL and its partners appears to be quite good.

4.8.4 The Allocation of Resources in the Prosthetics Division

Unlike endovascular coiling and MRI, powered upper arm prostheses are not primarily installed or serviced through the regional health authorities in Alberta. Some of the health regions do have programs which can fit powered upper arm prostheses. For example, Region A has a facility which does offer powered upper arm prostheses services. But most of the prostheses work in the province is performed by independent prosthetists in private clinics.

In Region A, prosthetics is a division of the rehabilitation program. Given the small number of myoelectrics Region A install, and the fact that their cost is paid for by third parties, participants reported that they face no real issues around the allocation of resources for myoelectric prostheses. In fact, the prostheses program aims to be not just cost recovery, but rather to be profit generating. Resource allocation issues that do occur for the prostheses division, including for myoelectrics, are often about the distribution of staff time across different rehabilitation programs.

Prosthetics make its request for resources to the COO of Rehabilitation as part of Region A's regular budgeting process, similar to the process identified above for Diagnostics. Region A's rehabilitation program uses a checklist to evaluate requests from the specific division, including prostheses. Requests for additional resources would be also supported

by the business case for additional resources. This business case would identify why the request is getting put forward, compare national or provincial benchmarks, the results that would come from additional resources, and what clinical best practices there are. Changes in service volumes would also be looked at.

Most of the costs in the area of rehabilitation are human resource costs, so that funding is not as flexible as they may be in other areas. Rehabilitation has also not traditionally gotten substantial new funding beyond what is required to cover inflationary pressures. Sometimes new money comes from provincial wide initiatives, e.g., Alberta Health and Wellness' focus on hips and knees. But as one participant said, "it's not like the dollars that come [are] sort of lying there, wondering how do I use it. It's more where can you trim, where can you increase efficiency and what not, so in terms of allocating resources to the programs, there isn't as much flexibility as one might think." As another participant said "we could be more efficient and that might create some resources that we could allocate ...most of it is resource re-allocation." In terms of resource allocation for the program, the focus has primarily been on improving the efficient use of resources in order to provide better patient care. This improved efficiency has often been through the redesign of programs to allow for savings.

Region A's rehabilitation facility has a practical ethics group. This group can be consulted about hard decisions which need to be made, including resource allocation decisions, but the ethics group would be mostly involved in cases involving individual patients.

4.8.5 Resource Allocation Issues around Powered Upper Arm Prosthesis

There are three main questions concerning resource allocation and powered upper arm prostheses in Alberta. The first is the question of who should receive a powered upper arm prosthesis. This decision is a clinical circumstance decision based on the consensus of the team of providers. This team would include a physician, prosthetist, and other professional staff. This decision would be an example of collegial decision making.

The second question relates to the coverage of powered upper arm prostheses. Alberta does not have universal coverage for the full cost of powered upper arm prostheses. Coverage for powered upper arm prostheses is provided for through a number of programs. There is little communication between these programs to ensure that all people are fully funded for their prostheses.

Within the AADL program, the benefit limit for myoelectrics is currently being readjusted, but is still expected to leave a substantial gap between the cost of myoelectric prostheses and the maximum benefit under the program. Coverage decisions are made by the deputy Minister for Seniors and Community Supports, through discussion with the AADL program director and Manager of Prosthetics and Orthotics. The coverage decision is a program level, top-down, closed-door decision. How coverage decisions are made with the other funding programs was not examined.

The third question examined was how resources were allocated around the prosthetics program of Region A. They reported that there was little concern with how resources are

allocated around powered upper arm prostheses, due to the fact that the cost of providing care is paid for by third-party insurers and that there are so few installed.

4.8.6 Powered Upper Arm Prosthesis and Evidence

Powered upper arm prostheses are seen as a proven technology and there is little concern expressed about their effectiveness. In terms of who receives a myoelectric prostheses, there are a number of factors looked at. These factors primarily focus on determining the ability of the patient to wear a myoelectric arm, the likelihood that he or she will benefit from a myoelectric prosthesis, and the likelihood of his or her continued use of the prosthesis. The information about all of these factors comes from discussions and examinations with the patient.

In terms of coverage of myoelectric prostheses at AADL, the information is based on discussion with prosthetists and costing information from suppliers. Internal data is used to determine the likely patient population. The internal costing and usage data is used to determine likely financial impact of any changes in the benefit limit will have for the program.

4.8.7 Powered Upper Arm Prosthesis and Cost

Because of the small number of people requiring myoelectric prostheses, there is no consideration of cost-effectiveness. For budgeting purposed, the net cost of equipment is calculated by examining internal data, checking with suppliers and through discussion

with prosthetists. For the AADL program, labour costs are fixed through negotiations with the prosthetists on an hourly rate.

4.8.8 Powered Upper Arm Prosthesis and Accountability

The decision to provide a myoelectric prosthesis is based on a consensus decision made by a group of providers, all who abide by their professional standards.

The AADL program must abide by all government accountability legislation. AADL (2006) have manuals which clear specifies the program policies as well as the policies associated with the specific type of device provided, including prostheses. AADL does have a Program Analysis & Accountability Unit which reviews complaints about any aspects of the program, including coverage issues.

4.8.9 Powered Upper Arm Prosthesis and Ethics

There are some concerns with age-based rationing for myoelectric prostheses in Alberta. Currently people over 65 years of age are excluded from myoelectric coverage under the AADL and the Alberta Blue Cross for Seniors Programs. The reason for this restriction is that it is felt that it is unlikely that someone over 65 years of age would go through the training to learn how to use a myoelectric limb. The practical effect of this restriction is greatly minimized by the fact that the vast majority of people face upper extremity loss before the age of 65.

The rehabilitation facility in Region A does have a practical ethics group which can be brought it to consult on difficult resource allocation discisions, although this is done primarily on a case by case basis. It was not known whether the group dealt with a case of myoelectric prosthesis, but a participant doubted it given the very small number of myelectric patients seen by Region A.

4.8.10 Overview of Powered Upper Arm Prosthesis

Table 4.11 provides an overview of how the component factors are handled by Region A for power upper arm prosthesis.

Table 4.11: Overview of Powered Upper Arm Prosthesis

Usage	2 to 3 annually for province
Resource Allocation Decisions 1) Prescription 2) Coverage (AADL) 3) Region A	 1) Clinical circumstances, collegial. 2) Program specific, top-down, closed-door 3) None
Need	Determined by usage data.
Evidence	Clinical circumstances of patients. Seen as an effective treatment.
Cost	Internal data and vendor supplied data.
Accountability	Professional standards and general government accountability requirements. AADL has a unit which examines complaints about the program.
Ethics	Age-based restrictions on care.

4.9 Best Practices Identified in Alberta

There were a number of best practices which participants identified in Alberta. A number of participants identified the important of the experiences and skills which decision makers possess. One participant identified that it was good for decision makers to have frontline experience, so that they are able to understand the clinical experience better. Related to this, another participant suggested that decision makers work more closely with frontline staff, to better understand their issues. Teamwork was seen as an important element by many participants. As one participant said, "I would describe budgeting or budget allocations as an art and a science. …it takes a lot of people working together to get the best results. And so doing this as a team and having a highly functional team are key ingredients to it." Many participants said that they felt that there was good communication between the programs and the executive within Region A regarding needs and funding priorities at the program level. A management structure and an organizational culture which allow for good communication between the staff and the executive team are seen as key strengths for improving resource allocation. Activity budgeting was something that participants thought was both good as a method for resource allocation and something participants thought Region A was good at doing. Activity budgets also allow for a clear comparison across sites within the organization, to identify inconsistency in the level of care. Tied to this activity budgeting approach, there was a sense that programs where getting better understanding their activity drivers and therefore better predicting their future demand. In terms of bring in new information into the organization, one participant emphasized the role of going to conferences for letting the organization see new ways of may be organizing care.

More standardization and familiarity with processes were identified as a positive step for improving resource allocation. As one participant said the process of allocating resources are good, especially

> "where everybody knows the rules. Everybody knows the information they have to collect and everybody knows they have to buy into it. I mean, to me, those are the aids because, I mean, it's a difficult process to go through. I think everybody would struggle with it. You never know if you've gotten the answer right, but you need to come out of it with an organization that is committed to making it work and to me it's that process..."

Related to process stability is stability of personale within the resource allocation process. As one participant said, Region A has "been fortunate to have very stable leadership at the executive level in this region and very limited turnover. That is huge."

Regionalization was also identified as beneficial for resource allocation. One of the purported benefits of regionalization was to improve resource allocation across the regions. It has certainly changed the discussion at the decision making table. As one participant described the situation, "as a region we cover everything from public health to community care to long term care to the acute care side to the diagnostics. ...it goes on forever." Although regionalization does add a level of complexity, it also gives the region more control in how they best allocation resources across these program areas. If a region, like Region A, decides that investing in long-term care beds is the best way to address problems in their emergency rooms, they have the ability to do that. As the participant further said, "it's complex. I mean, there's no formula to any of this but those are some of the factors that we take into consideration, and that's part of the leverage that

we can attain from being a regional system. ...Under the old structure where we were individual hospitals, we didn't have the opportunity to invest in home care or invest in continuing care or invest in promotion to avoid and reduce the pressure on the acute side. We do now as a region."

The ability to transfer resources across program areas raises the issue of greater resources for prevention and health promotion. Although regional structures do allow for the opportunity to invest greater resources into prevention, the choice between investments in prevention and acute care remains difficult. As one participant said, regardless of the logic of reducing demand, "it's still very difficult to invest on the promotion side because it's really a double investment. You still have to do the treatment and the promotion investment doesn't benefit the side until maybe 20 years out." This double investment issue is certainly a problem for those who see better resource allocation tied to increased resources for prevention and health promotion.

Two participants mentioned Alberta Provincial Stroke Strategy's four pillars approach could to be usefully applied to resource allocation. This approach is based on explicitly looking at funding for a treatment area in four distinct phrases: 1) prevention / health promotion, 2) acute care, 3) rehabilitation and community care, and 4) service evaluation. As the participant describes the approach, "the Heart and Stroke Foundation have committed 20 million new dollars to this project provincially, but they have decided to do is they've allocated that 20 million dollars amongst the four pillars." The goal, as the

participant describes is "to force the allocation of resources to address the different aspects of the disease group."

The best practices identified by participants in Alberta are listed in *Table 4.12*.

Table 4.12: Best Practices Identified in Alberta

• Decision makers having frontline / clinical experience • Decision makers working more closely with frontline staff • Good communication structures / open organizational culture • Working in teams • Activity budgeting • Identifying drivers of demand • Going to conferences to identify future trends • Familiar processes • Four pillar approach

4.9.1 Decision Aids Identified in Alberta

One of the initial goals of this project was to identify and develop relevant decision aids. Some decision aids for resource allocation were used in Alberta. For example, the rehabilitation facility reviewed in Region A uses a check list to help prioritize their budget requests. There is also some movement within Region A to use more standard processes around making resource allocation requests. Most participants, however, expressed doubts about the applicability of any type of decision aid due to the variation in resource allocation requests and the various factors involved in different decisions.

4.9.2 Challenges Identified in Alberta

A number of challenges were identified to improving resource allocation. Some of these challenges relate to the problem of resource allocation generally. Some of the challenges relate more specifically to Alberta and Region A.

One problem identified related to legitimate needs. As one participant noted, all of the programs areas put forward requests which are legitimate, centered on delivering the best care possible to the patients in their particular program area. The question for the executive is how to determine whose need is the most crucial. In making resource allocation decisions, the executive are clearly leaving certain people without care they would benefit from. This problem is at the crux of the difficulties around resource allocation decisions.

Knowledge translation is another area of concern. The problem arises partly because of the hierarchical decision making structure in health regions. As the allocation requests move towards the executive, they become further and further removed from people with expert knowledge in the area of concern. As one member of the executive team said, "I then have to not only learn it [an item requested within their program portfolio] and understand it well enough to make a reasoned presentation to my executive colleagues, but they have to understand it enough to be able to make priority investment decisions." There is a challenge then about how to describe program requests in sufficient detail to allow for their meaningful consideration, without overwhelming decision makers.

Another communication problem identified relates to how frontline staff are kept informed of the region's budgetary situation. There are difficulties here because of the length of time budgeting takes, between six to eight months, and the size of the health regions. The size of the region makes it difficult to communicate to the staff the specific factors involved in budget decisions or what the resource expectations should be for the organization going forward. One participant suggested, there needs to be a way to portray "a simpler, easier-to-understand, display of the big picture" [throughout the organization].

Managing expectations can be difficult within Alberta's financial environment. Given the media reports about provincial budget surpluses and prosperity checks, the staff and the public do not feel that there is, or should be, a shortage of health care resources. One participant suggested a number of ways to mange these expectations within the organization. One is to involve program managers and clinical staff more in managing the budgets for their programs. Working with budgets will allow managers and physician leaders to understand what kind of resources they have to work with to deliver a certain level of service. Greater involvement also allows the managers and physicians to be accountable for a certain amount of resources, thereby creating greater accountability across the organization. The executive also need to communicate the overall financial situation of the organization to the program managers and physicians. This need to communicate the region's financial situation to the frontline staffs ties back to the challenge of how best to do this.

A number of participants discussed the idea of better gauging institutional impact, even if they did not use this exact term. In particular, there was the feeling that there are not sufficient capabilities in determining the impacts of new technologies. Often it is unclear what impacts a technology may have on the organization until it is adopted. For example, as one participant said, "with something as complex as an MRI machine, it is very hard for lay people, including decision makers to understand the impact of new technology." Issues here include how is the new technology going to impact on professional dynamics within the hospital setting? What other services will be affected by the introduction of a new technology? How will investments in a technology save money later down the road? It is somewhat unclear how an organization could better evaluate these impacts.

The issue of annual budgets was raised by a couple of participants. There were two aspects to the issue. The first was the budgetary instability and the difficulty this caused for long term planning. The second was the amount of time that goes into budgeting. As one participant said, "Just even 3 years [of stable funding]! Oh my goodness, the level of complexity that would be taken out of the system is enormous because every year you go through this [budgeting process] and the hours and energy that goes into this budget allocation and it's unbelievable. Honestly, it's unbelievable."

Some participants felt that there was still too much political and media influence on how resources are allocated. As one participant said "you would hope that the money goes to where the evidence is...while, you know, reality is money goes to what makes the headline." There is also a feeling that while the priorities are often based on evidence at

the program level, as the budgeting process continues, and some factors become considered, the influence of evidence decreases. As the same participant said

> "we believe that the best way to make our case at Executive is to have some evidence behind it. Then all these other extrinsic things come to play, and it becomes a political decision, not an evidence-based decision. We work with our Chief Operating Officer very closely and we come up to some agreement and we try and base our agreements on best evidence, after that it's out of hands and evidence generally falls by the wayside."

There were also problems identified relating to the mismatch of the budget cycles and funding flows. As one participant said, "we never get the money actually into our budget until usually well into the year. We need that money to hire the staff and we need to hire the staff before you can do the work. So we're always behind." The difficulties associated with mismatch in cycles is made worse by Region A use of activity budgeting. As the participant continued, "because we're activity funded, they say you're going to do so many exams. Well, you need the staff in place to do those exams. Well, if the money doesn't flow, you can't hire the staff so you can't do the numbers. So then when you come up to the budgeting process again, they get mad because you didn't reach your target, and you can't reach your target because you can't hire the staff until you get the money. So it's a Catch-22."

There were a number of other areas of concern identified. Region A does do some benchmarking. This is usually done within the program areas themselves. Still it is an area one participant suggested needed to be improved on. Better evaluation of programs was also identified. Regarding technological assessments, one participant said "the

technology changes so quickly that I don't worry about the assessment as much as the impact." One of the problems with doing assessments is that the technology is never stable. By the completion of an assessment, a similar, but slightly different technique may come about which will need to be assessed somewhat differently. This greatly diminishes the value of health technology assessments in making resource allocation decisions. While there is the need to involve a team of people in resource allocation decisions, given the size of an organization, like Region A, there are also problems associated with bringing too many people into the decision making process. Conferences were identified as a good way for a health region to keep informed of new trends in different areas of care, but they are also an important source of demand. Sometimes this demand is not thoroughly evaluated. As one participant said, "of course our wonderful doctors and ET nurses were at a big conference, saw the presentation, said we have to have this." Finally, another difficulty for improving resource allocation relates to the feeling that resources are often already accounted for, so that there is not many options in how resources are allocated. "Everything is tied to everything," so that there is, as one participant said, "not a whole lot of wiggle room" in how resources are spend. All of the challenges identified in Alberta are listed in *Table 4.13*.

Table 4.13: Challenges Identified in Alberta

• Legitimate needs • Knowledge translation • Keeping staff informed of budget situation • Managing expectations • Gauging institutional impact • Mismatch of budget and funding cycles • Annual budgeting • Too much political influence • Better benchmarking and evaluation • The speed of technological advancement • Involving too many people • Conferences • Resource already accounted for

Chapter 5: Newfoundland

This chapter examines the three cases in Newfoundland. It follows the structure of the previous chapter on Alberta. It begins by first reviewing the decision structure of Region B before moving to examine decision making in the three areas of care. As in the previous chapter, there are subsections focusing on the embedded elements of resource allocation decisions, need, use of evidence, cost, ethical considerations and accountability for Region B and each of the three areas of care. The final section discusses the recommendations, decision tools, and the challenges identified during the interviews in Newfoundland.

5.1 Regional Structure

Newfoundland has a regional health structure governing the delivery of both health care and social services. In 2005, the province consolidated its health and social services boards from fourteen boards, which were defined both regionally and in terms of specific service areas, to four integrated boards, which offer a full range of acute care, long-term care, mental health, rehabilitation, health promotion, preventative care and social services.

The health regions' operational costs are primarily funded through global budgets they receive from the provincial Department of Health and Community Services (DHCS). In some cases, the DHCS may earmark funds for particular initiatives within the region. In fact, there has been an increased use of targeted funding in recent years. The Health Accord money was a particular example of targeted funding, where the DHCS asked the

health region's to provide a list of spending priorities in the five specific areas as a part of the usual budgeting process. The health regions also have access to some other, much smaller, sources of revenue. These include payments for services provided for Newfoundland and Labrador Workplace Health and Safety and from their charitable foundations.

The region's capital budgets are determined somewhat differently. There are three types of capital requests which come from the health regions: 1) for medical equipment, 2) for repairs, maintenance to their facilities, and 3) for new facilities. Based on the financial situation of the province, Treasury Board will normally allocate a nominal amount for each of the three categories. New large capital projects would be approved by the cabinet as part of the provincial budgeting process.

The region's annual global budget is set by the DHCS and the provincial cabinet through the provincial budgeting progress. There is a good deal of back and forth between the health region, DHCS and Treasury Board throughout the budgetary process. One way to think of the connection is that the region, the DHCS and Treasury Board are all setting their independent budgets, but that these budgets are greatly influenced by the budgets of the other institutional levels. The provincial budget is greatly affected by changes in the amount of funds the provincial government directs towards health. The health regions have a great impact on the government's overall health care spending. It is, however, the provincial budget which determines the amount of funding the regions have to spend. One of the reasons for so much interaction across the three institutional levels is that the

success of the budgetary process depends on the three budgets, i.e., the province's, DHCS's, and the health region's, being aligned. DHCS and Treasury Board officials said that they have sufficient understanding of the utilization needs and uses of funds by the four regions to negate the usefulness of adopting any type of formula-based funding. In fact, the DHCS said that often they have detailed data on the region's budgets on a line-by-line basis to guide any budgetary decisions. The distribution of services and population across the province also make formula-based funding problematic.

DHCS begin by examining their previous year's budget on departmental program basis. At the departmental basis, funding to the health regions is seen as one program area. DHCS would receive some guidance from Treasury Board officials about the expected levels of inflation and a rough estimate of any changes in the size of the department's budget for the coming year. DHCS would then adjust their budget request for any likely changes in the costs associated with the program over the year, e.g., population changes, inflation, addition of new services, salary increases based on collective agreements.

The department would then ask the health regions to submit their budgetary requests. DHCS would also give the region some guidance about the likely size of any changes to their budgets for the coming year. The region would adjust their priorities to better match the amount of funds likely to be available. It is likely that there would be discussions between the department and the health region about the level of service delivery and the trade-offs that would have to be made at different levels of funding. If the region is going to get less money than the previous years, the region would then determine the areas and

programs it proposes to cut. The department would then look at this list and determine which programs it would like to continue to support, sometimes by providing funds to ensure a particular service remains available. The region would submit its request for new resources to the DHCS. DHCS would then finalize its budgetary request and submit it to Treasury Board, who analyze it and forward it to the provincial cabinet.

As a part of its budget request, DHCS would include the requests from the boards. The department would specify to Treasury Board which parts of the regions' requests it recommends funding. The DHCS would also outline what the implications in terms of service delivery at different levels of funding. As one departmental official said, the submission to Treasury Board, and ultimately cabinet, would be framed around the trade-offs that have to be made at different levels of funding for the different programs. The idea is to provide the cabinet with clear choices in terms of the level of funding to the different programs and what the implications of those decisions will be. The cabinet would not generally become involved in decisions concerning specific boards. Any major expenditure, e.g., the creation of a new program or the purchase of a MRI, would usually require cabinet approval. The cabinet may also become involved in issues that it considers politically sensitive. For example, the issue of where to locate MRI resources across the province would likely be made by the provincial cabinet.

The regions are expected to review requests to provide new services, especially new services which require substantial funding, with the DHCS. The health regions would review the evidence for new services it is requesting funding for. If the region's

executive concludes there is sufficient evidence to support, the region then makes their case for starting the service to the provincial government. These requests are reviewed by the medical and program staff within the DHCS. Their task would be to first review the actual need for a service. If there is agreement on the need for the service, the department would then determine the level of funding to be provided for the new service. The departmental investigation is very much patient focused. As one departmental official said, "we get all kinds of requests for funding and what we try to bring it back to it is that client or patient being served by service." There is also a consideration of the costs and of whether the public are being best served "by the money being spend in this way." There is a challenge that sometimes the group who make the most noise get their request filled. The use of evidence is seen as a way to better assess the most rational way forward. Regardless of the strength of requests, they also have to meet with cabinet priorities. Strong evidence-based analysis sometimes is overruled at the cabinet level by economic, political or regional issues.

In March, the provincial cabinet sets the provincial budget, including DHCS's departmental budget, for the coming fiscal year. Once it knows its budgetary allocation, DHCS would then do some further analysis and allocate resources for each program, including each health region. The regions are then informed of the total size of their global budget for the coming year. The department would also communicate to the region any operational goals the cabinet or the department expect the region to meet.

It is the health regions, as the deliverers of care, who are responsible for meeting their operational outcomes. Yet DHCS sees its roles as helping to ensure that the regions have processes in place which show that public funds are being spent appropriately. While the DHCS has always had fairly tight financial controls over the health regions, the relationship between the two institutional levels has matured over the years. One provincial official reported, previously "we said to the boards - do not over exceed your budget, but don't deny services... [we] really gave them an impossible task because you can't do one without the other, necessarily." The situation is now one in which health regions are suppose to balance their budgets, but that they can come back to DHCS and make the case for additional resources if needed. These requests can be made at any time, but are usually made as part of the regular budgeting process. There is a greater level of understanding of the issues being faced by the health regions and the greater sense of a shared responsibility for addressing shortfalls in resources. The reduction in the number of health boards may also improve the working relationship between the two institutional levels.

Participants in the regions did express some level of support for the way the DHCS determines the region's budget. These participants also said that keeping spending within their determined budget, delivering what they claim to deliver and being very open and honest with the provincial government has helped make this relationship work between the two organizations. The Department also seems to respect the requests that come from the regions. One departmental official said the department still does not have a good understanding of the spending within the specific regional programs. One possible

reform is for DHCS to start assessing spending at the program level within the regions. This would give the department a better sense of any problems earlier on. The information about the regional structure is reviewed in *Table 5.1.*

Table 5.1: Regional Structure (Newfoundland)

Number of health regions in the province	4
Current health regions established	2005
Scope of regions	Acute care, long-term care, home care, health promotion, prevention activities, cancer care, rehabilitation and social services
Method of funding	Primarily historical-based, global budgeting. Requests for additional funds for new or expanded programs are made directly to the provincial government. DHCS or cabinet would decide on major allocation decisions.

5.2 Region B

Region B is the regional health authority responsible for providing a full range of services, including acute care, long-term care, home care, health promotion, prevention activities, rehabilitation and social services. In 2005-6, the four regions in Newfoundland shared total revenues of over $1.4 billion. Region B received approximately $2000 for every person in its region. For 2006-2007, the four health regions received an increase in their operating budget of approximately 7.5%.

5.2.1 Governance Structure

Region B is governed by a board of trustees. Trustees are appointed by the Minister of DHCS and are usually fairly prominent members of the local community. The board reviews the region's activities, provides strategic direction to the region, releases an annual report and chooses the CEO. Board committees examine specific activities of the region, e.g., finance.

The CEO oversees the region's day-to-day operations and is instrumental in setting the region's budget and operational goals. In Region B, the CEO is supported by a number of vice-presidents who have responsibility for both corporate and clinical program areas. Reporting to their respective vice-presidents are the leadership teams of the various corporate departments, e.g., human resources, corporate communications, and the different clinical programs. Clinical programs have a leadership team consisting of a clinical chief and a program director. The clinical chief is responsible for quality of care and other physician issues. The program director is responsible for the overall administration of the program, including some of the human resource issues and budgeting. While all programs are run on a regional basis, some clinical program areas have division managers who manage issues relate to their particular site and report to the regional program's leadership team.

Another important part of the management structure at Region B is its Medical Advisory Committee. This committee is made up of senior physicians, including all the clinical chiefs, the vice-presidents for clinical areas, and the CEO. The Medical Advisory

Committee is the forum where issues affecting quality of care are discussed. Resource allocation issues could also be discussed. As one member of the Medical Advisory Committee said: "It's a good forum for discussion before recommendations come forward to the executive and then on to the board in terms of resource allocation, or new technology, new programs, [or] new services." This Committee reports to the board of trustees during each board meeting to outline any of its concerns regarding the delivery of care.

Figure 5.1 provides an overview of Region B's governance structure.

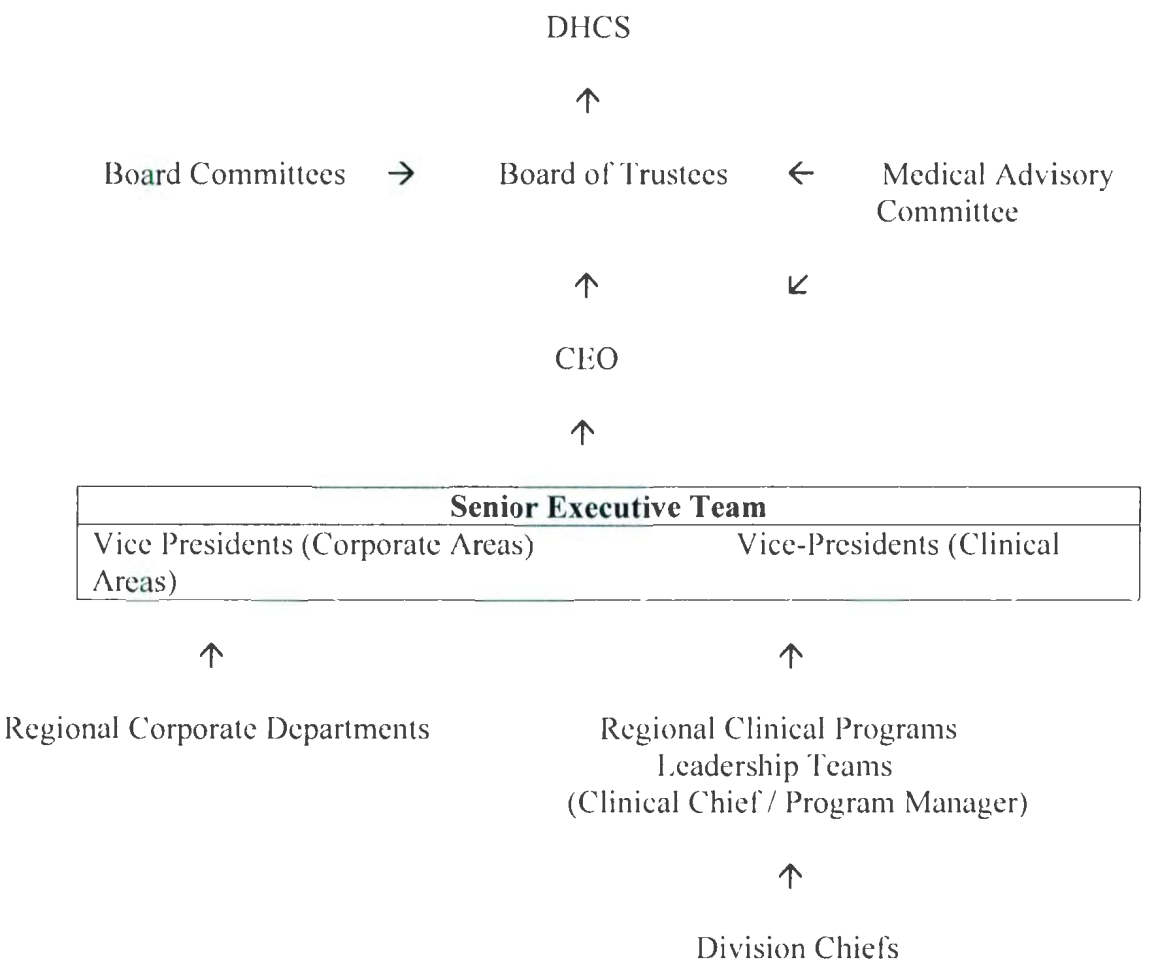


Figure 5.1: Governance Structure at Region B

Table 5.2 summarizes some of the information presented in the previous two sections about Region B's financial status and management structure.

Table 5.2: Region B Financial Data and Management Structure

Total revenue (four regions)	$1.4 billion
Revenue per capita	$2000
Increase in operate costs (2006-2007)	7.5%
Management structure	Regional programs

5.3 Resource Allocation at Region B

Budgeting is currently based on adjusting the previous year's budget for likely changes in services for the coming year. In 2001, the part of Region B which was previously responsible for acute care performed a review of all its programs and readjusted the level of funding for each program. Funding was adjusted using a clearly stated method, based on national benchmarks for providing care in each program area. This review was an attempt to move away from historical patterns of funding which had existed before the acute care region was established. This review also looked at which services programs were providing to identify services which may be outside of the region's mandate. One participant suggested that a similar review may be conducted once Region B is better integrated.

In Region B, the capital and operational budgeting processes are independent exercises. There has been a move in the last few years to more closely tie the two processes so that the two budgets are produced at the same time. The attempt to more closely integrate the two budgeting processes is hampered by the provincial government keeping its capital

and operational budgets separate. For proposals with large operating and capital costs, e.g., the purchase of an MRI, they may be submitted to the DHCS as one proposal.

Region B reports a trend towards increased targeted budgeting by the provincial government. Another trend is that funding increases are more often tied to achieving specific operational goals. The increased use of targeted funding is meant to improve the transparency and efficiency of how funds are spent.

Sources of Requests for Additional Resources

Participants identified numerous sources of requests for additional resources. Physicians often request additional resources, either in terms of requesting to perform new services or requesting the purchase of new equipment. Operational reviews have been conducted both internally and by external consulting firms. These reviews have resulted in recommendations regarding spending priorities. Accreditation reviews have influenced resource allocations. Compatible data on utilization, usually on a national basis, is a driving force. Internal data on utilization patterns and wait times was also sighted as being important. Patient knowledge of new treatments, gained either through TV or the internet, is another important source of demand for new services. Participants pointed out that public pressure for new services can often determine resource allocation, even if there is no or little evidence of benefit. Newfoundland's geography was mentioned by a number of participants as creating demands for resources, as rural areas demand services be allocated in their area. People feel that they should get the service close to home, even if it is not very economical. The location of services is also an important issue in

regard to maintaining economic infrastructure and employment in rural areas of the province.

The Budgeting Process

The budgeting process begins with the region's finance department sending out a budget template to the leadership team of every program, usually in the early fall. The use of a standard template helps allow for consistent data collection across the program areas. The template helps the programs identify their cost centers and unavoidable costs. The budgeting template also asks about gaps in service, services which should be added and what operational changes are likely for the program in the near future. The programs would have internal discussions to identify what their service pressure are, what gaps there are in service and what their spending priorities should be for the coming year. The focus of these discussions would be on what is required to meet the needs of the population and to ensure quality services. The program directors and clinical chief also try to forecast what are going to be the main cost pressures for the coming year within their program area. A budget analyst from the finance department will then met with the program manager and assists him or her in completing the budget template. The template for each program is submitted to the finance department. Based on the budget templates submitted by the programs, the department of finance develops a three-year budget plan, with the primary focus being on the coming fiscal year. A three-year plan allows the senior decision makers to begin financially planning for expenditures which will need to be made in the near future. A summary of the templates submitted by the programs and the three-year budget plan are presented to the executive for discussion.

In parallel to the development of a budget plan, the program leadership teams would discusses their budgetary requests with the vice-president responsible for their program area. These program priorities would also be discussed in Medical Affairs Committee throughout the year. Although the budgeting process is in the fall, through these discussions, the senior physicians and the executive have a good idea of the coming budgetary requests before the budgeting process has begun. The region has been trying to let a wider range of staff members provide information in the budgeting / priority setting process. This is usually through contact with the vice-president responsible for their clinical area. Region B also has leadership days and strategic planning sessions with senior management which physicians and other management members can attend to express their views on what the region's spending priorities should be.

Participants described the budgeting process as having a good deal of communication across the different levels of decision makers, e.g., Treasury Board officials, DHCS officials, regional executives, and officials from the region's department of finance. One reason for this level of communication is the need for the region's budget to be in line with DHCS's budget. As one participant said, "if you built your proposal so rich that government doesn't even look at it, you've kind of defeated yourself." Both officials from both DHCS and Region B felt that they had a good working relationship and that they have a good sense of what each other priorities are. The budget guidance given by DHCS would influence both the development of the budget plan and the discussion the executive have about it.

For new program initiatives, the region would first try to fund the initiative from resources they already have by shifting resources from other programs. When there are not sufficient resources available internally, they would then put forward a request for additional resources to the DHCS. No large program would likely be established by the region without the approval of the DHCS. In some years, Region B has had decreases in their global budgets which have made the introduction of new technology, as one participant said, "exceptionally difficult unless the new technology can save you money in other areas."

In late fall, the executive would discuss the budget plan developed by the finance department, including all budget submissions from the different program areas. The aim is reach a consensus on the region's operation and capital priorities amongst the executive members. If consensus cannot be achieved, the CEO would make the final determination. The executive would then submit their budget requests to the DHCS.

In the end of March, once the provincial cabinet and DHCS have determined the region's annual budget, the region's executive would then finalize its annual budget. The executive would then inform the specific clinical programs of any increases in their budgets for the coming year and which of their specific budgetary requests have been approved.

Figure 5.2 provides an overview of Region B's priority setting and resource allocation cycle.

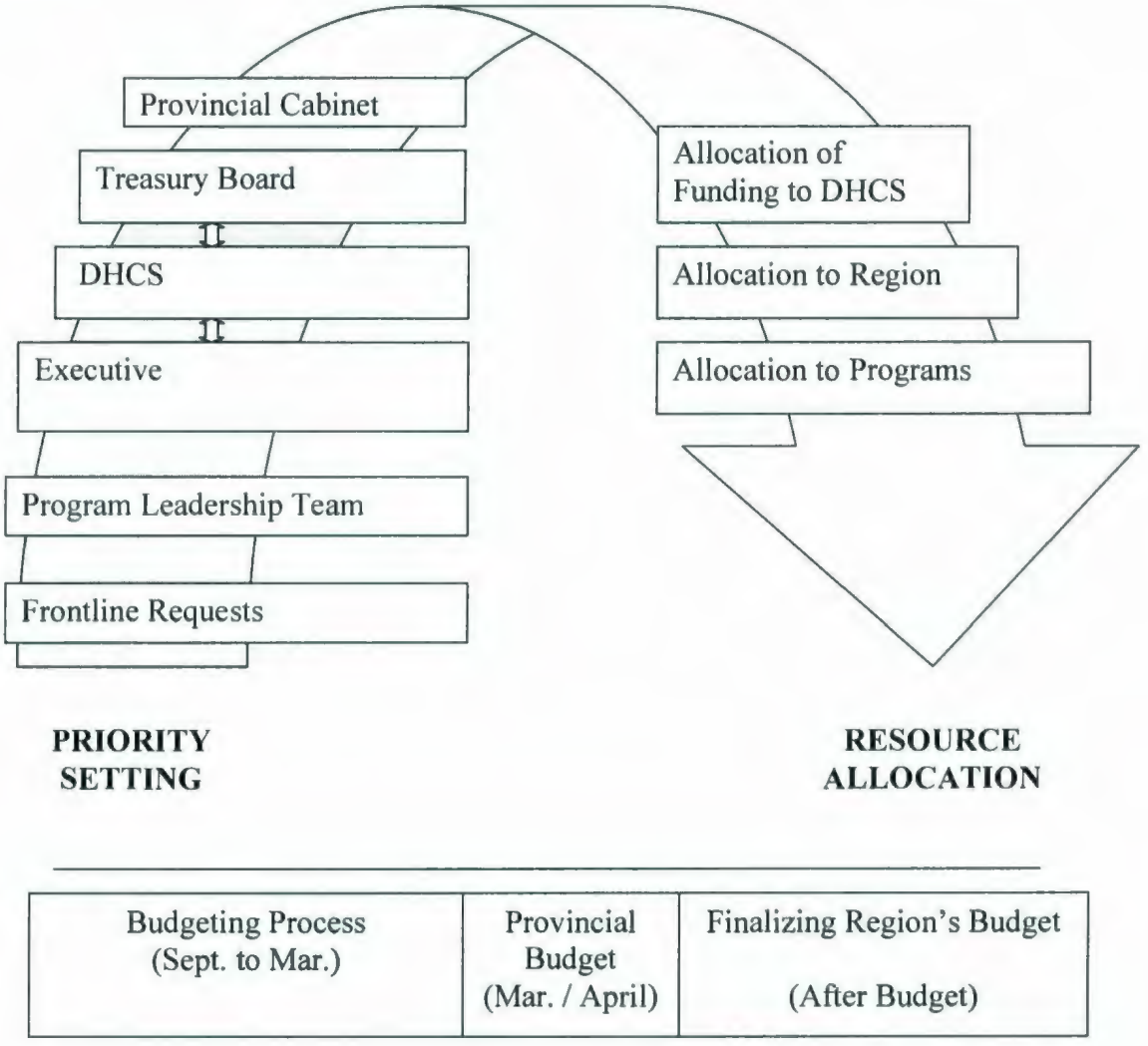


Figure 5.2: Priority Setting and Resource Allocation Cycle at Region B

DHCS does have some discretion to fund initiatives outside of the budgeting process. It may even request additional funds from Treasury Board outside of the normal budgeting cycle.

Factors Influencing Budget Priorities

Participants identified a number of factors which influence the region's priorities. The factors identified are listed in *Table 5.3*. At the regional level, what is in the best interests of the patient population is the most important factor in determining budget priorities. Cost and available funding are also factors which have a big influence. If cost increases are seen as unavoidable in the delivery of care, e.g., increases in the cost of pharmaceutics which are provided in hospital, they will be fulfilled. A number of participants reported that the region's executive's philosophy tries to "give everybody [i.e., every program] something ...but not [necessarily] equal." The idea is that no program area is left without having at least one of its priorities fulfilled. This requires, of course, that additional funding is made available by the province. Whether the investment in technology or new service allows for offsetting savings is an important factor. Another key consideration is whether the saving can actually be recouped or whether pent-up demand will use the resources which are saved. Resource allocations tied to retaining or recruiting physicians is another issue. Wait lists and other internal operational measures clearly influence priorities. Meeting national standards of care was mentioned by a number of participants as an important factor. There is a consideration also of whether there is a gap in service or whether it is a service the region should be providing and currently is not. Finally, there is a concern with whether the money is going to be used effectively to address the problems facing the region. As one participant said, the executive always ask "Is it going to be effective in saving money? Is it going to be a better service? Is it going to address one of the issues we have facing us now?"

Table 5.3: Factors Identified as Determining Budget Priorities

• Best interest of the patient • Cost / Institutional impact • Available funding • Unavoidable costs • Operational pressures (Waiting lists / Wait times) • Provincial / National initiatives • National standards of care • Results in resources which are saved and not used for other services • Gaps in service • Needs identified by frontline staff • Technology / Changes in clinical practice • Offsetting savings • Retention and recruitment issues • Effectively address the region's needs

Procurement

The procurement of new equipment is primarily managed at the program level. Once there is a budget allocation for new equipment, the program leadership team would establish a working group, whose job it is to recommend the most appropriate piece of equipment to purchase. This working group would usually consist of a physician working in the area, technicians who would work on the equipment and someone on the program's administrative side. There would be discussions around the necessary requirements for the equipment and a list of added features it would be desirable for the equipment to have. There would usually be some opportunity for everyone in the program area to contribute their opinions on what features they would like the equipment to have. This program-

wide consultation would be usually through e-mails or during a general departmental meeting.

Once the basic requirements of the equipment are determined by the working group, the program leadership team would then contact the vendors. There are two ways vendors can be contacted. Sometimes vendors are asked to provide information on the type of equipment they have available. Other times the working group would develop a RFP and send it to the prospective vendors. Once the vendors identify the available equipment options, the working group would assess the different options. The sales people for the different vendors may be brought in to make presentations to the working group. The working group would then shortlist two or three pieces of equipment which meet both the program's needs and the resources allocated for the equipment. For expensive equipment purchases, the department may select a small group to do site visits to see the equipment operating in a clinical environment. For smaller purchases, the working group may ask the vendor to bring the machines in for a trial. After assessing the performance of the equipment and considering other factors, such as compatibility with other equipment, the working group would recommend one piece of equipment to the program's leadership team. Once the leadership team approved this selection, the recommendation is forwarded to the department of finance, who, if they approve the selection, will arrange the purchase.

5.4 Resource Allocation Issues at Region B

The executive of Region B are ultimately responsible for all the resource allocations made within their region. In determining the region's budget, the executive would allocate resources across the different program areas. It would make program level decisions which have a substantial impact on the region's operations or have substantial costs associated with them. The executive may also decide on any issue which is particularly contentious and in this way could be involved in decisions concerning the care individual patients receive. For Region B, the DHCS may also become involved in making some of these decisions.

The executive's decision making can be described as closed-door / top-down, in that it is only the executive who makes the decision and its decisions are then imposed on the other levels of the region. The executive does aim however to bring in numerous other perspectives into the budgeting process.

5.4.1 Region B and Need

At the executive level, determinations of need would be based primarily on estimates from the clinical departments. As one management participant said, "the system has typically ...left it up to the physicians to determine the patient population foremost in these things." Internal utilization data is also used. It is sometimes difficult to determine the level of demand for a new service or new piece of equipment. In these cases, the region's management may contact other regions in the country which already perform the service in order to discuss current usage and trends in usage patterns. Participants also

reported that the region has in the past used formal needs assessments to help in the planning of services for particular parts of the region.

5.4.2 Region B and Evidence

The type and amount of evidence looked at by Region B's executive in making resource allocation decisions varies depending on the service under consideration. One participant said that in the past there have been cases in which "clinical effectiveness wasn't clinically assessed or appraised" before a service was approved. This situation is becoming rarer in Region B. For new technologies, the executive may ask for an evaluation report to determine what is known about the effectiveness and impact of the technology before it is adopted, especially for a technology the executive are not fairly familiar with.

The executive may review evidence from numerous sources. They would look at independent technology assessments, existing research studies, and the experiences in other centers across the country. Another important source of evidence is internal data, especially when it is compared with national standards. Region B's internal data collection system has been described as "fairly sophisticated" and is able to calculate the number of patient days of each program, the average hours of care per patient day, workload per patient and anticipated workload. The opinions of clinical staff are also seen as an important source of evidence.

Some participants criticized the quality of research which is available to base decisions on. One participant said that a lot of research does not easily translate in to operational outcomes, e.g., readmission rates, which are important for regional health authorities. Another participant pointed to the quality of research as a problem, especially the lack of double blind studies and the short duration of many research projects.

Participants also touched on the political nature of evidence. One participant complained that advocacy groups often simply dispute research evidence that does not support their views. Often the political pressure of these groups wins out over contrary evidence for effectiveness. Another participant talked about the importance of evidence for putting the brakes on physicians' demands for new services. Other participants painted a less fractious relationship between the executive and physicians over evidence, based on ensuring the best quality of care. As one participant said,

> "if you can show the evidence is there, then they'll go with the evidence. Doctors, pharmacists and these people - they're generally... they think like scientists. They have a patient advocacy role as well, but they'll still do so in the sense of the scientific thinking. They don't want to give their patients something that's not going to work or prescribed a benefit."

5.4.3 Region B and Cost

The region has in the past tried to do some cost-impact analysis for certain decisions. One regional official admitted that the region does not do as much of this type of analysis as it should. The focus of any analysis is on the budgetary implications of offering new services or in purchasing new equipment. A key focus would be on whether there can be

operational savings or efficiencies gained. Formal cost-effectiveness studies are rarely considered.

While not explicitly activity-based budgeting, in that budget allocations are not tied directly to activity outcomes, the department of finance closely watch output data for each program and will investigate if a program is not meeting its expected level of out put. Budget analysts meet with the program manager every month. Variance analysis is performed for every department.

Costs are determined mostly by using internal data, although sometimes vendors will be contacted. Operational costs are often compared with other regional authorities across the country to identify levels of variance.

5.4.4 Region B and Accountability

Provincial officials and Region B's management both stressed the need to be accountable for the allocation of public funds. A good deal of this accountability is provided by the overall government structure. The provincial government appoints a board of trustees who monitor the region's operations and issue an annual report on the region's activities. Funds for the region come from the provincial government, which provides a number of controls. The provincial budgeting process is fairly transparent and is overseen by the provincial legislature. At the departmental level, DHCS officials consult with community stakeholders and other interest groups about their wants and concerns with the health care system as a part of its budgeting process. The provincial Auditor General has the

authority to review all government spending, including the spending of the regional health authorities. Likewise, the Minister of Health can inquire about any aspect of the health care system, including about the region's operations. The province is in the process of passing the *Transparency and Accountability Act* (2004), which is meant to give, as one participant described it, the "public has a better sense and understanding of what are we really doing." One of the requirements of this new legislation is for all government departments and agencies, including Region B and DHCS, to submit three-year business plans outlining their operational objectives. The new legislation also aims to clarify the roles of the departments and the regions. Finally, all purchasing by Region B needs to be done in accordance with the *Public Tendering Act* (1998).

The region itself has a number of measures which further help to ensure accountability to the public. The region has worked with stakeholder groups to determine their concerns about the delivery of care in their local communities. The resource allocation pilot project, described in section 5.4.6, also hopes ultimately to engage the public. Participants said, however, that the other side of accountability entails ensuring public concerns, expressed by interest groups, do not drive the agenda, overriding evidence for effectiveness or what is in the best interest of the entire patient population. The region has also used external firms to audit the region's operations and evaluate the region's spending controls.

A number of participants discussed the region's move to tie funding more closely to outcome measures as increasing accountability throughout the organization. One

participant said that this focus on outcome measures is needed because the executive have no day-to-day control over how services are delivered in the frontline departments. Two other participants pointed out that while there is a focus on production measures, there is nothing which ties spending to health outcomes. Focusing accountability on health outcomes may force more funding into prevention and community care.

Participants said that Region B is usually very open to sharing information with the public. There are annual general meetings outlining the region's finances and its strategic plan. One participant suggested that current wait lists for MRI and other services will be soon published on the region's website. Another participant said, "if somebody calls and asks anything financial, I keep saying it's one set of books, public information, anybody can know this anytime so, you know, judge yourself accordingly when you're spending."

5.4.5 Region B and Ethics

One participant described Region B as basically "an ethics-based organization." Participants often said that the region's corporate values do have a practical import, with the region's executive often being criticized when the organization has failed to meet the ethical standards they have set for themselves.

There has been some discussion at the executive level about the principles which should be used to allocate resources and about the fair allocation of resources. The executive has also discussed other ethical issues related to resource allocation. For example, should the region give preferential access to Workers Compensation patients because they're paying

for their care? To what extent should a person's lifestyle affect the type of treatments they should be eligible to receive?

One member of the executive team is responsible for the region's ethics committee. Beyond dealing with ethical issues relating to clinical practice, the committee has been particularly concerned with ensuring that resource are allocated fairly across expensive, high profile programs, e.g., diagnostics, cardiac care, and programs with lesser profiles, e.g., mental health, health promotion. The committee has also reviewed some of the allocation decisions the region has had to face in the past. The region's board of trustees asked the ethics committee to try and develop an ethical framework for making resource allocation decisions. The pilot project discussed in *Section 5.4.6* came out of this attempt to establish an ethical framework. The ethics committee has also organized workshops with the program leadership teams which consider how to fairly allocate health care resources. One participant said that one of the challenges for the region is that there really has not been a wider public discussion about the principles which should be used to allocate health care resources and what should be in and out of the Medicare basket.

5.4.6 Initiatives Improving Resource Allocation at Region B

Resource Allocation Pilot Project

Region B is currently conducting a pilot project to improve its resource allocation processes. The pilot project has been developed from an ethical perspective. It was the region's ethics committee which called for a more systematic approach to resource

allocation and for a better articulation of the principles which should drive the allocation of resources in the region.

Traditionally, some programs have ignored their program's budget limits, refusing to limit care to patients. The pilot project aims to make the programs more accountable for any cost overruns within their program area. As one participant said, "anyone can run the ship if you have unlimited resources; but you don't have unlimited resources, so now manage that." The new pilot project requires that programs stay within their assigned budgets. The programs can shift resources around their program to release resources for new initiatives.

The pilot project began with a facilitator meeting with the managers of each program to discuss their budget situation and how they currently set priorities. A particular concern was with any recurring deficits. There was also a discussion of the ethical principles used to make allocation decisions. This discussion focused on whether the program is listening to vulnerable people and what principles are driving its resource allocations. The pilot project aims to bring these ethical considerations to the forefront in discussions about how resources are allocated at the program level. Following these discussions, the facilitator developed an ethical template which will, in coming years, be incorporated into the region's standard budget template.

Another key feature of the pilot program is that requests for additional resources need to be discussed and agreed to by the clinical chiefs of all programs. These interdepartmental

discussions are meant to help the program management teams to agree on priorities which are often hard to compare. The goal is for some level of consensus, across the program areas, about what the region's priorities should be going forward. The pilot project also aims to better manage the institutional impact of changes in program areas by alerting other affected programs before the changes are implemented.

Physician impact analysis

When programs request to bring in a new physician, the clinical chief is required to fill out a physician impact analysis form. All of the programs affected by the new physician need to sign off on the form.

5.4.7 Overview of Resource Allocation at the Executive Level of Region B

Table 5.4 summarizes some of the information presented in sections 5.4 to section 5.4.6.

Table 5.4: Overview of Resource Allocation at the Executive Level of Region B

Resource Allocation Decisions	Across program areas; within programs and occasionally, in clinical circumstances. Inclusive, but ultimately closed-door, top-down. Often the DHCS in involved.
Need	Determined by staff, stakeholder reports, internal data, consultations with other provider regions, and the use of formal needs assessments.
Evidence	Varies depending on issue under consideration. New and innovative technologies usually require a good deal of information. Internal data and expert opinion are important types of evidence. Evidence can be contested and politicized.
Cost	Primarily concerned with budget impact, determined primarily by internal data, although sometimes vendors are contacted. Cost comparisons often made with other health regions.
Accountability	General government structure; annual reports and public reporting; increasingly tying funding to operational output, although not health outcomes; openness to requests for information.
Ethics	Sees itself as an ethics-based organization; a good deal of reflection by the ethical aspects of allocation decisions; a pilot project is attempting to identify the principles which resource allocations and priority setting in the region should accord with.
Innovations for Improving Resource Allocation	• Resource Allocation Pilot Project • Physician impact analysis

5.5 Resource Allocation within the Diagnostics Program

In all three regions, endovascular coiling and MRI are both budgeted through the diagnostics program. As with Region A, it is useful to begin our discussion of resource allocation in these two areas in Region B by examining how resources are allocated within this program generally.

Decision Structure

The diagnostics program is responsible for providing diagnostic services throughout Region B. The program has capabilities in most modalities of diagnostic imaging. There are less than 30 radiologists currently working in the program.

The program's leadership team is made up of a clinical chief and a program manager. The clinical chief is responsible for all clinical and quality of care issues. The clinical chief is supported by four divisional chiefs, who report on the operations at different sites. The program manager has responsibility for the administrative aspects of the program, including managing the human resources aspects of program, equipment, delivery of service, and the location of service. Although they have different responsibilities, the leadership team works closely together on most important issues for the program. Both the clinical chief and the program manager report to the vice-president responsible for medical and diagnostics services.

Because radiologists work purely on a fee-for-service basis, they have a great deal more autonomy then many other physicians who work in the region. For example, the radiologists would identify the need for another radiologist within their program and would not have to seek approval from the region. Radiologists also have a good deal of autonomy in how they organize their work. As one participant said, the radiologists are "pure fee for service - just happen to work in the hospital." The region identifies the level of work they need done, and the leave it to the radiologists to determine how that work is actually carried out.

The program's decision making structure is outlined in *Figure 5.3*.

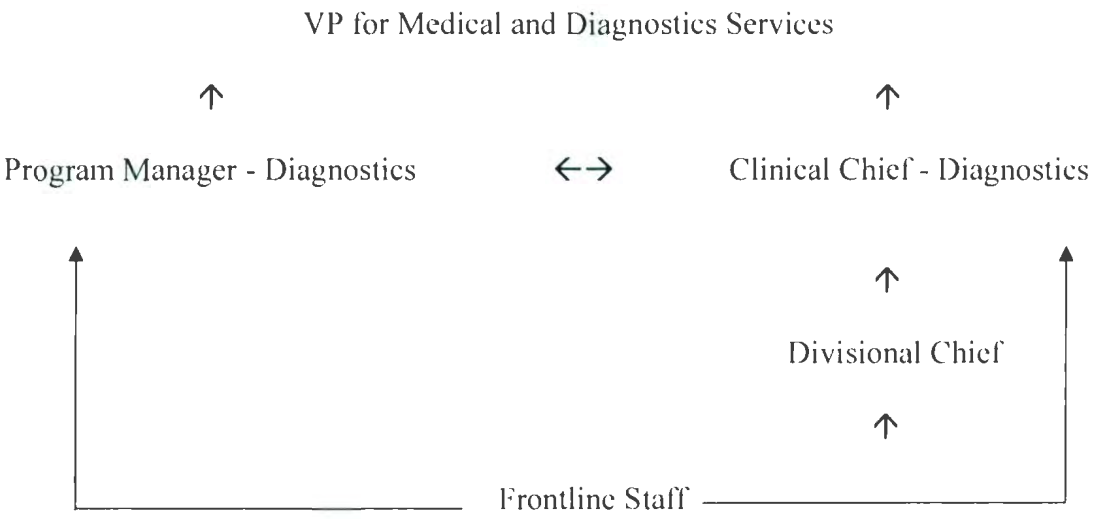


Figure 5.3: Decision Making Structure of the Diagnostics Program

Priority Setting

The clinical chief, the program manager, and divisional chiefs meet regularly to discuss the program's resource needs. The various sites are small enough that informal discussion amongst the radiologists is sufficient for the divisional chiefs to identify their division's resource needs. Some physicians will also discuss their resource needs directly with either the program manager or the clinical chief. There are also staff meetings in which resource concerns are discussed.

The program maintains an ongoing five-year priority list for both the expansion of services and replacement of equipment. The priority setting process is fairly consensus-based, in that the priority list is usually agreed to by the entire leadership team. In terms of resource allocation, the two main issues the diagnostics program deal with are: 1) managing wait lists and patient demand, and 2) trying to keep up-to-date with equipment. Keeping up-to-date equipment has implications for other areas, e.g., accreditation, staff retention. Another consideration for the diagnostics program is that it often cannot control the demand for its services, due to the fact that requisitions come internally through other clinical programs. As one participant described the situation,

> "We have a difficulty containing the referral rate and so, as a result, our only option to reduce our expenditures either is not provide the service, which is not looked upon favourably by the public or the patient who's waiting to have an examination... the only other way to do is push our wait times so we do less... you know, we do less over a period of time, so it spreads out the expenditures."

Because demand for diagnostic services often originates outside of the program area, it is often the case that added demand comes before there is a budget allocation to fund the additional service. In some cases, the department may try to juggle its resources and provide the service, waiting until the next budgeting cycle to request additional resources. Other times, the diagnostics program will not provide the service until there is additional funding already in place.

Another factor influencing demand is that radiologists are continuing to do more procedures which were traditionally performed in other areas, e.g., endovascular coilings, which were traditionally treated in surgery. While increasingly these services are being

provided by the diagnostics program, funding for these services has not usually flowed back to diagnostics from the other programs, resulting in a further deficit for the diagnostics program. There is a recognition that often the diagnostics is not given sufficient resources to carry out all of the services it is asked to do. The region requires the program to provide the service, so that the program often shows a deficit at the end of the fiscal year.

The leadership team would forward to the finance department its requests for resources for the coming fiscal year as part of the region's annual budgeting process. The program also forwards an emergency list of resource requests the program leadership team sees as necessary to maintain a level of core services, e.g., funds needed to replace equipment which has broken down. These emergency requests may be made at any point during the year. Because of resource constraints, new services usually take a number of years to be approved. Often the new service has to be recognized as the Canadian standard of care or be demanded by an external accrediting agency before resources are approved.

The executive may identify a couple of new services which it is considering funding. It may then ask the program's leadership team to develop the business case for these new services, especially if the executive are not sufficiently familiar with the service. The business case would include the clinical indication, the expected patient populations, costs, and the expected efficiencies gains. In some cases, this business case needs to include some account of how savings in operational funds will offset the costs of the new program. Often the business case would not include evidence of effectiveness because, as

one participant said, "the thing about here in Newfoundland is what happens in other places becomes standard before it's here.... Everybody else had one. So it's common knowledge [that it is effective]."

Once an allocation is received for a new piece of equipment, the program leadership team will meet with specialists in the area the equipment is for. Through these discussions, an assessment team will be identified by the program and a wish list for that piece of equipment developed. Once the specifications for the new equipment have been identified, the vendors will be contacted either through informally or using a RFP. The assessment team will then analyze the options. Vendors may be invited in to demonstrate their equipment. A short list would be determined. For major equipment purchases, site visits may be arranged. The equipment that best meets the programs needs within the assigned budget will be recommended by the program to the region's administration, who then arrange for the purchase.

5.6 Endovascular Coiling at Region B

Region B currently does not offer endovascular coiling. There has been, however, a good deal of discussion lately about whether the region should establish a program. One participant summed up the current situation by saying "the tide is pushing towards there [being a program established here]. I would argue that. If we're not there already, we're very close to that - to saying, okay, well, this is not an option anymore. We need to be doing this." Another participant was less certain, saying that "the volumes and the cost to provide neurocoiling is still questionable with regards to, do you send them to Halifax?

Do you spend the money and set up a program here?" The establishment of a program will depend on the provincial government being willing to provide funding, given that it is beyond the capacity of the region to establish the program itself. As a member of the executive said, "it [endovascular coiling] might be the right thing to do - [but] we have no ability to get that kind of money. So unless the ministry bites, we're not going there."

5.6.1 Resource Allocation for Endovascular Coiling

The request for an endovascular coiling program was first raised by neurosurgeons who were seeing cerebral aneurysm patients they felt were better treated through neurocoiling. Radiologists also supported the establishment of an endovascular coiling program. The formal proposal for the new program was sent to the executive from the diagnostics program as part of its annual budgetary request. The neurosurgery program also sent a letter to the vice-president of Medical Affairs, outlining their program's support for a coiling program. The reasons identified by frontline staff for the establishment of an endovascular coiling program are listed in *Table 5.5*.

Table 5.5: Reasons Cited by Frontline Staff in Support an Endovascular Coiling Program at Region B

- These are critically ill patients in desperate need for care.
- These are medically unstable patients, who it is often risky to transport.
- Legal issues around not providing the best care.
- There are an abnormally high number of Newfoundland patients needing treatment for cerebral aneurysms.
- Family travel costs not sufficiently covered by MCP.
- Dangerous situations have been experienced locally when transporting patients.
- Accepted practice across the country.
- The trend in neurosurgery is towards less invasive procedures.
- Recommendation from colleagues in Halifax about the likely increase in numbers.
- Trained staff already working in the organization.
- Another tool which is needed in dealing with neurological cases.

Once the executive received the request to start an endovascular coiling program, they met with the neurosurgeons and interventionalist radiologists to discuss the proposal. The executive committed to examining the proposal more closely. Part of this examination was the development of internal document outlining the evidence, pros and cons, costs and options regarding endovascular coiling. The executive included this planning document in its submission to the DHCS for funding for the program.

The discussions amongst the executive and between the executive and officials from DHCS have focused on a number of issues. Participants said that the most important factor is quality of care. Currently, patients who need to be coiled are sent to either Halifax or Ontario. These patients are in critical condition and there are concerns about the effect sending them away for care may have on their overall health. There are issues about whether travel difficulties, e.g., snowstorms, may delay care, again adversely affecting patient outcomes. The province has had a couple of nearly disastrous situations with moving aneurysm patients in the past. For medically unstable cases, the patient may be left with no treatment option if the service is not provided locally.

Another factor discussed is the level of need. It is estimated that the potential patient population for coiling will be very small. One participant estimated that the province currently sends less than ten people out of province to be coiled annually. Based on discussions with other health regions, it is estimated that Region B would likely coil between twenty and thirty patients annually if it establishes a program. The potential patient population affects the quality of care. There is a good deal of discussion about whether the potential patient population is great enough so that radiologists will be able to maintain their skill set.

Another important consideration is the cost implications of either having or not having the program. If the program is not provided locally, the region and the province have to pay for patients to be sent and cared for in another province. There are also the cost

saving resulting from the fact that patients recover faster from endovascular coiling than from open brain surgery, so that they are able to leave hospital faster. These costs will be saved if Region B decides to establish the service. But the costs of establishing a program are considerable. The region would have to purchase a new bi-plane angiograph, which is estimated to cost between two and three million dollars. The initial inventory of coils would cost in the range of $300,000 to $500,000. There is the cost of training staff. There is also the issue of cost savings not being realized for the region, because of pent up demand for the surgery time saved by treating the aneurysms outside of the operating room. There are considerations about the added pressures on the home care system by having patients rehabilitate longer in the community. Another factor is the cost implications of having a new angiograph machine. Only a small percentage of the angiograph's time is going to be used doing coilings. One participant said that the new angiograph may have another $500,000 in operating costs associated with it outside of the costs from doing coilings just because it would be idle and available for other services.

Apart from the cost implications, a range of system impacts for establishing an endovascular coiling program were considered. For example, service implications, support implications, and impacts across programs were all considered. An important consideration is how the establishment of an endovascular coiling program may affect the use of anesthesiologists.

The DHCS are currently analyzing the region's proposal. The department's medical people will examine the level of need for the service. They will determine the level of ongoing funding and one-time funding required to establish and to run the program. If approved, the department may fund the program immediately. They may fund it in the coming budget year. They may have to go to Treasury Board to approve additional funds for the program. There is also some consideration given by the region to asking its hospital foundation to pay for the angiograph, thereby limiting the initial cost of the program to the province.

There is a sense on the part of the executive that the discussion around endovascular coiling represents an advancement in how the region allocates resources. As one participant said, "in the past. ...I think we would've started... we would've come up with a way to get a bi-plane [angiograph]. ...then all of a sudden we could do neurocoiling; and then, all of a sudden, well, where the hell did that [an endovascular coiling program] come from." The level of discussion with the province and frontline staff, and especially the use of an internal document to review the evidence and major implications of the different options, was seen as adding a level of sophistication to how resources for new programs are allocated. Participants also felt that the process has been fairly evidence-based.

There has been, however, a level of frustration on the part of some of the physician staff with the region's refusal to approve the program. Some physicians said they were considering directly lobbying the provincial government and media over this issue. In

other words, they are considering taking their concerns outside of the region's priority setting process.

5.6.2 Resource Allocation Issues around Endovascular Coiling

The main resource allocation question for Region B is whether to begin an endovascular coiling program. This decision is focused on the combined decision of whether to purchase an inventory of coils and a new bi-plane angiograph, as well as cover the operational costs of the program.

5.6.3 Endovascular Coiling and Need

Need is determined by examining internal data on the number of aneurysm cases treated annually by the region and the number of patients sent from the region to other provinces to get their aneurysms coiled. Estimates from frontline staff and discussions with other health regions are also used to help estimate the demand for the service. Next to estimating the likely demand for the service, the executive also considered what the maximum demand for the service could be. Often a program starts by doing only the most serious cases, but once the service is established, it is used for a much wider range of cases.

5.6.4 Endovascular Coiling and Evidence

In evaluating whether the region should start an endovascular project, Region B developed an internal planning document to help focus the discussion between frontline staff, the regional executive and the provincial government. This document reflected the

key areas the executive wanted information about in making its decision: the likely patient population, the number of patients being sent out of the province for the service, the pros and cons of coiling vs. alternative treatment options, evidence for the effectiveness of endovascular coiling, what costs are associated with the different treatment options, and what are the national standards of care. Essentially, the document tried to capture what the main system impacts would be for starting an endovascular coiling program.

There seems to be an increased use of evidence in the decision making around endovascular coiling, especially at the regional executive level. One participant said that

> "We spent some time gathering a lot of evidence on that in terms of the value of neurocoiling to make sure that it simply once of those issues that was being promoted a particular physician. I think we've gotten a bit gun shy over the years that we've jumped too quickly in bringing things in and found out that maybe the value that we see wasn't great or the numbers weren't large enough."

A number of executive participants said the reason for this increased focus on evidence was an attempt to improve the decision making around resource allocation.

The frontline staff were invited to review the planning document and contribute to it. One of the executive's findings is that there is relatively little clinical trial data on the effectiveness of endovascular coiling. This has caused some tension with frontline staff, who see coiling as a standard and proven practice. From the perspective of expert staff, the coiling is safe and often preferable option for treating cerebral aneurysms, so there was no question for them about its effectiveness, even given the absence of research data.

5.6.5 Endovascular Coiling and Cost

Cost is determined by internal data, estimates of frontline staff and discussions with other health regions and vendors. For the basis of comparison, costs have also been calculated for sending patients out of the province for treatment.

5.6.6 Endovascular Coiling and Accountability

Given that the program has not been established, there are no special accountability measures for endovascular coiling. The decision whether to establish an endovascular coiling program would be made in accordance with the accountability measures put in place by the provincial government and Region B outlined in *Section 5.4.4*.

5.6.7 Endovascular Coiling and Ethics

Generally, there has been little discussion of the ethics of specifically starting an endovascular coiling program. One participant did raise the issue of whether resources should be directed to a few critically ill patients or whether those resources would be better spent in other clinical areas. But this issue has not been raised in the discussions about whether the region should establish a program.

5.6.8 Overview of Endovascular Coiling

Table 5.6 provides an overview of the usage of endovascular coiling in Region B and how the six component elements are handled by Region B with regard to endovascular coiling.

Table 5.6: Overview of Endovascular Coiling

Usage	Currently not available.
Resource Allocation Decisions	Whether to begin performing endovascular coiling within the region. This decision is focused on the combined decision to purchase an inventory of coils, a bi-plane angiograph and train staff.
Need	Determined by internal data, estimates of frontline staff and discussions with other health regions.
Evidence	The executive have developed an internal report to examine the evidence for the treatment's effectiveness and the program's likely impact on the region. Seen as an effective treatment by frontline staff, even though there is an absence of research on the procedure.
Cost	Determined by internal data, estimates of frontline staff and discussions with other health regions and vendors.
Accountability	No measures specific to program.
Ethics	Not discussed in deciding whether to start a program. Wider consideration of whether resources should be directed to a few critically ill patients or whether the resources would be better spent in other clinical areas.

5.7 MRI in Newfoundland

Newfoundland has two MRI scanners. MRI capacity has been a long standing issue for the province, due to the low number of machines compared to other provinces. As one participant said, "we're behind the path, probably, if you look at the number of MRIs that are in other provinces, you know. We have, well, two now; but if you can go to a centre like Halifax and there's four ...and then a private one besides that, we're clearly behind

the path." In 2005, Newfoundland's scan rate was the lowest in the country at 8.5 scans for every 1,000 people in the province (CIHI, 2005). A review by the provincial government recommended that the province should have at least four MRI. The province is planning to use federal funds from the Health Care Accord (2003) to purchase a third MRI in the near future.

MRI in Region B

Region B operates one of the province's two MRIs. It performs around 5000 MRI scans annually.

5.7.1 Resource Allocation for MRI

The decision whether to expand MRI capacity would be made by the provincial government, with some input from the health regions. Participants said that the decision to purchase a new MRI involves three questions. The first is the decision to fund a new machine. This decision is made by the provincial cabinet. Given the shortage of MRI scanners in the province, there is always a great deal of pressure on the provincial government to purchase new MRIs. There are also a number of groups who are regularly lobbying the government to expand MRI capacity in the province. These groups would include physicians, the executive of the regions, provincial and national medical societies.

When the provincial government feels that it may have available funding to purchase a new MRI, officials from the DHCS would discuss the possibility of a new MRI with the executive of the appropriate health region. The region's executive would then ask the

diagnostics program to develop a proposal for a new scanner. The proposal would identify the current level of the need and the approximate cost, including human resources costs, installation costs and the cost of the equipment. There will be some discussion with vendors to estimate the cost of the machine to be included in the proposal. Consideration would also be given to the site where the machine is proposed to be located, due to the influence the site may have on the overall costs and ultimate which the machine is purchased.

The second question is where to locate the MRI. This decision is seen as a politically sensitive one in the province. The provincial cabinet would decide which health region and probably which city a new scanner will be located. The decision would be based on a number of factors. Political considerations, including perceived fairness in the allocation of health care resources across the province would be a major consideration. The fact that the main teaching and most tertiary care services, including all tertiary pediatric care, are provided in St. John's is another consideration. Physicians, patients and municipal politicians would also likely lobby government for their preferred location.

If there are two possible sites within a city, the region would decide which site makes the most sense to locate the scanner. The region would consider what is best for the patient population, the cost of locating the machine at different facilities, personnel considerations, the time it will take to install the machine at different sites and issues related to space. Space issues are important in deciding on the location of an MRI. As one participant pointed out, "one of the things we have to look at with MR is the field... or

the magnetic field around it - so that one can't put it too close to an elevator, too close to where cars or trucks are moving at loading docks or stuff." Radiologists in the region would be consulted about where they think the MRI should be located. Outside consultants may be used to evaluate the different sites. One participant summed up the decision about which facility to locate a new machine as one in which the executive ask "is there a direct clinical issue that says one site should have it over another? And if there's not a clear, clinical benefit, then it'll go ...to the facilities that can most easily accept it."

The third decision is the procurement of the MRI. The purchase of an MRI would generally follow the method of procurement identified in *Section 5.3.2* and *Section 5.5*. There are, however, a number of issues unique to MRI. Large capital purchases, like the purchase of an MRI, involve questions of whether it is better to lease or buy the equipment and whether it is best to sign extended service agreements. The finance department will likely assist the program manager in making these types of decisions. There are also issues around the type of magnet which is purchased. The power of the magnet determines the type of cases the machine is able to scan. The power of the magnet will also affect the rate at which cases can be scanned. Before purchasing an MRI, the diagnostics program would develop a plan of the type and number of cases it plans to scan with the new machine. Many of these parameters would be determined by, or at least discussed with, the executive in advance of the sending out of an RFP.

In Region B, there is little discussion about changing the operational level of the current MRI. The machine currently operates 16 hours a day, five days a week. The region felt that this is currently its maximum capacity due to human resource constraints, most notably the staff's unwillingness to regularly work longer hours. There are also issues relating to collective agreements, which make expanding the service beyond the current operating time difficult and inefficient.

The schedule for the MRI is determined by the program's clinical chief. The divisional chiefs are also involved in determining the schedule. The radiologists would determine the type of cases they feel need to be scanned on the machine, e.g., head, chests, and allocate so many scans to each type. The schedule would also allow for a particular number of emergency MRI scans.

There were a number of other issues raised during the interviews regarding the allocation of resources for MRI. One participant said that too much emphasis is placed on MRI in the region. The participant said that "I'll say this almost facetiously, but I think there's a substance of truth to it - the MRI ...is more important than the patient. ...we spend more time and energy trying to fit the schedule of the MRI than the schedule of a sick patient who goes through to that MRI." Another issue is that there is a perception amongst some staff that micro-level decisions can be too easily influenced by political or media pressure. Some frontline radiologists complained that even at the level of scheduling, they felt that they did not have much influence on the decision making process. Another issue mentioned numerous times was the level of pent up demand for MRI. Staff said

that many cases which are commonly diagnosed with MRI in other provinces are not scanned in this province, due to a lack of MRI capacity. As one participant said, "I don't think the hospital realizes how much we're not doing." This need to increase the scope of MRI usage raises a difficult allocation question when new MRI capacity becomes available. As one participant said, "should we continue not doing stuff that we should be doing to address the wait list or should we try to do some things that we're not doing that should be done at the expense of maintaining a long wait list." As MRI capacity is being expanded across the country, there is also an issue of ensuring the appropriate number of technicians is available within the region.

Guidelines for MRI

There are no formal guidelines on MRI usage in Region B. Patients need a referral from a specialist to obtain a MRI scan. These requisitions are then reviewed by a radiologist. The reviewing radiologist classifies the scan as either emergency, urgent, or regular. These classifications are used to prioritize requisitions. In making these categorizations, radiologists solely rely on the requisition orders forward by physicians. These categorizations thus depend to some extent on the requisitioning physicians being willing to not manipulate the requisitions to ensure faster service for his or her patients. The region has considered putting in some type of practice guidelines at the source of ordering, but there has been no action taken due to the complications involved in trying to use and enforce the guidelines. There are guidelines from the Canadian Association of Radiologists which are used by the radiologists in Region B to determinate the most appropriate modality for different conditions.

5.7.2 Resource Allocation Issues around MRI

Two of the most important decisions regarding MRI are 1) the decision whether to purchase a new scanner and 2) where to locate a new MRI scanner. Both of these decisions are primarily made by the provincial cabinet. The provincial cabinet would decide whether the province buys a new scanner. The provincial cabinet would decide which health region and probably which city a new scanner will be located. If there are two possible sites within a city that can house an MRI scan, the region would most likely decide which site it makes the most sense to locate the scan in. These decisions would involve discussions with a number of stakeholders, but in the end would be closed-door, top-down. Procurement would be mostly determined by the diagnostics program and the regional executive.

Because the current MRI is seen as working at human resource capacity, Region B does not face a question about how many exams to perform. Specialist physicians make requisitions for MRI. Radiologists review these request and determine their level of priority. The clinical chief and the other radiologists determine the scheduling of cases across types of scans.

These resource allocation decisions, who is responsible for making them and how the decisions are made are summarized in *Table 5.7.*

Table 5.7: MRI Resource Allocation Decisions at Region B

Resource Allocation Decisions	Decision Maker	Type of Decision Making
Determine whether to invest in new equipment.	Provincial cabinet	Inclusive, but ultimately closed-door, top-down.
Determine where to locate equipment	Provincial cabinet and regional executive	Inclusive, but ultimately closed-door, top-down.
Procurement of equipment	Diagnostics leadership team and regional executive	Bilateral
Scheduling cases	Clinical chief, divisional chiefs and radiologists	Bilateral
Determine whether to order an MRI	Specialist physicians	Clinical circumstances
Prioritize MRI requisitions	Radiologists	Clinical circumstances

5.7.3 MRI and Need

Almost all participants recognize that MRI capacity in Region B is insufficient to meet the level of need. This calculation of need is based primarily on examining internal wait lists for service. As one participant said "no one is going to question too much that we need a new MRI... The wait list is strong enough that you can kind of look at it... the fact you got to wait all this time for an MRI, and that doesn't seem right." Another important factor influencing the recognition of need for new scanners is benchmarking with the level of service provided in other regions, either through published studies, e.g., CIHI (2005), or through informal discussions with counterparts in other regions.

5.7.4 MRI and Evidence

Participants felt there was little need to review the evidence for the effectiveness of MRI. As one participant said, "MRIs are proven technology. The question around MRI has more to do with how many do you need [than evidence for effectiveness]." Participants said that the scope of use for MRI in Region B is not currently meeting what is currently accepted as the Canadian standard for the range of cases which should be scanned using MRI. Participants said that there were no issues for Region B about expanding MRI usage into what could be seen as experimental usages.

5.7.5 MRI and Cost

The operational cost for MRI is determined by examining internal utilization data. There were no reports of considering the cost-effectiveness of different modalities. The cost of purchasing a new MRI would be determined primarily through discussions with vendors.

5.7.6 MRI and Accountability

Region B is moving towards tying new diagnostics funding to specific numbers of increased scans. For example, the diagnostics program would now likely commit to doing so many new exams as a part of any request for increased funding. These commitments are tied to the number of cases performed, rather than reductions in wait times. The focus on the number of scans is due to the uncertainty of changing wait times because of pent-up demand for MRI in the system. It is still unclear what the ramifications will be for not meeting the operational commitments.

Region B plans to start publishing wait times for MRI on its website. Participants expressed the view that if not done by their own accord, the region would likely soon be required to publicly post wait times as part of the federal – provincial accountability initiatives, e.g., the new federal Health Council.

Participants expressed the view that there is not sufficient MRI capacity to currently meet public expectations or to address problems around wait times. One participant said that this lack of capacity amounted to a failure of being accountable to the public.

5.7.7 MRI and Ethics

There was little discussion about the ethics of MRI allocations. One participant identified the main ethical question was about where to draw the line with regard to limiting MRI use or around how long people need to wait for a scan. The same participant also raised the issue for who is advocating a MRI scan as an ethical issue, but that the person did not think there were many ethical concerns with the running of the current program. Other participants said they never saw any ethical issues specifically related to the MRI program in Region B.

5.7.8 Overview of MRI

Table 5.8 provides an overview of how the five component factors are handled by Region B's MRI program.

Table 5.8: Overview of MRI

Need	Determined by internal usage data and management's judgment of the impact of the numerous factors impacting on MRI demand. Benchmarking with other centres. CIHI data.
Evidence	While it is recognized as a technology which is expanding both in capabilities and range of use, it is generally seen as an accepted, familiar technology. No use of research on effectiveness.
Cost	Analysis of internal costing and usage data; discussions with vendors.
Accountability	Some plans to establish public reporting of wait times. A good deal of media and political.
Ethics	Little ethical considerations.

5.8 Powered Upper Arm Prostheses in Newfoundland

This section examines the issues of 1) the prescription of powered upper arm prostheses in Newfoundland, 2) coverage for prostheses in the province, and 3) the allocation of resources within Region B's prosthetics clinic.

5.8.1 Getting a Powered Upper Arm Prosthesis in Newfoundland

In order to receive a powered upper arm prosthesis, the patient must first be referred by a physician or physiotherapist to meet with a prosthetist. The physician or physiotherapist may suggest either the prosthetics clinic in Region B or a private prosthetist, but it is up to the patient to whom he or she goes. The prosthetist would then make his or her initial assessment of what prosthetic is best suited to the patient. One provider said that during an initial assessment,

> "I look at the person's disability or maybe I should say their abilities. What they've got left, what they can do with it, and then how can we make them the most functional with the existing components. You look at that. Then, I guess, the price... you do look at the price. I certainly wouldn't... once you do your assessment of the patient, you don't say to them, this is what you're going to get. You do have to look at the reality of it and then balance that with an ultimate decision."

Another important factor in determining the most appropriate prosthesis would be the person's lifestyle before the loss of a limb. Prostheses aim to restore functionality. It is important to try to match the prosthesis to the type and level of funetionality the person is used to.

Once the prosthetist determines with the patient what is the most appropriate type of prosthetic, the prosthetist and the financial support staff with look at what coverage the person has or how much he or she can afford. One participant said that a lot of patients are lost at this point in the process. Some patients have too much pride to go through the application for funding. Some patients have no coverage and cannot afford a prosthesis. As the same participant said regarding powered upper arm prostheses, unless the patient has "insurance, is covered by worker compensation or has a big bank account," they likely will not be able to get one. Based on cost considerations, the prosthetist and the patient would revise what is the best type of prosthesis for the patient. Once the most appropriate prosthesis has been identified, the prosthetist would been build and fit the prosthesis and bill either the patient or the third-party insurer.

5.8.2 Coverage for Powered Upper Arm Prostheses in Newfoundland

In Newfoundland, coverage for powered upper arm prostheses is provided through a patchwork of programs. There is no provincial program which covers the cost of medical devices for all residents. Unless the person has private insurance or is covered through third-party programs designed for selected populations, it is likely they will have little or no coverage for prostheses. Workers' Compensation Commission of Newfoundland and Labrador (WCC) provides coverage for employees hurt at work in the province. If the WCC case adjudicator agrees that a myoelectric prosthesis is in the best interest of the client, WCC will pay for the full cost of the prostheses, for training, and provide the client with a clothing allowance, due to the damage the prosthesis can have on clothing. Other patients may be covered by private insurance or by national programs, e.g., War Amps, NIHB. Adults receiving provincial family income support payments can access coverage for medical devices under the DHCS' Special Assistance Program. DHCS may make the person pay for a portion of the cost for their prosthesis if the person is deemed to have the financial means to contribute.

Table 5.9 summarizes the coverage given through the various programs for powered upper arm prostheses in Newfoundland.

Table 5.9: Coverage for Powered Upper Arm Prostheses in Newfoundland

Program	Who is Eligible?	Coverage
WCC	Employees injured at work	Full coverage
DHCS – Special Assistance Program	Recipients of provincial family income support	Full or partial coverage
Private insurance	Depends on policy	Depends on policy
War Amps - CHAMP Program	People up to 18 years of age.	Full coverage
War Amps - Adult Amputee Program	People over 18 of age.	15 % towards the cost of prosthesis up to $1500.00 once every three years
Non-Insured Health Benefits (NIHB)	First Nations and Inuit	Full coverage

Participants expressed some level of frustration that prostheses are billable to the patients, but similar services are not. Participants also reported that patients find it hard to reconcile the fact that services are often provided in a hospital, but they have to pay for the prosthesis and the cost of installation. When patients ask why medical devices are not covered, one participant said "I don't have an answer for it." There were some talks about providing universal coverage for medical devices a few years ago, but it deemed by the provincial government to be too expensive. There has been little recent discussion about expanding coverage.

5.8.3 The Allocation of Resources in the Prosthetics Division

Region B's prosthetics clinic is part of the division of prostheses and orthopedics. The clinic provides a full range of prosthetic and orthotic services, including myoelectric prostheses. The division estimate installing two or three powered upper arm prostheses annually. The division of prostheses and orthopedics is part of Region B's rehabilitation

program. The division manager for orthopedics reports to the program director of rehabilitation. There is also a clinical chief for the program. The decision structure of the program is set out in *Figure 5.4*.

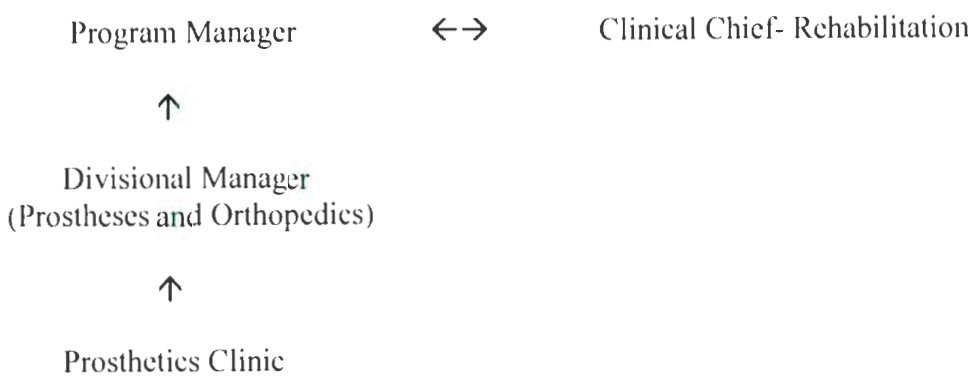


Figure 5.4: Decision Making Structure of the Rehabilitation Program

As part of the region's annual budgeting process, physiotherapists, occupational therapists, physicians and pharmacists working with prosthetic patients will all put forward requests for additional resources to the manager of prostheses and orthopedics. The division manager and the program director of rehabilitation will meet to discuss what the appropriate level of request is for the division. The amount requested is usually between 30% to 50% of the amount requested by frontline staff. One participant said the aim of the budgeting process is to provide "most comprehensive benefit" with the

available resources. This request for additional resources will be sent forward to the executive as part of the overall budgetary request of the program.

Because of the relatively little resources requested in the area of prostheses, the amount of funding going directly to prosthetic work would not be discussed by the executive. The executive would determine how much resources are going to the rehabilitation program and the program's leadership team would allocate resources to the different divisions. The amount which flows through to the prostheses and orthopedics program depends on what is ultimately granted to the rehabilitation program.

Three are three main costs for the division of prostheses and orthopedics. The first is staff costs. The second is the division's budget for prostheses and other medical supplies. The supply budget is not divided by type of prostheses, e.g., orthopedic or upper arm prosthesis. The third major cost is for the replacement of equipment. Purchases of equipment over $2000 go through the capital budgeting process. Participants also identified the need for some renovations to make for a safer work environment. Although this request had been sent forward to the executive for three consecutive budgeting cycles, it has not been fulfilled. The hospital foundation has indicated that it is considering making the improvement. The division would also be expected to recoup a certain level of its expenses from patients.

With regard to treating individual patients, the department often runs into situations in which resource limits negatively impact on care. As one participant said,

> "Well, what you do - you rob Peter to pay Paul. So we're constantly doing a budgetary shuffle; when it comes to need - to a demonstrated need - I still think, when it gets around the table for discussion, the patients who have the greatest needs gets it. I really believe that still happens, and we probably do it better in this province that way."

Because of the shortage of resources, there is some level of shifting budgets at the divisional level to ensure as many patients as possible receive appropriate care.

5.8.4 Resource Allocation Issues around Powered Upper Arm Prosthesis

The decision of who should receive a powered upper arm prosthesis is made by the prosthetist, based a clinical circumstance and lifestyle of the patient. The prosthetist would involve other providers, funders and the patient in making their final decision on what is most appropriate for the patient. This decision would be an example of collegial decision making.

The second question relates to the coverage of powered upper arm prostheses. Newfoundland does not have universal coverage for powered upper arm prostheses. Coverage for powered upper arm prostheses is provided for through a number of programs. There is little communication between these programs to ensure that all people are fully funded for their prostheses.

Region A reported that there was little concern with how resources are allocated around powered upper arm prostheses, due to the fact that the cost of providing care is paid for by third-party insurers and that there are so few installed. The division of prostheses and

orthopedics has made requests to improve the prosthetic clinic and to hire new staff, but these requests have not as yet been fulfilled.

5.8.5 Powered Upper Arm Prosthesis and Evidence

Powered upper arm prostheses are seen as a proven technology and there is little concern expressed about their effectiveness. In terms of who receives a myoelectric prostheses, there are a number of factors looked at. These factors primarily focus on determining the ability of the patient to wear a myoelectric arm, the likelihood that he or she will benefit from a myoelectric prosthesis, and desired functionality for the patient. The information about all of these factors comes from examinations and discussions with the patient.

5.8.6 Powered Upper Arm Prosthesis and Cost

Because of the small number of people requiring myoelectric prostheses, there is no consideration of cost-effectiveness. For budgeting purposed, the net cost of equipment is calculated by examining internal data, checking with suppliers and through discussion with prosthetists.

5.8.7 Powered Upper Arm Prosthesis and Ethics

The only ethical issue identified by participants was the lack of universal coverage and the fact that some people have to forego getting a prosthesis based solely on cost. Participants felt that the exclusion of medical devices from public coverage was based on an arbitrary and historical decision not to extend coverage. In other words, there is no ethical reason for limiting public coverage for medical devices.

5.8.8 Powered Upper Arm Prosthesis and Accountability

There is some discussion within Region B about developing meaningful indicators in the area of prosthetics to evaluate the program's performance, e.g., some scoring system to gauge improvements in patient functionality and quality of service. The indicators need to reflect factors important to the patient. As one participant said, "our system should be around what the patients' needs are, and the outcome measures should reflect the important things in their life." The development of performance indicators is still in the early stages.

Participants expressed frustration at the fact that political and media can sometimes influence the resources which are made available to different projects or to particular patients.

5.8.9 Overview of Powered Upper Arm Prosthesis

Table 5.10 reviews the main components elements relating to powered upper arm prostheses in Newfoundland.

Table 5.10: Overview of Powered Upper Arm Prosthesis in Newfoundland

Usage	2 to 3 annually for province
Resource Allocation Decisions 1) Prescription 2) Coverage 3) Region A	1) Clinical circumstances, collegial 2) No universal public coverage 3) None specific to powered upper arm prostheses
Need	Number who present, patient population small and stable
Evidence	Clinical circumstances of patients. Seen as an effective treatment.
Cost	Internal data and vendor supplied data.
Accountability	Move to develop quality indicators.
Ethics	Lack of coverage.

5.9 Recommendations made in Newfoundland

Participants in Newfoundland identified numerous best practices and made a number of suggestions about how to improve the allocation of health care resources. Resource allocation decisions are complicated because, as one participant said, "no one person has all the data." One area in which participants thought Region B perform well is in making its priority setting processes fairly inclusive, at both at the regional and program levels. There are a number of forums where staff can make an input into the allocation process, e.g., executive meetings, the medical advisory committee, departmental meetings, regional planning days. Region B also tries to build a consensus amongst the providers about what the region's spending priorities should be. Time constraints were seen as an impediment to consensus building. One participant said that the key is working to build a consensus over a number of budget cycles. Part of the value of having a consensus is that it allows everyone to see the reasons why a decision was reached and why, perhaps, their

request was rejected. Others expressed some concern that "we can over do the consensus process." At some point, a decision has to be made and it is not always possible to satisfy all providers.

In terms of who should be involved in the allocation of resources, participants said there is a value in involving technicians and recognizing their expertise, especially in the procurement of new equipment. Another participant said that there is an advantage of lower level decision makers, e.g., divisional chiefs, frontline physicians, seeing the request that is actually sent from their program area to the executive, as kind of a double check. Another participant said that it is important for the executive and board members to consult directly with frontline staff. As the participant said, budget requests "may lose the flavour and it may lack some crispness" by the time it reaches the executive or board level. The participant said that discussing allocations with frontline staff can give the executive a renewed sense of the level of need. There is also a morale bonus which can come from better engaging frontline staff. The same participant went on to say that,

> "As long as you've really had input and a decision has been made, you can understand it; but if a decision is made that concerns you but that you were never asked about, then that's not fair."

The advantage of engaging frontline staff in resource allocation continues even after the budget allocations are made. Discussing the reasons why particular budget allocations were made was seen as an effective way to lessen the negative impacts on staff morale of program level requests which are not fulfilled. Although there is a benefit to involving frontline staff, there was some frustration that there is still not sufficient interaction

between the executive and frontline staff. As one participant complained, "the only time you see people [executive members, board members, politicians] is when their family members are sick."

There was a good deal of discussion about the skills decision makers need to make good resource allocation decisions. One participant said that, "[decision] tools are only as good as the people that use them; and I think that what we have in health care is a real lack of people with that critical skill." Another participant said that, "one of our problems in the management of our system is that people are in very big management roles, but they're not... they don't have a business [training]."

Other participants mentioned that managers needed to have better ethics training and more frontline clinical experience. Participants also suggested better education for the region's board with respect to resource allocation. The challenge is that making good resource allocation decisions require a wide range of skills, which decision makers may not have acquired before they got to their current position. This lack of qualifications is partly the result of how people rise to management positions within the health regions, essentially rising from the frontline departments. Given the range of skill which is needed to make good resource allocation decisions, it is important that a range of people, with various backgrounds, are involved in the allocation process.

Many participants spoke about the need for a clear process for allocating resources. One participant said the process should identify criteria which should be used to prioritize

resource requests across divisions, programs and the region as a whole. Given the number of people involved in the allocation of resources, other decision makers expressed the view that outside of the factors which should be used to allocate resources, there is a value in having a process that people are familiar and comfortable with. Participants expressed the view that transparency in budgeting is very important and that the region does do a fairly good job of keeping the budgeting process fairly transparent. All the programs in the region know what is spent by other programs. Programs also know if other programs are running a deficit.

Another reason why having an allocation process which everyone is familiar with is preferable that a priority setting exercise needs to fit with the culture and people within an organization. A priority setting exercise which works in one region may not work in another because of the people who are in the other region. Numerous participants said that the key to good priority setting is trust and respect, and a process in which everyone's opinion is accepted. The attitude of the physician leadership team is important, in terms their willingness to listen to other requests.

There has been an improvement in Region B for keeping requests for resources within an established allocation process. One participant said,

> "I think now what we've really tried to change here - and I've seen a change - is gone from, I guess, the power politics... [where the] powerful [groups] get what they want to sending priority lists and feeding that whole process of educating people up along the way and the decision-make tree."

As another participant said,

> "there was a day that a lot of decisions were made in the back hall but now, you know, we have regular [program] wide meetings and that's made a big difference... it allows everybody to have their input."

Ensuring requests for resources stay within the established allocation process still, however, remains a challenge. Participants complained that often the region will go through a priority setting exercise and once the exercise is completed, physicians whose requests have been denied will contact the DHCS directly to request resources. Circumventing the allocation process undermines the value of the entire process. It also creates a level of animosity amongst programs that work within the established allocation process. The executive of the region and officials in the DHCS have tried to address this problem by rerouting requests which programs or frontline staff make to the department back to the region. But it is difficult within the current decision making structure, where elected officials are the ultimate decision makers, to completely stop requests being fulfilled outside of the region's regular budgeting process. The aim should be to limit the number of cases which avoid being fulfilled through the process.

Given the close connection between the levels of governance in Newfoundland, a number of participants focused on how to ensure that there is an effective working relationship across organizations. Some participants said that the keys to a good relationship are that

there is a good flow of information, an efficient administration and that people understand the context in which budget requests are being made. One participant said that it is important for there to be honesty across the different levels of decision makers, with limited budget overruns and little manipulation of data. Another participant said that better coordination between the regions and provincial governments across the country could also help resource allocation.

There was some discussion that Region B should refocus its operations more on the needs of the patient. A number of factors were pointed to as distracting from a patient focus. One issue concerned maximizing the use of scarce technology to the detriment of the patient, e.g., around the importance placed on a MRI machine. Concerns were also raised that employee issues often override what is best for the patient. As another participant said, "the right of the patient care needs to supersede the right of the worker." Another participant said that the region needs to address the restrictions union contracts place on the hours employees can work, which can be detrimental to care patients receive.

There were a number of recommendations participants had about the use of evidence in the allocation process. Some participants stressed the need to impartially evaluate the research evidence to help inform funding decisions. This participant stressed that evidence reviews should report any research findings, but also any gaps in available research. Another participant said that looking at the research evidence is useful because it allows decision makers not familiar with a particular intervention to see that it is actually a standard of care, rather than just a "pet project" of a particular physician. A

third participant argued that using evidence to challenge and slow down the introduction of new technology may be beneficial for the region, given its relative lack of new resources. Participants also reported that there is a need to get beyond the emotions involved in allocating resources around certain areas of care, e.g., cancer care, child health. The focus on the evidence is one way to help overcome this emotion. There was a concern about how best to vet research evidence. It was suggested that this be done by letting local experts review the literature and see if it is applicable locally. Participants also felt that there could be a greater use of national health technology assessments. There was also a call for better monitoring of the effectiveness of new procedures once they have been adopted by the region. Finally, participant felt that evidence should look at the total system impact funding a new intervention has on the region, not just whether the intervention is effective.

Another recommendation was to increase the level of decision support. In particular, decision makers suggested increased research in areas where there are opportunities to increase efficiencies. The discussion of decision supports also touched on encouraging reallocation of resources within the programs and the use of efficiency measures.

Two participants identified a need to increase the focus on the ethics of resource allocation. Participants thought there has been insufficient discussion at the societal level about the level of coverage there should be for medical care. One participant suggested there needs to be a discussion about the level that should be spent on any one person, either during one intervention or over the life of the patient. The participant expressed the

view that this public engagement should perhaps occur at the national, rather than provincial or regional level. Another participant said that measures need to be taken to ensure that these public discussions do not turn into "advocacy conversations," in which the public engagement is taken over by groups who are only interested in getting their particular concern funded. It was also suggested that user fees may be an option for those with the financial means to pay, so as to limit unnecessary usage of the system.

Another best practice identified is to be constantly looking at what is coming on the horizon. This recommendation focused on a number of stakeholders. One participant suggested CADTH need to be focused more on emerging technologies in order to keep their assessments current. It is important for the health regions to be forward looking so that they are able to position themselves to address future demands. The use of three year budget planning is one way to help force decision makers to recognize future expenditures.

There were a number of other best practices identified. Because of the lack of resources, participants suggested that they need to be "persistent" in making resource allocation requests. Knowing people across the decision making structure was considered important, especially having people supporting requests who are not seen as having vested interest in the allocation. Having people adopt the proper perspective was seen as crucial. Another participant said that the challenge is getting people to look at budget allocations from the system's perspective. Similarly, participants mentioned the need to get those engaged in the allocation process to "get rid of 'me first' [attitude]." Another

participant said that improving resource allocation required getting everyone to focus on "what's the best thing for the provision of service across the entire program." It is also important for everyone to get educated about the needs of the program and the processes for setting priorities. Benchmarking across regions and national was seen as an important source of information. Finally, communicating with colleagues in other regions about resource requests and the factors which need to be considered, especially when developing new programs, was seen as very beneficial.

Table 5.11 summarizes all of the recommendations made by key informants in Newfoundland.

Table 5.11: Best Practices Identified in Newfoundland

• Better education for decision makers • Use of teams of decision makers • Clear budgeting process • Familiarity with budgeting process • Transparency in budgeting • Maintaining a good working relationship between provincial government and region • Focus on patient care • Improve the evaluation of evidence • Increase decision supports • Engage public about coverage limits • More focus on emerging issues • Adopt proper perspective • Persistence in making requests • Communicating with others. • Make process inclusive • Aim for consensus • Maintain trust and respect • Keep requests within established priority setting process.

5.9.1 Decision Aids Identified in Newfoundland

Participants were fairly skeptical about the use of decision tools for improving resource allocation. Many expressed the view that priority setting is too complex to use some type of model which you work through to make allocation decisions. Participants also felt that institutional culture plays a large role in successful resource allocation, so that having an established resource allocation process is more important than adopting the right model. One participant who had examined decision support tools, including accountability for reasonableness and PBMA, found that they were not applicable to the institutional problems faced by Region B. The corporate ethics committee does use case studies to help clarify and "work through options and appropriate values and so on." The pilot project described above in section 5.4.6 aims to increase considerations of the ethical aspects of resource allocation, by asking departments to consider the ethical implications of their requests as part of the region's budgeting process.

5.9.2 Challenges Identified in Newfoundland

Participants in Newfoundland identified a number of challenges to improving the allocation of health care resources. One issue which was often raised is the need to provide more funding for prevention. As in Alberta, the problem of the double investment required for preventive care was mentioned. Even within a health region that is responsible for everything from acute care to social services, the transfer of more funds into preventative and community is difficult. As a participant said,

> "Even if we transferred the money and saved the money, we still can't cross that barrier that says we will give you the money to do that in the community because it's cheaper to do it the community, because what happens then is that bed that is now vacant will just belong to somebody else."

There is the recognition that the only way to do increase funding for prevention or other community support programs is to take funding from the institutional acute care side. As another participant said,

> "There's no way that a community will be developed without it [better prevention] coming out of institutions. So we know... I mean, the writing has to be on the wall that there is only one way to build a community service up, and that is to take it out of our current system."

Yet given the level of unmet needs already within the acute care area, there is a feeling that there are little resources which can be spared from acute care.

Participants felt that while there is a lot of data, the data is often not presented in ways which easily supports decision making. As one participant described it, "we are data rich, but information poor." The participant suggested, while the region has made some improvements in this area, there needs to be a greater investment in information technology. Part of the challenge is that given the level of unmet need in the system, it is hard to get additional resources for informational technology and management support.

The relative lack of resources in the province was pointed to by a number of participants as another impediment to the improved use of resources. As one participant said, "we

were too poor to be efficient because you needed to step up. You know, you had to put an investment in to get to the next level, and we couldn't afford to get there."

Some of the participants from the program level felt they need to more effectively make requests for additional resources. Participants felt that there is a real challenge communicating the nature of their requests and the level of need associated with some requests once requests are sent forward to the executive level. Part of the challenge is to communicate program level requests to decision makers who do not have expertise in the area under consideration.

There are a number of challenges about the adoption of new technology. In other areas of the economy, the adoption of new technology leads to the replacement of older technology which helps recoup the investment in the new technology. In health care, as one participant said, "quite often what happens you bring in new technology and it doesn't become a substitute for an obsolete technology, but it becomes an additional technology." A good example of where technological innovation did not lead to offsetting retiring of older technology is in diagnostics. The development of CAT scans did not make x-ray technology obsolete. The development of MRI did not make either CAT or X-ray obsolete, but simply added another diagnostic modality.

The physicians do seem to have a number of opportunities in Region B to bring resource issues to the attention of the executive and the board of trustees. For example, there are internal discussions within their programs and there are opportunities to discuss issues

with the vice-president of Medical Affairs. Clinical chiefs can bring issues to the Medical Affairs Committee. Still some physicians expressed the view that they do not feel they have much of a voice when it comes to how resources are allocated in the region. While the regional authority tries to allow physicians to be involved in the resource allocation process, their power has clearly declined from when the health care system was organized on a hospital basis. Physicians who were not a part of the leadership team for their program feel particularly alienated from the process, which seemed to negatively impact on physician morale.

The leadership team of one department complained that if they save money in their operating budget, they should be able to use those savings for any purpose they wish. Under the current budgeting rules, those savings have to be used in their operations, e.g., they cannot purchase equipment.

In order to realize savings across a region, it is sometimes required to reinvest funds across programs. An issue about this type of reinvestment is with programs using resources which have been reinvested in other areas. For example, as a participant said,

> "the dilemma is so I free the bed; the physician thinks I can fill the bed again, not appreciating the fact that the money that was... half of the money that was associated with that bed had to still care for that client and that client is cared for in another environment."

Another participant said that in order to realize the savings which could come from reinvestment, savings need to be sufficient so as to actually close down a block of service.

There is an issue about how resources are allocated between rural and urban areas, where some participants felt that there are clear disparities in how the two areas are treated by government funding. In terms of resource allocation, there is always a divided between the main urban area in St. John's and the rest of the province. Technologies are usually first adopted in the health region in St. John's. Often then there is pressure from other areas to expand the number of sites in the province which can offer a service. The distribution of seats in the provincial legislature gives a good deal of power to the rural areas.

Participants recognized that the health region is ultimately responsible to the public. Public participation can be problematic, however, especially regarding when and how the public should be involved. While Region B did feel that they have had good consultations with the public they serve, one problem mentioned was that often public participants have a singular aim they are trying to achieve and are not open to any other suggestions. The participant suggested that this problem can be partly addressed by sharing sufficient information so that participants see the full picture faced by the region, but it still remains a problem.

Another problem for the region's administration is that health care workers are government employees. Their pay level and working conditions are determined through negotiation with Treasury Board, not the health board. Yet these decisions have large implications for the resources available to the region.

The question of allocating resources around orphan drugs was mentioned by a couple of participants. One of the issues raised was that

> "these drugs that are so selective for such rare diseases that the number of people in the world who actually would benefit from the drug is so small that you really don't have enough critical mass there to do proper research on; and so that becomes a challenge, as to how you can do that."

Another difficulty the lack of research opportunities for orphan drugs raise is that often they are only effective for a small portion of patients who have a condition, but because of the limited opportunities for research, it is difficult to determine the characteristics of patients for whom the treatment is effective. The inability to determine who treatments are most effective for can greatly undercut the cost-effectiveness of using these treatments.

Another challenge identified related to the tendency of different provinces, using the same scientific information, to reach different decisions regarding the implementation of a treatment. The fact that certain provinces decide to cover a treatment puts pressure on the other provinces to follow suit.

Some frontline staff felt that there is an increase in the amount of health care administration, but not in the amount of resources going to frontline staff. As one participant said, "if you look at health care in this country, administration has grown exponentially. Physician resources and nursing resources, the patient care resources have

stayed flat, which is interesting." Newfoundland's recent regional reorganization was pointed to as an example that the province could get by with less administration. On the other side, some administrators complained that

> "Physicians just believe that there's an endless pot... and the reality is that, as good as they are in some ways of working with us around utilization and trying to get the best practice and actually improving costs, there is very little buy-in in that community with respect to resource allocation. And the only reason why we were probably as far as we are is not because of physician leadership. It's because of program leadership groups and the managers that we've got working, who know that they have a budget to manage and, not that they're on the chopping block for that, but they know that there were no other resources, and so in the last couple of years we've gotten them to appreciate the need for reallocations within their own portfolios."

While understanding that health regions do not always have money for new programs, frontline staff and program leadership teams expressed some frustration about the lack of resources for "bread and butter" requests. There was also frustration expressed that requests for basic program requirements are considered along with requests for the expansion of new programs. To paraphrase a complaint from one participant, because a program got new beds should not affect whether their program area is expanded.

Some of the other challenges identified in Newfoundland include: It is difficult to keep the process systematic, as opposed to getting taken over by political forces. Programs which garner a good deal of media and public attention are still likely to get more resources. Likewise, programs which have dynamic, persuasive and persistent managers often get more resources. Certain participants said that because of lack of resources, physicians sometimes manipulate wait times to ensure that their requests receive a high

priority. Some participants identified a tendency not to make tough decisions at the program level, but to "push the problem higher" and let the executive make decisions which limit care, even though the executive are more removed from the program area. Changes in programs or service delivery can have large impacts on other departments, but often the other affected departments are not consulted or advised of the change ahead of time. In gathering information, decision makers felt they need to better ensure that they have all the information, not just one side. Participants expressed the view that the region does not plan well enough for the future, especially regarding the replacement of equipment. While there is a sense that decision tools focused on resource allocation will be applicable, there is a sense that there needs to be more education on resource allocation. As one participant said, "we don't know enough about it [resource allocation]."

Table 5.12 summarizes challenges identified by key informants in Newfoundland.

Table 5.12: Challenges Identified in Newfoundland

• Increasing prevention funding • Need for better information support • The need of resources to improve efficiency • The need for programs to improve their resources request • Difficulties in replacing old technologies • Physicians feeling alienated from allocation process • Programs not able to use savings for any purpose • Programs using resources which have been reinvested in other areas • Political tensions about urban / rural divide • Public participation dominated by single issues • Decisions with large resource implications outside of the region's control. • Orphan drugs • Allocation decisions in other provinces • Too much administration / physicians not supportive • Bread and butter requests not fulfilled • Allocation decision too political • Persuasive managers • Manipulating of wait times / wait lists • Pushing up tough decisions • Impacted departments not always informed of changes • Ensure all sides of an issue are considered • Better planning for the future • More education on resource allocation

Chapter 6: Saskatchewan

This chapter examines the three cases in Saskatchewan. It follows the structure of the previous two chapters. The chapter begins by examining the decision making structure of Region C. The next sections examine decision making in the three areas of care. As in the previous chapters, there are subsections focusing on the six embedded elements of resource allocation decisions, need, use of evidence, cost, ethical considerations and accountability for Region C and each of the three areas of care. The final section discusses the recommendations, decision tools and challenges identified during the interviews in Saskatchewan.

6.1 Regional Structure

In 2002, Saskatchewan restructured its regional boards, moving from 32 health districts to 12 regional health authorities. The regional authorities are responsible for providing acute care; emergency services; long-term care; palliative care; support programs for patients with disabilities; home care; community health, mental health and rehabilitation services. Cancer care is provided by the Saskatchewan Cancer Agency.

The regional authorities are funded primarily through a combination of global budgets and targeted funding from Saskatchewan Health. In June or July, Saskatchewan Health receives an indication from the Department of Finance about the likely size of their budget for the coming year. Based on this financial guidance, Saskatchewan Health's Regional Accountability branch informs the health regions of the likely changes in the size of their budgets for the coming year. Through this annual provincial budgeting

process, the health regions have the ability to identify new services they would like to offer. If large capital purchases are required, they are identified through the province's capital budgeting process. Officials from Saskatchewan Health visit the regions to discuss the budget requests from the individual regions. The Department then synthesizes the regional requests and makes their budget submission to the Department of Finance and Treasury Board. The Department's submission would identify where the service pressures are and make the case for why more resources are required in different areas.

The allocation to the region includes both a global budget and some targeted funds. Equipment purchases are often targeted. The amount of targeted funding within the budget varies over time. Even in their global budgets, a lot of the resources would already be accounted for because of the expectation to maintain current levels of services. Some participants said that the level of targeted funding has increased recently and that the provincial government retains a good deal of control over the operational areas in which funds are spent, even though it has supposed to have transferred that authority to the health regions. Although the province would have a good idea of what specific purchases the region would make, the province provides the region with a lump sum for capital costs. Certain large purchases, e.g., a MRI, would be decided on directly on by the province.

One of the influences on resource allocation in Saskatchewan is status quo budgeting, i.e. funding regions to maintain existing service levels. Because the provincial government is more closely monitoring certain indicators and has more service targets, there is more

targeted funding. As one participant said concerning targeted funding,

> "sometimes we know government may have an agenda, right – federal government [or] provincial government - that says, here's some money. You know, here's what it's for. It wouldn't necessarily be where we intend to spend the money, no; but when you got so much on that. It's not that it doesn't represent a need. It just might not be as high on our list as someone else's; but that's fine, we'll take it. You know, we'll put it to good use, right, and we'll be accountable for it."

Because of the need to negotiate service levels, an activity which can carry on for some time in the budget year, the regions may not know on budget day the total amount of funding that will be provided in the coming year. This uncertainty can create difficulties regarding the region's ability to forecast.

The province allocates across pools of areas. The regions are allowed to make small adjustments to how resources are allocated across pools. There is an attempt to use a needs-based funding model to help in the allocation of resources. The province has also used needs-based models to examine how closely the region's allocation of resources meets the needs of the community. This model incorporates seven or eight factors, e.g., current utilization, cross-regional flows of services, mortality rates. The model still needs to be developed further, e.g., developing accurate costing for all services. Part of the reason why the province needs to develop this costing information is that the Department of Health stopped recording specific costing information when it moved to global regional funding. This tool may be used in the future to help allocate resources.

Information about the regional structure is summarized in *Table 6.1*.

Table 6.1: Regional Structure (Saskatchewan)

Number of health regions in the province	12 regional authorities + 1 province-wide board for cancer care
Current health regions established	2002
Scope of regions	Acute care; emergency services; long-term care; palliative care; support programs for patients with disabilities; home care; community health, mental health and rehabilitation services
Method of funding	Combination of global budgeting and targeted funding.

6.2 Region C

Region C is one of Saskatchewan's larger health regions. It directly serves a population of approximately 250,000 people and provides specially services to other health regions. The region is responsible for providing a full range of services, including acute care, long-term care, home care, health promotion, prevention activities, and rehabilitation. In 2005-06, Region C had revenues of over $600 million or approximately $2200 per capita. From 2004-05 to 2005-06, Region C had just over a 10% increase in its operating budget.

Most participants from Region C, while recognizing that the region is not perfect, were very proud of their organization. For example, one participant said, "I think it's a real good competent organization compared to others that I've worked in or been a part of or

done some work for. I think they've got valuable staff." This sentiment was common among the people interviewed from the region.

6.2.1 Governance Structure

Region C is organized in terms of regional programs, but some sites retained some governance and reporting structures. For example, some of the hospitals retained their own boards of trustees. In some cases, programs may report to both the regional board and the hospital board. In other cases, facilities are still owned by outside groups. There are, however, affiliation agreements in place which ensure that the region has operational control so that operationally there is no difference between the facilities owned by other entities and those owned by the province. Participants did not see the retention of some site-based governance as undermining the regional nature of the programs. The regional manager for the program areas would manage budgets and human resources across all the sites which offer services under their area across the entire region.

Region C is governed by a twelve-member community board of trustees. Members are appointed by the provincial Minister of Health. The board works with the senior executive team to set both the short and long term strategic direction for the organization. It also hires the CEO and approves the region's budget request to government.

The senior leadership team, which includes the region's CEO and senior vice presidents, has responsibility for the overall daily operations of the region. Based on the strategic plan approved by the board, the executive team develops a more detailed operational plan

for the organization, with shorter timeframes and more specific operational objectives. Developing an operational plan based on a strategic plan approved by the board was seen to be driven in part by management concerns about accountability and transparency in their operations. There is a move within Region C to further involve the board in operational planning to help ensure greater accountability.

There are vice presidents for particular service areas and specific corporate functions. There is also a vice president of medical affairs, who acts as the chief physician for the region. Under the vice presidents are regional directors for specific programs. At the department level, there are general managers and, usually, a physician lead. They are responsible for the administrative and medical side respectively, but they're expected to work together in making decisions for the program area. *Figure 6.1* outlines Region C's governance structure.

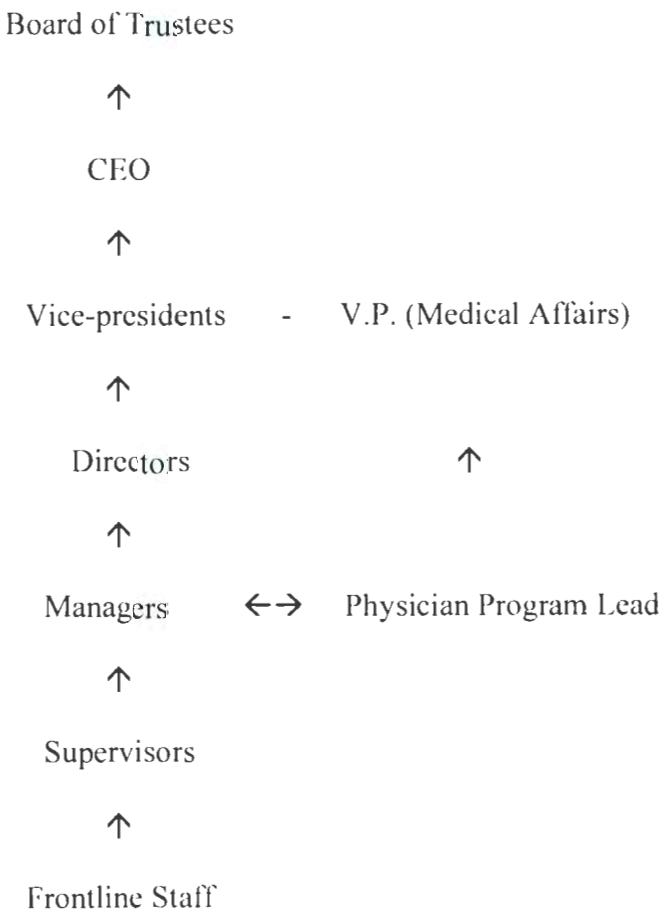


Figure 6.1: Region's C Decision Structure

Some participants felt that there are too many layers of decision making authority within the organization and that decision making is not close enough to the point of care delivery. The multilevel of decision makers also hampers accountability because it blurs who has responsibility for making certain decisions.

Table 6.2 summarizes some of the information presented in the previous two sections about Region C's financial status and management structure.

Table 6.2: Region C Financial Data and Management Structure

Total Revenue	$600 Million
Revenue per capita	$2200
Increase in operate costs (2006-2007)	10%
Management Structure	Regional programs, although retains some of the old site-based governance structures

6.3 Resource Allocation at Region C

Region C makes its annual request for increased resources to Saskatchewan Health as part of the regular provincial budgeting process. Saskatchewan Health works closely with all the regions throughout the year, so that there are generally no surprises in the priority request put forward. Regions are expected to provide, at a minimum, the level of service that they performed the year before. Almost three-quarters of a region's annual funding is targeted to labour costs. These labour costs are determined by provincial government negotiation with the unions representing the different bargaining units of health care workers. That a very large proportion of the region's budget spending is outside of its control greatly limits the freedom the region has to set its own spending priorities. Another issue affecting the region's budget is that there have not been large increases in

funding over the last few years. As one participant said, "it's different if you're in growth mode and you've had a lot new money and kind of decide how to spend it. It's not the situation here."

One participant described the priority setting at the executive level as identifying program requests informally as either an "A," "B," or "C" category priority.

> "The "A" list is things that are basically already happening. It's kind of down the pipe. We're spending the money so we'd better incorporate it into this year's budget. The "B" list is sort of - these are high priority things that are going to mean money so we know if we have resources, we'd like to do these. We'll get to those. Then there's the "C" list, which is clearly wish items. You hate to put things on that list because you know they're just going to get tossed aside."

The participant went on to say that the "A" list requests are usual crisis management kind of requests, e.g., where equipment has broken down. The participant pointed out that sometimes it is unclear whether the "A" list requests are truly urgent or are on the list "because the crisis was created."

The senior leadership team considers a number of factors in approving new programs. Usually requests come from staff, who see a new program as a way of better serving a particular patient population. As one participant said, the senior leadership team then considers whether the program "intuitively makes sense." Is the program in line with the region's priorities? Is it affordable? Are there staff concerns? This test of intuitive sense is only the first screen. Just because the addition of a new program makes intuitive sense

to the region's executive does not mean that there necessarily will be funding for the program.

Factors Determining Budget Allocations

In setting spending priorities, the senior leadership team considers a wide range of issues, including the impact on the work environment, the implications from a collective bargaining perspective, public perception, provincial government policy, ethical and legal issues, along with patient safety and patient care concerns. The strategic plan is also seen as something which directly guides resource allocations. The general managers of the different programs will also meet to develop a priority listing. This list is often driven by what necessarily needs to be replaced and is forwarded to the executive team for consideration in the budgeting process. A list of all of the factors identified is presented in *Table 6.3*.

Table 6.3: Factors Identified as Determining Budget Priorities

• Clinical need / Best interest of the patient • Current standard of practice • Patient safety • Necessary equipment replacement • Expected clinical need / Clinical trends • Cost / Institutional impact / Impact on the work environment • Requests from general managers • Collective bargaining implications • Public perception • Provincial government policy • Ethical and legal issues • Strategic plan

Capital Budgeting Process:

Capital budgeting is separate from operating funding. Any purchase over $5000 is considered as part of the capital budgeting process. There is a director of capital financing within *Saskatchewan Health* which the region would discuss their capital requests. *Saskatchewan Health* gives the regions two funding envelopes for capital funding. One envelop is for the clinical capital fund and the other is for infrastructure. Participants from the region reported that these funds have, in the recent past, been well below the level of need in the system. Region C did report that they are in a much better position regarding the level of knowledge they have around their capital needs, the measurement of these needs, and the risks associated with having these shortcomings. This increased level of knowledge has helped the region made a stronger case for increased resources. Still capital expenditures were generally not seen as a top priority by the decision makers. The accord money was influential and had its own allocation process, focused on identifying priorities which matched the federal priorities.

Region C separates the decision making process around capital equipment purchases between replacement of equipment and new equipment. For the replacement of equipment, Region C has developed an inventory of assets and a process for assessing the state of all the equipment the hospital has. The criteria used to assess equipment includes its use, age, level of risk to patients and staff, volume of usage, is the equipment a newer technology or older technology, and whether it requires a high level of maintenance. These criteria are then weighed to classify equipment as either in good, fair or poor

condition. The goal for the senior leadership team is for the programs to maintain 40% of their equipment in good condition and to use this 40% mark as a guiding principle in making capital purchases. On their initial assessment, Region C found that 45% of their capital equipment was in good condition. Allocations for replacement are generally very small. For a capital asset pool of over $140 million dollars, approximately five million a year is allocated for equipment replacement. As one participant said, "we can have a piece of diagnostic equipment that takes the whole year's allocation to replace." Because of the expense that comes from capital purchases which can overtake the entire resources available, Region C has begun presenting to government two priority lists: one for large capital purchases, the other for smaller capital purchases.

Because often the replacement of equipment entails purchasing equipment with expanded capabilities, in some cases, the senior management team has to decide whether a capital equipment request should be treated as a replacement of existing equipment or the acquisition of a new technology. For example, for a new biplane angiography, the region submitted a request for additional resources to the province as an equipment replacement. For new purchases, Region C is planning to establish a technology assessment committee, which will have support to evaluate some of the evidence and make recommendations around new technologies. While the province is aware of what the capital purchases are likely to be for the coming year, the funding for the capital purchases are given to the region in a hump sum so that provincial officials do not have to be involved in each capital equipment purchase.

Region C used to have a medical equipment committee that reported to the MAC. Physicians would score requests for new resources and prioritize in that way. In practice, management felt that it really was a case where every department essentially got their top priority filled regardless of the scores given to requests across programs. The current process tries to be based more on need, urgency and regional priorities. The process also tries to be more data driven and priority setting has a much greater role for administrative and operational leads.

Region C has a health foundation which funds some equipment purchases. Although it has not always been the case, the relation between the region and its foundation is more attuned now, with the foundation's funding initiatives more closely aligned with the region's funding priorities. The executive is mindful to propose projects which make for good funding opportunities.

Procurement

The procurement process is managed by the clinical program for which the equipment is intended. For large purchases, the procurement process starts with the development of a RFP. The RFP would be developed by the clinical program and distributed publicly. Most vendors would know ahead of time that the region is considering purchasing a particular piece of equipment. Bids are received. Depending on the equipment being purchased, vendors may be asked to make a presentation. An evaluation committee is selected and evaluates the bids. Again, depending on the type and value of the equipment

purchase, there may be site visits. The region is moving more to bundle tenders across sites or for all of the equipment needed by a program for a number of years.

6.4 Resource Allocation Issues at Region C

The executive of Region C are responsible the resource allocations made within their region. The executive would allocate resources across the different program areas. It would involve in making program level decisions which have a substantial impact on the region's operations or have substantial costs associated with them. The executive may also decide on any issue which is particularly contentious and in this way could be involved in decisions concerning the care individual patients receive. Participants did, however, give the impression that Saskatchewan Health can, at times, become very involved in making a wide range of the resource allocation decisions. In certain areas of care, e.g., diagnostics, the province would make specific decisions concerning levels of activity and purchase of new equipment.

As with Region A and Region B, the executive's decision making can be described as closed-door / top-down, in that it is only the executive who makes the decision and its decisions are then imposed on the other levels of the region. The executive does aim to bring in as many perspectives as possible into the budgeting process.

6.4.1 Region C and Need

Region C has used community needs assessments to assist in program planning and resource allocation. The use of needs assessments is an approach the executive plan to

use more in the future. Internal utilization data and reports from frontline staff are also important sources for determining the level of need for a service.

6.4.2 Region C and Evidence

Region C has recently conducted a survey looking at the degree to which research and evidence get used in decision making. The overall conclusion is that evidence is sometimes used to support decision making, but barriers remain, e.g., the lack of relevant evidence. Regarding the use of evidence in resource allocation decisions, one participant said,

> "it varies department to department... in some cases this year, there was a difference in the understanding of evidence and where to get it. In other cases, the evidence just didn't exist. ...When you ask though in the final analysis when the decisions get made at the regional level, how much evidence? Well, I have to say, with some of the bigger costs, high impact decisions, a fair bit of evidence is being looked at in making the recommendation."

The participant went on to say that this does not always mean that evidence is the most important factor in making many resource allocation decisions. Sometimes other factors trump evidence.

The region has a planning group which provides statistics and other decision support to the different program areas. The region also reports having a good deal of recent data, in terms of local needs assessments, satisfaction surveys, which are used in planning. Participants said that they need to tap into more rigorous, objective technology assessment before expanding into new services.

6.4.3 Region C and Cost

Costs are determined mostly by using internal data, although sometimes vendors will be contacted regarding the cost of capital equipment. Budget increases are often tied to a program doing a specified number of new procedures. None of the programs looked at in this project reported considering the cost-effectiveness of interventions.

6.4.4 Region C and Accountability

The provincial government has written agreements with all of the regions that set out the required levels of service. There are also specific indicators the province uses to assess the regions' performance. As a part of the provincial budgeting process, the regions submit operational plans to the department. In some case, individual programs would directly report their performance to Saskatchewan Health. One participant said that,

> "I think, in fairness, the government here has done some really good work. I think they have been... if not as the head of the pack - we're the head of the pack in terms of very detailed accountability throughout the health region."

But the participant went on to point out that there are often compromises which have to be made in terms of meeting targets, e.g., patient safety vs. volume.

Region C has a network of community advisory panels, which represent different geographical communities within the region. The use of these panels is mandated by the provincial government. The panels give advice on broad planning directions. There was a feeling from some participants that these networks could be better used in the planning

of services. In the past, other types of public forums were used to engage the public. For example, a researcher was hired to work with a committee of public representative. Through community focus groups and analysis of data about the region, the group gave the region recommendations on priorities and investments. Although there was some concern within the region's management about the process, it was generally seen as a success. There was no clear connection, however, between that approach and priority setting within the region.

The region has taken a number of other steps to help ensure accountability to the public. Developing an operational plan based on a strategic plan approved by the board of trustee was seen to be driven in part by management concerns about accountability and transparency in their operations. The board of trustees meets regularly with public. In terms of transparency, one participant said that "I think there's been tentative steps in that direction and a consistent desire to find a way to do that better - to involve more people and players... [but at the most] of the transparency is in sort of the lower manager and upper management level." The same participant also said that there was a good level of transparency and communication between the region and the provincial government. The region has worked with an expert in resource allocation to develop a resource allocation process which could be seen as more accountable. While some work was done, the project is currently on hold as other management initiatives are being pursued.

6.4.5 Region C and Ethics

There was little direct discussion of the ethical aspects of resource allocation at Region C within the participant interviews. Region C has, however, run a pilot project to see if Accountability for Reasonableness could be operationalized within the region to improve overall resource allocation. While preliminary work has been done, the pilot project has not been used to directly support the allocation of resources. Part of the difficulty has been with trying to determine the most appropriate level at which to use the Accountability for Reasonableness framework, e.g., at the executive level or at the program level.

6.4.6 Initiatives Improving Resource Allocation at Region C

In the last couple of years, Region C has done a good deal of work in the area of resource allocation. They have brought in experts in the area to examine the region's allocation processes and make recommendations. They have tried developing a more formalized process for allocating resources. One of the difficulties the region encountered when trying to use a more explicit approach was determining the best level for using a more methodologically fixed allocation process. The region had attempted to employ a variant of accountability to reasonableness at the regional level, but the full process was never completed and the project has now been put on hold while the executives deal with other reforms. One participant suggested that the accountability to reasonableness approach, modified to include opportunity cost considerations, would best be employed at the specific program level. Region C has not tried to employ the accountability to reasonableness beyond the regional level.

Reviews of Region C's experience with Accountability for Reasonableness have been mixed. Some participants said that they thought the exercise "was a really good process to force us through clarity around what were the key elements in terms of setting priorities." There was, however, also a level of discomfort with the priority setting exercise, especially for groups whose programs were on the bottom of list of priorities. There were concerns that if a priority setting exercise did identify a program area as a low priority, but it was a high priority for the province, so that the region was forced to fund the program. It was felt that this would cause some tension with the people who participated in the priority setting exercise. The view was also expressed that some of the clinical and scientific people found difficulties with the vagueness around the priority setting exercise. One participant said that they felt that the exercise "just added another level of complexity." Another participant said,

> "I think there's this assumption that all you have to do is set in place a process for decision making for resource allocation issues, and then you just follow the process through, whether it be some kind of logic model or critical decision making, and then you just pour things through the process and that's it, whereas the reality is there may be demands coming forward from professional bodies and the public that weigh into that, despite your decision. Maybe it's attached to a recruitment issue for a special physician. Maybe it's a high-profile community member that needs this and a letter gets sent to the Minister of Health, and then for a variety of other reasons, there may be a trumping of a regional decision."

In other words, the promise of the Accountability for Reasonableness approach never lived up to the reality.

6.4.7 Overview of Resource Allocation at the Executive Level of Region C

Table 6.4 summarizes some of the information presented in sections 5.4 to section 5.4.6.

Table 6.4: Overview of Resource Allocation at the Executive Level of Region C

Resource Allocation Decisions	Across program areas; within programs and occasionally, in clinical circumstances. Inclusive, but ultimately closed-door, top-down. Saskatchewan Health is sometimes involved in specific decisions. Saskatchewan Health is closely involved in the management of the diagnostics program.
Need	Determined by staff, internal data and the use of needs assessments.
Evidence	Varies depending on issue under consideration. New and innovative technologies usually require a good deal of information. Internal data and expert opinion are important types of evidence.
Cost	Primarily concerned with budget impact, determined primarily by internal data, although sometimes vendors are contacted. Cost-effectiveness not considered in the areas of care being studied.
Accountability	General government structure; annual reports; public reporting; good internal transparency; advisory network.
Ethics	Little direct discussion of ethical considerations. An attempt to use Accountability for Reasonableness to improve the process of allocation resources.
Innovations for Improving Resource Allocation	• Resource Allocation Pilot Project (Accountability for Reasonableness)

6.5 Resource Allocation within the Diagnostic Imaging Program

As in the other two regions, in Region C, both endovascular coiling and MRI are budgeted through the Diagnostic Imaging program. It is useful to begin our discussion of

resource allocation in these two areas by examining how resources are allocated across this program.

Decision Structure

In Region C, Diagnostic Imaging has responsibility for MRI, CT, nuclear medicine, general radiology, ultrasound, lithotripsy, interventional and vascular imaging. The program is run by a clinical chief and program manager. Both report to the executive through the Vice-President of Medical Affairs. There are supervisors for each of the modalities across the region.

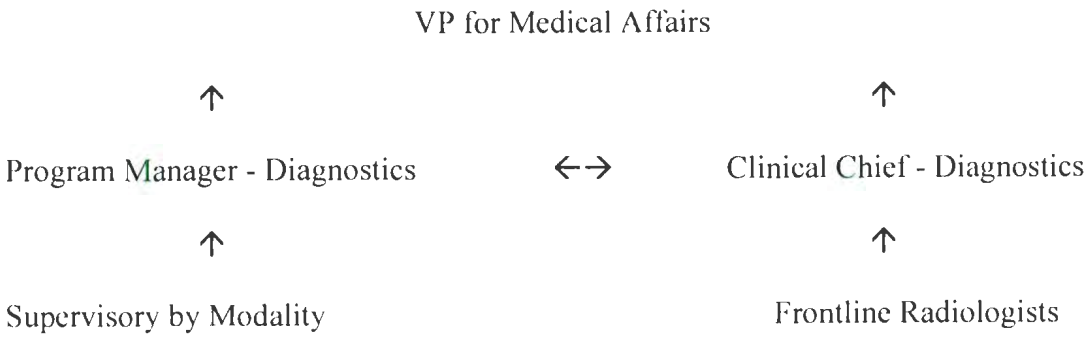


Figure 6.2: Decision Making Structure of the Diagnostics Program

Budgeting

One participant said that the annual budget for Diagnostic Imaging is built up "by site and by modality." The program looks at the number of tests it runs by modality at each site. It then determines what changes in activity it plans for the coming year. The budget

request would also take into account any changes in cost drivers for the program. The program keeps detailed budget records by site and by modality, which can be further broken down by worked hours, salaries, benefits, medical remuneration to our staff. The program is thus able to fairly accurately match increases in funds to the likely increase in activity. Although any budget requests are usually tied to performing a specific level of service by modality, there is some flexibility around shifting budget allocations across modalities if adjustments are needed throughout the year or if there are changes in circumstances. Remuneration for physicians to read scans is part of the region's global budget. Capital costs are treated separately in coordination with Saskatchewan's Diagnostic Imaging Network.

Diagnostic Imaging Network

In 2004, prompted by years of under funding and the rapid changing nature of diagnostic technology, Saskatchewan Health (2004) conducted a province-wide review of its diagnostic imagining capabilities to determine what strategy the province should take going forward regarding diagnostic imaging. The review recommended the establishment of a provincial Diagnostic Imaging Network to advise the government concerning diagnostics imagining. Soon after, the Minister of Health (Saskatchewan Health, 2005) accepted the review committee's recommendation and established a Diagnostic Imaging Network, as an attempt to make the provision of diagnostic services more transparent and consistent across the province.

Although it was originally meant to be advisory in nature, the effect of the Diagnostic Imaging Network is that, to a large extent, the management of diagnostic imaging can be seen as being taken out of the regions. As one participant said, in diagnostic imaging, "the priorities are set for us" by the provincial council. Through the Diagnostic Imaging Network, Saskatchewan Health receives monthly reports on activity levels and wait lists for every diagnostic imaging department in the province. These reports inform the province of any tests targets which are being missed. As one participant from the region said,

> "We work with the government every year to plan targets for next year, so they continually track and monitor monthly through us what our wait times are and what our prioritization system is. So they have their finger on the pulse to see how much MRI service are we doing, what are the service pressures so that they can then build their budgets and their targets for us for the next year."

The provincial committee would also determine what capital purchases are made across the province. The individual diagnostic programs would receive their funding as part of the region's global budgets, but the province determines the service levels the region would have to maintain. Through these targets and the province's close monitoring of these targets, even though the funds flow through the region's global operational budget, the funding is in essence directly targeted by the provincial government for diagnostic imaging.

Participants asked about the provincial strategy felt that it was a good approach, given the size of the province and the need to have consistent diagnostic imagining standards, given that patients are often transferred for care across regions.

6.6 Endovascular Coiling at Region C

Region C does not currently offer endovascular coiling. Patients who require the procedure are presently sent to Alberta or, in a few cases, Ontario. There is however some debate about whether an endovascular coiling program is going to be established by the region. In fact, there seemed to be some level of animosity among some decision makers around this issue. Some decision makers said establishing an endovascular coiling was not an issue being considered by Region C. One participant in particular said that he was opposed to the establishment of a program due to the fact that there are no trained staff, no bi-plane angiography, no budget for coils, and likely not a sufficient volume of cases to justify a program or to maintain physicians' skill set. Other decision makers said that the program has been agreed to and was expected to be established in the coming year. Still others at the senior executive level said that no discussion has yet occurred about whether to establish a program or not.

Much of the confusion over whether Region C will start an endovascular coiling program results from the different components required for a program: trained staff, a bi-plane angiography, an inventory of coils, and dedicated operating funds. Region C is in the process of purchasing a new bi-plane angiography. Because of construction at one of the hospital sites, the existing angiography suite had to be moved. Cost comparisons showed that it made sense to replace the old angiography suite with a new suite, rather than move the old one. In buying an angiography suite, the assessment team from Diagnostic Imaging considered what future needs there may be on the equipment, including the

possibility of starting an endovascular coiling program. As one participant said, the purchase of a new bi-plane angiography,

> "is the replacement of an existing system. So while we're upgrading to a new system, we looked at what our current and future clinical needs are going to be and we've assessed that we're going to buy a bi-plane neuro system."

Region C's executive has approved the purchase a new bi-plane angiography as a replacement of the old single-plane angiography suite.

That the purchase of a new bi-plane angiography was presented to the executive as a replacement of current equipment, rather than as a way to deliver a new service, likely influenced their decision to purchase the expanded bi-plane capabilities. A number of participants felt that after years without sufficient funds being put into capital purchases,

> "in many cases we're just in replacement mode; but if when you're going to replace, you know, it is absolutely the time that you're looking at what you're going to replace it with, and how can we get the best bang for your dollar. So I think most of the decisions here are basically looking at replacement but there is an upgrade do that, just because technology is changing."

Members of the region's executive also recognize that departments often are expanding the capabilities of their equipment when old equipment is being replaced. As one member of the executive said about the bi-plane angiography,

> "It would be still presented that way to us with the explanation - say, look, we had to replace this anyway - and the request may have come forward then. Replacing this machine with a similar machine we can get would cost x and this is what we'll be able to do with it. Our option is to replace with a plus. Here's what it would cost, and we could get these efficiencies out of it, and a decision is made based on that, and that's happened quite frequently. So it appears on the "A" list because it's something we have to replace."

A decision has also been made by Region C to train a new staff member in endovascular coiling. A Saskatchewan-born radiologist was being recruited by Region C. As part of the recruitment agreement reached with the radiologist, the vice-president of Medical Affairs agreed to send the radiologist on a fellowship to learn how to perform endovascular coiling. This radiologist will be back working in the region in 2007 and at that point will be trained in the coiling procedure.

Based on the purchase of a bi-plane angiography and the training of staff it seems that the region is moving towards starting an endovascular coiling program. In fact a number of participants felt that the endovascular coiling program would be established soon due to the momentum of already having a bi-plane angiography and a trained physician. One participant said about the decision to purchase a bi-plane angiography that "the region definitely has staked the ground that this is a service we want to provide." Yet the decision to purchase a bi-plane angiography and train staff were both made without any explicit decision on the part of the executive whether or not to start this program. The purchase of a bi-plane angiography suite was made in the context of replacing a piece of updated equipment. The decision to send the new radiologist for training was part of a recruitment agreement reached with the new physician, a decision the executive was not

made aware of until after the radiologist was on his fellowship. As a member of the executive said of the movement towards an endovascular coiling program that "it wouldn't get to this point now, but it got to this point because of the last couple of years of how we operated." All of the members of the executive said that they have not yet considered the establishment of endovascular coiling program, but that they were aware of the possibility of starting the program. The executive have also not yet begun to formally assess the pros and cons of starting the program.

Fee-Code for Endovascular Coiling

The Saskatchewan government has not previously paid for endovascular coiling. There is not even a fee code for endovascular coiling within the physician fee schedule. In order for a new service to get a fee code, it likely would be first requested by the Saskatchewan Medical Association as part of regular negotiations on the province's physician fee schedule. These negotiations would include a discussion of whether the provincial government believes there is a need to cover the new service on an ongoing basis. The regional health authorities may also put forward the program as a service they would like to start offering. The regions would be involved to some extent in the discussion around any new service, because it is the region that ultimately provides support to any new service.

6.6.1 Resource Allocation Issues around Endovascular Coiling

The main resource allocation issue for Region C is whether to begin an endovascular coiling program. The decision to start this program would be made by the region's

executive. Once it is considered, this decision will be greatly influenced by the fact that Region C are in the process of training staff and purchasing a new bi-plane angiography suite. The decision to establish a program focuses then primarily on whether to purchase an inventory of coils and about dedicating operational funding. Another key issue is whether Region C have sufficient patient volumes to allow physicians to maintain their skill levels so that a sufficient level of patient care can be maintained. The initial inventory of coils would be seen as a capital cost and captured within the regular capital budgeting process. The executive have not begun to consider whether it will begin an endovascular coiling program.

6.6.2 Endovascular Coiling and Need

Because the region has not begun to look at whether it will start performing endovascular coilings, there have been as of yet no formal attempts to determine the level of need for this program. So far, the need for this program has been determined informally through staff estimates of the likely patient population and the number of patients sent from the region to other provinces for coilings.

Another issue raised regarding the need for endovascular coiling is that it is not just the number of patients requiring care which determines need. There is also a patient safety issue. Some frontline participants said that because of the risk to critically ill patients associated with sending them out of province, there is a need for a local endovascular coiling program even if the number of patients who avail themselves of the program is relatively small.

6.6.3 Endovascular Coiling and Evidence

The executive have yet to consider whether or not to establish a coiling program. When the executive does move to consider establishing this program, participants said that they will focus on operational data, rather than focusing on research evidence about the effectiveness of coiling. As one participant said, "the main evidence is about the volumes, not the effectiveness. The impact on us and the community, as opposed to effectiveness in evidence." All of the frontline staff interviewed felt that endovascular coiling was a safe, effective and well-established procedure for treating cerebral aneurysms.

6.6.4 Endovascular Coiling and Cost

Program cost has not yet been considered by the executive. The new bi-plane angiography was purchased through the regular capital budgeting process.

6.6.5 Endovascular Coiling and Accountability

Given that the program has not been established, there are no special accountability measures for endovascular coiling.

6.6.6 Endovascular Coiling and Ethics

There has been no specific discussion around the ethics of starting an endovascular coiling program.

6.6.7 Overview of Endovascular Coiling

Table 6.5 provides an overview of the six factors relating to endovascular coiling in Region C.

Table 6.5: Overview of Endovascular Coiling

Usage	Currently not available.
Resource Allocation Decisions	Whether to start an endovascular coiling program. The executive have not considered whether it will begin an endovascular coiling program.
Need	Only informally considered at program level, based on estimates of frontline staff and the number of cases sent out-of-province for the procedure. Patient safety also seen as a determinate of need.
Evidence	Not yet considered by executive. Seen as an effective treatment by frontline staff.
Cost	Program cost not yet considered by executive. Bi-plane angiography purchased through regular capital budgeting process.
Accountability	No specific measures.
Ethics	Not discussed.

6.7 MRI in Saskatchewan

Saskatchewan has four MRI scanners and a scan rate of 20 scans per 1000 (CIHI, 2006). One participant said that in terms of the G7, Canada is below the average number of MRI scans per capita, and that Region C is well below the national average. This is partly the result of the provincial situation. Large proportional debt and years of difficult fiscal situations led to insufficient provincial funding going to the purchase of capital

equipment. The financial situation in Saskatchewan has improved in recent years. There is also new funding for diagnostic equipment under the federal-provincial health accord.

In terms of the use of MRI within the province, one participant described how the use of MRI was becoming more investigative as a wider range of cases, and often time less serious cases, are scanned. For example, previously only patients with a history of lower back surgery would be scanned using an MRI. Now all patients with prolonged lower back pain are scanned. One of the results of this wider scanning range is that there is a significant increase in the number of scans which are coming back normal.

Diagnostics Imaging Network

The province has recently developed a diagnostic imaging network, which is intended to determine the level of need for new equipment and examine ways to maximize the use of existing operational capacity on a province-wide basis. The diagnostic imaging network is developing a tool to help identify the best diagnostic modality for particular patients. This tool should improve both wait time management and decision making at the point of delivery.

MRI in Region C

Region C has two MRI machines. One runs on extended hours to 11:00 PM on weekdays and half days on weekends. The other site does not have capabilities to book outpatients after hours because the facility it is located in is closed.

6.7.1 Resource Allocation for MRI

For operating costs, MRI usage and other costs associated with MRI are tracked on a monthly basis for each site and for the total for the modality. Average cost for MRI scan is also measured. Monthly usage is compared to usage for the previous year to identify any variation. Capital depreciation is calculated through the hospital's capital budgeting process. One of the reasons for this separation is that the provincial government is directly involved in decisions to purchase major new capital equipment, e.g., a new MRI, so that there is no need to include it on the operating side. As with the Diagnostic Imagining budget as a whole, the entire budget request around MRI would be built up from site, based on the previous year's activity.

Because of its sensitive political nature, MRI performance is closely measured by the provincial government, both in terms of service volumes and wait times. Trends for both measures are also closely watched. If government targets are missed, Saskatchewan Health would hold discussions with the region and the Diagnostic Imaging Network about how to address the problem. In determining Diagnostic Imaging's budget for the coming year, Saskatchewan Health would work with Region C's finance department to identify any inflationary pressures and the cost of any planned service increases. As one participant said, "government usually knows line by line what the inflationary" pressures are. Saskatchewan Health would then submit its request for diagnostic services funding for the coming year as part of its annual budget submission.

One issue around determining the level of need for diagnostic services is the impact other programs have on Diagnostic Imaging. For example, cancer care in Saskatchewan is delivered through the Saskatchewan Cancer Agency. A large proportion of the MRI usage is for cancer care. Previously, Region C would bill the Cancer Agency for that activity. Allowances for the impact of other programs on Diagnostic Imaging, including for cancer care, are now included in the region's global budget. Still Diagnostic Imaging can be adversely impacted by other areas adding new programs which require diagnostic resources. Participants said that there needs to be a better process in place to gauge the impact of new programs on Diagnostic Imaging.

All Diagnostic Imaging funding is targeted by the province through the region's global budget. The provincial government would set its targets for the level of service for different diagnostic modalities. While there is some flexibility to adjust funding across different modalities, the province would identify specific increases for each modality. As one participant described, "they send a letter with a cheque to the finance department. They add that to our global budget and they add it to our accountability targets. So, for the most part, we're globally funded, but there is line by line accountability back." The provincial budget cycle starts in either September or October. The budget is publicly released by the government in April, but usually funds do not flow until June.

Internally within Diagnostic Imaging and within the executive, there would be discussions about how many MRI machines the region needs and where these new machines should be located across the region. The executive would make its

recommendations to government on these topics. The Diagnostic Imaging Network also would be involved in any discussion around the purchase of a new MRI. The provincial government, however, would make any decisions around the purchase of an MRI. This decision would be made at the cabinet level. Region C is soon getting a new MRI. Saskatchewan Health has also indicated that Region C may get a second new MRI. The department has even indicated the likely site for this second MRI. Diagnostic Imaging starts planning for the new staff as soon as the purchase of a new scanner is announced, so that there are sufficient people in place to read the exams once the new scanners come on-line.

Guidelines

There are currently no guidelines on MRI usage in Region C, next to the requirement that they have to be ordered by an appropriate physician. There is a process for prioritizing requests for MRI, where they are reviewed by radiologists and classified into three classes: Emergency, Urgent, and Elective. Wait times for elective MRIs used to be 16 months, but the time has since improved to 6 to 7 months. Wait times for urgent MRIs are one week. Emergency MRI wait times are the same day.

Participants felt that there would likely be more formal guidelines adopted around MRI usage in the future, particularly around when MRI tests should be ordered. One participant warned,

> "The government would probably want to be careful what they wish for [around new diagnostic guidelines]. You know, they always want to ensure that we're using them... the right modalities for the right tests for the most part. If we follow the guidelines, it would probably drastically increase our use of high-end modalities and probably drive up the costs further."

This likely increase is due to the fact that most of the guidelines being developed recommend wider usage of MRI than are currently being performed.

Another problem identified around the use of guidelines is that their ability to effectively influence usage is dependent on the ordering physicians. The physicians need to respect the guidelines and recognize their importance or they will not be effective. Without physicians buying into the system, there are few constraints on a physician's ability to order diagnostic tests, regardless how the guidelines are structured. This is partly due to the limited information a radiologist has to evaluate requisitions, all of which comes from the ordering physicians. For example, one participant said "how do you tell a neurosurgeon you don't think that it is an appropriate MRI without ever seeing the patient."

Another participant recommended an alternative approach to diagnostic guidelines, which better informs physicians about the budgetary implications of ordering unnecessary tests. He said,

> "As long as you give them [the ordering physicians] the information... all of the information to understand the pressures, right; and a lot of times, physicians don't have the information in front of them that, you know, it doesn't make sense to do that test because it adds very little to the patient, the patient visit or the patient outcome or the patient. You walk them through the fact that, by doing that test, it really adds no value and we now have no money to do x, y and z and if you communicate openly with them and keep them in the budgetary system, I find then they make appropriate decisions; but if we don't give them information, they don't know where we sit financially."

Participants also said identifying high users of MRI and reviewing their ordering on a one-on-one based may be another approach more likely to allow for more appropriate MRI usage while avoiding some of the difficulties of systematic guidelines.

6.7.2 Resource Allocation Issues around MRI

The decision whether to purchase a new scanner would be made by the provincial cabinet, with input from the Diagnostic Imagining Network and Region C. The location of an MRI to a region would also be made by cabinet, but the location of an MRI within the region would be more bilateral, between the government, the Diagnostic Imagining Network and Region C. Procurement would be mostly determined by the diagnostics program and the regional executive.

Saskatchewan Health determines the annual budget for MRI and thereby determines the number of scans to perform annually. Specialist physicians make requisitions for MRI. Radiologists review these requests and determine their level of priority. The radiologists and the program manager for Diagnostic Imagining determine the scheduling of cases.

These resource allocation decisions who is responsible for making them and how the decisions are made are summarized in *Table 6.6.*

Table 6.6: MRI Resource Allocation Decisions at Region C

Resource Allocation Decisions	**Decision Maker**	**Type of Decision Making**
Determine whether to invest in new equipment.	Provincial cabinet	Inclusive, but ultimately closed-door, top-down.
Determine where to locate equipment		
A. To which region	Provincial cabinet, Diagnostic Imagining Network	Inclusive, but ultimately closed-door, top-down.
B. Within region	Regional executive and Diagnostics leadership team	Inclusive, but ultimately closed-door, top-down.
Procurement of equipment	Diagnostics leadership team and regional executive	Bilateral
Scheduling cases	Radiologists and DI program manager	Bilateral
Determine whether to order an MRI	Specialist physicians	Clinical circumstances
Prioritize MRI requisitions	Radiologists	Clinical circumstances

6.7.3 MRI and Need

Because Saskatchewan Health makes the decisions around service levels, within the region there is little formal consideration of MRI need. The region, however, recognizes the need for added MRI capacity. Diagnostic Imaging program does keep detailed

records regarding service levels, wait times, and cost which it regularly shares with Saskatchewan Health. This data is used by Saskatchewan Health to determine the level of MRI need for the province.

6.7.4 MRI and Evidence

There was little discussion of evidence regarding MRI. Participants never expressed any questions about the usefulness of the technology or about its range of application within Region C.

6.7.5 MRI and Cost

The operational cost for MRI is determined by examining internal utilization data. There were no reports of considering the cost-effectiveness of different modalities. The cost of purchasing a new MRI would be determined primarily through discussions with vendors.

6.7.6 MRI and Accountability

In providing operational funding for MRI, Saskatchewan Health uses activity-based budgeting, i.e., it links new diagnostics funding to specific numbers of increased scans. Saskatchewan Health also closely monitors wait times and service levels for MRI. MRI usage is partially determined within a province-wide diagnostic imagining strategy. MRI spending must meet all guidelines regarding government spending and reporting.

6.7.7 MRI and Ethics

There was little discussion about the ethics of MRI allocations. In general, participants felt that there were few ethical issues directed related to MRI.

6.7.8 Overview of MRI

Table 6.7 provides an overview of how the five component factors are handled by Region C's MRI program.

Table 6.7: Overview of MRI

Need	Determined by Saskatchewan Health using internal usage data provided by regions.
Evidence	No question of the effectiveness of the technology or its range of application.
Cost	Analysis of internal costing and usage data; discussions with vendors.
Accountability	Activity-based budgeting. General government accountability. There is a province-wide strategy regarding diagnostic imagining.
Ethics	Little ethical considerations.

6.8 Powered Upper Arm Prostheses in Saskatchewan

Powered upper arm prostheses make-up a fairly small proportion of all prostheses in the province. Myoelectric clients account for only about 1% to 2% of client visits. Participants felt, after reviewing their records, that the number of new myoelectric clients for the entire province would be "around one a year at most."

6.8.1 Getting a Powered Upper Arm Prosthesis

The process for getting a myoelectric arm begins with the client requesting a myoelectric or inquiring about a myoelectric to their local orthotics lab or prosthetics clinic. In some cases, providers may suggest to the patient that they would likely be a good candidate for a powered upper arm prosthesis.

Once an interest is expressed by the patient, a team would assess the patient. The team would usually include a physiatrist, a prosthetist, a physiotherapist, and may, but not usually, include a psychologist. If there is no psychologist, the physiatrist may do a partial psychological assessment as part of their wider assessment. A social worker would be involved if the patient is a Native Canadian. This is due to the fact that Native Canadians have coverage for myoelectric prostheses under federal government funding arrangements.

The case for a myoelectric prosthesis is built upon a number of considerations. The ability to demonstrate that the upgrade to a myoelectric would result in an improvement in functionality and an improvement in the person's quality of life is important. The psychological impact of using a myoelectric arm, e.g., on self-esteem, is considered. A number of clinical issues are assessed, including the physical ability to be fitted for a myoelectric, a patient's ability to follow instructions, and their ability to successfully go through the training to use a myoelectric. The issue around training is important. Many of those who need prostheses are either very young or very old. There may be other

health issues which need to be considered. For trauma patients, there may be issues around neuropathic pain, which can make fitting a myoelectric arm difficult.

Myo-electric prostheses are high level prostheses. In Saskatchewan, even though there is universal coverage, patients have to graduate to be able to apply for one. This graduation would be through the demonstrated use of a conventional prosthesis. The reason for this graduation to a myoelectric is to help ensure the value for money. In particular, requiring a patient to wear a conventional prosthesis first is meant to help ensure that the patient has sufficient skills to be able to learn how to use a myoelectric arm and has a pattern of using a prosthesis. Given the costs involved in providing a myoelectric, participants felt that some protection needs to be in place to ensure that only people who are likely to regularly use their myoelectric prostheses get one.

Many of the participants in Saskatchewan felt that myoelectrics are not for everyone. As one provider has said,

> "many people will do way better with a traditional hook device than they will with a myoelectric hand. A myoelectric hand looks beautiful but it's, practically speaking, not very functional. The body powered devices are way more functional. They don't look nice and our society kind of has this Captain Hook mentality about it, but they're way more functional in terms of daily living."

Another participant said that "I think a lot of people have an image in their minds. They look nice and they have an image that they work well, and they're very disappointed." There are a number of other shortcoming participants expressed. While there have been improvements, powered upper arm prosthesis remain a significant weight. Traditional

prostheses do have more suspension. Children do not seem to like any type of prostheses. Myoelectrics can be hard to clean. Often the client has no interest or will indicate they do not want one. The team need to believe the client would be successful with, and regularly use, their myoelectric before the team recommends a myoelectric. For many clients, a traditional hand hook is preferred because it is better for continuing manual labour. This is an important consideration for rural farmers, who are injured on the job, but want to continue farming. There have been developments in myoelectric prostheses over the years. They are now easier to use. They are lighter. Their battery life is longer. They are more powerful. They can be made waterproof. There is the prospect of even further developments in myoelectric arms. The war in Iraq has increased the number of patients needing myoelectric arms. Related to this, the United States government has recently made significant investments into research in prostheses, including myoelectric. Still participants felt it is important to manage expectations. A myoelectric arm "is not a miracle or bionic arm which people see on television."

6.8.2 Coverage for Powered Upper Arm Prostheses in Saskatchewan

The Saskatchewan Aids for Independent Living (SAIL) Program provides universal 100% coverage for myoelectric prosthesis to those not covered by other insurance programs. There are some criteria the patient needs to meet before getting a myoelectric arm. In terms of the assessment criteria, participants said that they are based on historical practice. The government had always agreed to fund myoelectric prostheses. In fact, there was little discussion of whether or not to cover it. As one participant said, "is it just Saskatchewan's culture...We're the founders of Medicare." The SAIL criteria are there to

ensure that there are some limits on inappropriate use. The criteria include a requirement that the client demonstrate first an ability to function with a non-myoelectric prosthesis and demonstrate that there are some long-term benefits to using a myoelectric prosthesis. The SAIL program only covers the device that fits the client's basic need. The government is examining options to change its policy so that people can pay the difference between the basic and higher-cost options. Clients are eligible for a replacement prosthesis for a broken prosthesis or a prosthesis they have out-grow.

The program funds the two workshops that provide all the prosthetic work in the province. The Saskatoon Abilities Council is provided with direct funding to cover their staff and some overhead costs. The Wascana Rehabilitation centre is funded through the Regina Qu'Appelle Regional Health Authority. SAIL has fee-for-service schedules that reimburse these two centres for the cost of component materials.

Previously, the SAIL program used a provincial committee to determine whether someone received funding for a myoelectric prosthesis. This committee disbanded in the mid-eighties, due in part to the lack of numbers. Now applications are reviewed by the SAILs program on a case-by-case basis. The application is in the form of a letter from either a physiatrist or orthopedic surgeon outlining the case of the client to receive a powered upper arm prosthetics. Although SAIL program may request further information, it is very rare for a request to go forward to SAIL and be rejected. This lack of rejections is primarily due to the fact that participants felt that providers in the province do not usually submit frivolous requests. As one provider said, "we recognize that we

have excellent coverage in this province and we have a responsibility to the taxpayers, and we're all taxpayers."

Follow-up and training are also covered by the SAIL program. Good follow-up is important for myoelectric prostheses because it can increase compliance, e.g., addressing simple problems which may be uncomfortable for the patient. The only thing not covered by SAIL is sports prostheses.

While there is universal coverage for all prostheses in Saskatchewan, there are other funding sources. These include the Workers' Compensation Board (WCB), the Saskatchewan government-sponsored motor vehicle insurance (SGI), and national First Nations programs. For the SGI and WCB, the client is assigned a case worker who coordinates his or her care. The physiatrist's involvement with advocating for a myoelectric on behalf of their patient would be similar across all of these programs. The documentation is in the form of a letter from the physiatrist and the prosthetist. The reason for the lack of formal documents to apply for coverage is that the cases depend very much on the independent circumstances. While residents of Saskatchewan are eligible for the War Amps programs, because of the SAIL program, there are few applications to War Amps from Saskatchewan.

Table 6.8 summarizes the coverage given through the various programs for powered upper arm prostheses in Saskatchewan.

Table 6.8: Coverage for Powered Upper Arm Prostheses in Saskatchewan

Program	Who is Eligible?	Coverage
SAIL	Recipients not covered by other insurance programs	Full coverage
WCC	Employees injured at work	Full coverage
SGI	Injuries resulting from auto accidents	Depends on policy
Non-Insured Health Benefits (NIHB)	First Nations and Inuit Dissent	Full coverage
War Amps - CHAMP Program	People up to 18 years of age.	Full coverage
War Amps - Adult Amputee Program	People over 18 of age.	15 % towards the cost of prosthesis up to $1500.00 once every three years

6.8.4 The Allocation of Resources in the Prosthetics

The assessment for a myoelectric prosthesis would be conducted at either a hospital with an amputee clinic or the facility fitting the prosthesis. Prosthetics would be built and installed on fee-for-service basis with the bill going to the agency responsible for coverage in the case involved. There are two accredited facilities that have billing rights to Saskatchewan Health: Saskatchewan Abilities Council or Wascana Rehabilitation Centre. Both of these facilities change the SAIL program for services according to a set fee guidelines, with support also given by the province to support the general operations of the two facilities.

6.8.5 Resource Allocation Issues around Powered Upper Arm Prosthesis

The decision of who should receive a powered upper arm prosthesis is based on a team recommendation, with a physiatrist or orthopedic surgeon making a request for coverage. Funders and the patient would also be involved in recommending what is most appropriate prosthesis for the patient. This decision would be an example of collegial decision making.

The second question relates to the coverage of powered upper arm prostheses. While there is little communication between these programs to ensure that all people are fully funded for their prostheses, the provincial government does operate a program of last resort which ensures universal coverage.

Region C reported that there was little concern with how resources are allocated around powered upper arm prostheses, due to the fact that the cost of providing care is paid for by third-party insurers and that there are so few installed.

6.8.6 Powered Upper Arm Prosthesis and Evidence

Powered upper arm prostheses are seen as a proven technology and there is little concern expressed about their effectiveness. In terms of who receives a myoelectric prostheses, there are a number of factors looked at. These factors primarily focus on determining the ability of the patient to wear a myoelectric arm, the likelihood that he or she will benefit from a myoelectric prosthesis, and desired functionality of the patient. The information about all of these factors comes from examinations and discussions with the patient.

6.8.7 Powered Upper Arm Prosthesis and Cost

Because of the small number of people requiring myoelectric prostheses, there is no consideration of cost-effectiveness. For budgeting purposed, the net cost of equipment is calculated by examining internal data, checking with suppliers, through discussion with prosthetists and through the established fee schedule.

6.8.8 Powered Upper Arm Prosthesis and Ethics

Beyond the considerations about age and the likelihood of completing training identified in the other two provinces, there was little discussion of powered upper arm prostheses and ethics.

6.8.9 Powered Upper Arm Prosthesis and Accountability

There was a real concern with accountability and the wise use of resources reflected by all of the participants in Saskatchewan. One participant said that providers in the province,

> "recognize that we have excellent coverage in this province and we have a responsibility to the taxpayers, ...we have a responsibility to use funds appropriately and to be accountable for the funds we're using... and there's all kinds of ways we can be accountable. There's all kinds of formal ways - through audit processes and through criteria and prior approval and requisitioning authorities and there's accountability built into this, but we also have... we have a responsibility to be accountable in individual decisions that we each think every day in the shop. So I think that that again is our culture. It's built up over many years of a relationship where we don't mess with one another."

6.8.10 Overview of Powered Upper Arm Prosthesis

Table 6.9 reviews the main components elements relating to powered upper arm prostheses in Saskatchewan.

Table 6.9: Overview of Powered Upper Arm Prosthesis in Saskatchewan

Usage	1 new case provincial a year
Resource Allocation Decisions 1) Prescription 2) Coverage 3) Region C	 1) Clinical circumstances, collegial 2) Universal, last resort, public coverage 3) None specific to powered upper arm prostheses
Need	Number who present, patient population very small and stable
Evidence	Clinical circumstances of patients. Seen as an effective treatment for some patients.
Cost	Internal data, vendor supplied data, fee schedule.
Ethics	No specific concerns identified.
Accountability	Providers careful with public funding.

6.9 Best Practices Identified in Saskatchewan

There were a number of recommendations and best practices identified on how to improve resource allocation within Region C. Many of these best practices related to the working relations between people and to ensuring that all the appropriate people are involved in making a decision. It was generally recognized that when it comes to making resource allocation decisions, no one person has all the answers or all the required expertise.

Participants felt that Region C has good working relationships with the other main stakeholder groups in the province, e.g., the provincial government, physician groups. One of the reasons for this close relationship is the relatively small number of people working in the health care sector in Saskatchewan. Many people are familiar with the people they work with in other organizations and likely regularly work with them on a number of projects. This good working relationship has created a lot of good will between stakeholders and was seen as an important factor in helping Region C to push forward its strategic agenda.

A number of participants felt that as many decisions as possible, both resource allocation decisions and policy decisions, should be made at the program level. As one senior executive member said,

> "We have enormous trust and belief in the knowledge and the good intentions of the people who are closest to the ground, and I think they're in a far better position [to make many decisions about programs]."

The participant went on to say that ideally the senior executive should be only involved in decisions which require more resources than are available within the program area, a major shift in policy or if shifts in resources that would require a cut in some services.

In order to involve frontline staff more in resource allocation decisions, the organization need to ensure a good level of communication across the organization and the ability for staff to easily inform the senior leadership team about their concerns. Participants suggested that new information technologies are an excellent way to allow staff to engage

the senior leadership team, anonymously if they want. One of the senior executive said it is especially important to listen to frontline staff who work with vulnerable populations.

Collaboration and discussions between colleagues in other health regions and other provinces was seen as very valuable in reducing workloads and in making better decisions. As one participant said,

> "There isn't a week that goes by that we do not share documents and information with one another. We no longer recreate the wheel kind of thing, right, and it saves us thousands of consulting dollars."

One manager said that this inter-institutional and inter-provincial collaboration is good in capturing and adopting best practices across the country in their program area.

A number of other best practices were also mentioned. These include that decisions are made using good information about the needs of the local community. Some participants recommended the wider use of CADTH's quick literature reviews on emerging technology. Standardized monitoring and other measures were seen as important to running consistent and efficient programs. Although there are clearly problems with wait times getting too long, the focus on wait times was seen as another good mechanism for improving the efficient use of resources. Leadership and a clear champion were identified as important factors in bringing about change. One participant said that better fundamental business practices, like improvements in running meetings, are needed to improve management efficiency. Another participant said that there needs to be some limits and some criteria placed around demand. It was also suggested that a zero-based

budgeting exercise carried out across the region may be useful to readjust resource levels across the program areas. Another participant recommended an advisory group of physicians on coverage decisions.

When making decisions in one area about how to improve care, participants pointed out that you have to recognize that these resources have to be used wisely because they can be used to benefit other people in other program areas. Recognizing the wider use of resources is important to seeing all the different elements of an allocation decision. One participant said that "if you're only trying to make decisions to keep everybody happy, you will fail. ...and you usually never make everybody happy." Clear strategic decisions, made transparently and clearly identifying who has accountability, is often seen as being acceptable, regardless of which programs ultimately get funded. The wider adoption of these principles was seen as something which could also improve the process of resource allocation.

Table 6.10: Best Practices Identified in Saskatchewan

• Good working relationship with other stakeholders • Program level decision making • Good level of communication across the organization • Communication with other organizations and provinces • Good information about needs of the community • CADTH literature reviews • Standardized monitoring / Measuring wait times • Strong Leadership / a clear champion • Limits and criteria placed on demand • Zero-based budgeting • An advisory group of physicians on coverage decisions • Considering all the different elements of a decision • Clear strategic decision making • Increased transparency and accountability

6.9.1 Decision Aids Identified in Saskatchewan

Although there are no decision aids currently being used in Region C to help direct the allocation of resources, participants were generally supportive of the idea that a more structured process was needed. One of the difficulties identified around resource allocation is the fact that higher profile programs, e.g., cardiac care or child health, are more likely to be seen as a priority than other programs, e.g., programs focused on the disadvantaged or mental challenged, even though the need may be greater in the lower profile areas. The region has discussed establishing a process which evaluates requests for resources on a more equal basis as a way to avoid this bias towards funding high profile programs.

There was a feeling that some type of standard scoring system for new requests could also be an educational opportunity for the public. Although it is expected that there would be a great deal of public debate and challenge by those whose requests were ranked lower on the list, explaining to concerned groups why certain programs were ranked lower was seen as a way to get the public to appreciate how decisions are made by the health region. Educating the public and debating what the criteria should be used for making resource allocation decisions takes time, but it is seen as a way of better involving the public and ensuring greater accountability. This type of public engagement around resource allocation could also be a way to show government the level of public support for certain funding decisions. Engaging the public in such a program would also make it harder for government to overturn the choices identified by the process. Finally, it would give the government a means of counteracting particular interest groups who come to the Minister with their one off concerns.

A more structured process has not, however, been adopted by Region C. One area of concern has been about the effectiveness of the process. As one participant said, a standardized review of requests for new resources "would be ideal; but there are so many ways for these decisions and promises to get made that things still end up on that "A" list." In other words, given the numerous levels of decision makers involved in making resource allocations, there are numerous opportunities to sway decision makers and circumvent the process. Another participant expressed concern that the process is only applicable at a particular institutional level, and that higher levels of governance may not respect the decisions arrived at by the process. The participant said,

> "You can come up with what on the surface seems to be a very robust set of questions and criteria on which to score a very good process of variety of people scoring and averaging and, you know, the case. I've been involved with several strategic planning reorganizations within different departments and a few different provinces where we've come up with very good tools to score relative priority in programming and in programs - very robust tools. The challenge, as you say, comes in its level in decision-making where there may be an unpopular decision that occurs in your ranking. It makes logical sense but the person looking at it says, I can't cut that program even if it's the right one to cut; or it might be you send it forward, only to be told by the next level that you cannot [cut that program]."

Thus while a good deal of time and effort can be put into the priority setting process, it is likely that the process can be circumvented and all of that effort and public good will be lost.

Participants generally liked the accountability for reasonableness model as a possible basis for improving resource allocation decision making. One participant, based on his experience in another province, said that decision aids need to be supported by staff and modified to the particular decision making environment. One of the delays in further adopting accountability for reasonableness is deciding at which management level it is most productive to adopt the approach within Region C, e.g., at the program level generally or at the senior level just for new programs.

6.9.2 Challenges Identified in Saskatchewan

Participants in Region C identified a number of challenges the region faces in improving resource allocation. One participant talked about the lack of clarity in the roles and

responsibilities between the province and the regional health authority. Often the provincial government was seen as overstepping its role by trying to unduly influence the operation of the region. Another participant complained that the provincial bureaucracy has not really adjusted to the reality that they are no longer directly responsible for the delivery of care.

The lack of substantial new resources was seen as another obstacle. Given that in Saskatchewan there has been a fairly long period without substantial increases in health care funding, budgeting has usually focused on maintaining current levels of service. Related to this lack of new resources is the fact that a large proportion of resources are already accounted for so that there is not much flexibility to shift resources between programs. For example, increases in the cost of labour and drugs are fixed by the provincial government. Although they greatly impact the region's operating costs, the prices are established outside of the region's control. Participants also said that it is very hard to make substantial shifts in resources given the institutional culture within the health care system.

While Region C has had a fairly low turnover in its senior management team, there was a feeling that because of the transition period around having a new CEO that it has been difficult to establish a new process around resource allocation. On the other hand, another participant said that there is real need to bring in more new people into the organization. Although the staff are seen as hard working, very dedicated, and talented,

the participant pointed out that a large proportion of the staff have never worked in any other health care setting. As the participant said,

> "they had limited exposure in some cases to practice elsewhere, and that is important evidence.... We need to open those windows to expose folks to what other regions are doing, what some of that best practice is, help them to learn to access the evidence and apply it."

It seems then that there needs to be a balance between having some leadership stability and encouraging staff exposure to a variety of health care settings.

The difficulties around the execution of new policies were discussed. One participant talked about the need to have the idea, the will and the resources to bring about a change in policy. There was a feeling that it is difficult to have these three elements come together within most health care organizations.

Region C has seven levels of decision making. While management reported valuing the input of frontline staff, a number of participants recognized that there are too many management levels to efficiently allow for free flowing communications. Because of the multiple levels of decision making, it is also difficult to have a clear idea on who is responsible for making a decision. Often difficult decisions are transferred up for others to make. As one participant said,

> "this organization... the people [of this organization] really care about what they do. I may have some major issues about processes and support; but in terms of basic mitigation and people wanting to contribute and trying to get health care... We need to constantly leverage that. The challenge is

> how do you do that in an organized way so that people are comfortable making uncomfortable decisions and making tough choices."

As another participant said, "if it's an unpleasant decision to make, it will be delegated upward in the organization and it will be delegated outward to the funding," i.e., the provincial government.

Regarding diagnostics, one specific challenge identified was in communicating to other government departments (such as Saskatchewan Finance) the nature of MRI services, i.e., that there is constantly expanding demand, the range of technological advancement, and that older modalities do not get replaced even once more MRIs become available.

There was a good deal of discussion about the difficulty with making inter-provincial comparisons and about variations in the level of service in different provinces. One challenge with MRI is that even though the capacity for MRI is expanding in Saskatchewan, national benchmarks for the number of scans per population are increasing at an even faster rate. In discussion comparing Alberta to Saskatchewan, one participant pointed to the fact that the two provinces have very different histories and social mentalities. These cultural differences were seen to be exacerbated by Alberta's recent financial wealth. The participant said that these differences make it very hard to compare the health care systems in the two provinces. Another participant mentioned that one of the issues around new standardized wait times is that it will highlight differences in the level of services across provinces and will put further pressures on the federal government to address the inequality in services.

Participants pointed to the fact that there is insufficient management and a great deal of scrutiny of managers within the system. In particular, participants said that the level of management is proportionately less in public health care than in other industries of comparable size. As one program manager said, "you show me an industry that has a 26 million dollar budget and there's myself - and I have two managers - managing a 26 million dollar operation with 400 some employees." Similarly, participants talked about the relatively lack of investment in information technology in public health care compared to other industries. Participants also pointed to the workload that is placed on managers, which both undermines good management and may put too much strain on managers' health and family lives.

One participant suggested that decisions around drug coverage need to be tied into a larger process at both provincial and national level decision making, so as to avoid health regions making various decisions or facing the pressure from drug companies alone. The problem is that while there are national organizations which do analyze new technologies, as one participants said,

> "when you look at many of the provinces, there's a very limited staff that's capable of doing that kind of analysis or even interpreting the evidence, and to what extent would their recommendations be taken anyway in political context for funding allocation decisions."

Region C has considered whether it needs to hire people with expertise in health technology assessment or to give managers better training in critical assessment, cost-

effectiveness and technological assessment. But there are a number of issues around these types of investments. Most regions would not be able to maintain or afford such expertise. There is a question then in terms of whether larger regions should take responsibility for these functions for smaller regions. There are also issues around interregional variation in coverage.

The dilemma around public engagement was mentioned by a number of participants. Participants recognized that the public should be engaged in decisions around coverage and resource allocation. The problem of concentrated interest, where only those directly affected by a decision become involved, was often identified. Often these people are only engaged in the process to bring about a particular outcome or advocate for a particular issue. One participant recommended a wide public engagement exercise, like the one conducted in Oregon, as worth considering. Another participant said that he has been told by the provincial government officials that for a particular program request to be approved, it needs to be shown to have public support. The participant pointed out that often time the only available demonstration of public support are letters to the editor or to the Minster, submitted by a very small group of people.

Another challenge relates to programs creating an apparent crisis so as to force their priorities on to the budgetary agenda. There is always a level of uncertainty about how much this actually occurs within any organization. But a number of participants identified cases were this had occurred within Region C and other health regions. One

participant said that there needs to be greater transparency to ensure that the level of need for a resource request is not over sold.

The determinants of health model of health presents another challenge to health care organizations. While health care organizations recognize their great level of need, there is also a need not to short change other areas of government spending which positively impact on health, e.g., education, social services. The resource question is about what is the most appropriate size of the funding envelope for health. The level of funding for health relates to another issue of how funding for areas which help primarily the less advantaged, e.g., social services, should be balanced against the demands for health programs the benefit of which are seen to be more equally distributed to all groups, e.g., cardiac and cancer care. As one participant said "the fear is that you'll end up getting things that the rich or the middle class need at the expense of the issues that would help to fund the further determinants of health on that end of the spectrum."

Another challenge relates to the institutional history of the health care system. One participant said that "if we were starting from scratch" we would not build a health care system like the one we have now. For example, an ideal system would allow for greater investment in prevention. But we have to delivery care and make resource allocation decisions within the current system. The participant said that we should be guided in how we allocate resources more by the vision of how we would ideally like to construct the system and aim to move our current system towards that vision.

Other challenges identified include: insufficient data to properly evaluate the value of some programs; manager sometimes making decisions with fairly large resource implications that should be made by the executive team; organizational difficulties in implementing policy changes; the inability to access information in a timely manner; that appealing to evidence can make greater claims on resources than are available; that there is no clear process for retiring equipment or for transferring a service out of the system; and that often time changes in resource requirements do not result in savings, because it is too difficult to stop other programs using the resources.

Finally, the amount of resources required to do good resource allocation, in terms of the cost of involving the public, management time and administrative support, was seen as another impediment to improving resource allocation. The request for resources to set up an allocation process is seen as another resource request which needs to be approved. *Table 6.11* summarizes the challenges to improving resource allocation identified by participants in Saskatchewan.

Table 6.11: Challenges Identified in Saskatchewan

• Lack of clarity between the roles of the province and the region • Lack of new resources / Status quo budgeting • Resources already accounted for • Institutional Culture • Leadership stability / Varying work experiences • Difficulties executing new policies • Too many levels of decision making • Lack of accountability • Transferring difficult decisions • Communicating the specific nature of new health technologies (e.g., MRI) • Problems with public engagement • Difficulties in inter-provincial comparisons • Insufficient management staff • Insufficient investment in Information Technologies • False crisis • Institutional history • Difficulties in making cross provincial comparisons • Insufficient data to evaluate programs • Manager making decisions without consulting the executive • Difficulties in implementing policy • Lack of timely access to information • Appealing to evidence requires resources • No process for retiring equipment • Investments often do not result in savings, because resources are used by other programs • Good resource allocation requires resources

Chapter 7: Discussion of the Findings

Throughout this chapter, key findings are highlighted and then discussed. The chapter begins by presenting and discussing some findings common to all the key informants across the provinces and regional health boards. Next, provincial and regional differences are examined, including a comparison of the regional differences and similarities in the three areas of care: endovascular coiling, MRI and powered upper arm prostheses. The next section compares the embedded factors identified in the literature review, i.e., need, use of evidence, cost, ethical considerations and accountability, as they were applied to the three areas of care. The last section reexamines the proposed methods for improving resource allocation reviewed in sections 2.4.1 to 2.4.8 to determine their likely usefulness for the resource allocation decisions encountered in the last three chapters.

7.1 General Findings Across Provinces, Regions and Areas of Care

F1. Key informants are generally satisfied with the current allocation processes used within their organizations.

The key informants interviewed for this project work in different provinces and different service areas. Still there was a good deal of commonality in how these decision makers view health resource allocation. First of all, key informants were all generally satisfied with the processes for allocating health care resources currently used by their health regions and provincial governments. While no one felt these processes were perfect, their main concern was most often with a lack of resources, rather than how available resources are allocated. To the extent that key informants directly complained about the

allocation process, it was that some participants, most often at the program level, felt that people in their position should have greater say in how resources are allocated. Two participants expressed concerns about the amount of management time that already goes into budgeting and making resource allocation decisions.

This finding (F1) is important because it points to a disconnect between (a) the extent of the problems presented in the resource allocation literature and (b) the concerns regarding resource allocation decision making reported by participants in the three provinces. While recognizing the importance of spending public funds efficiently, ethically and in an accountable manner, participants interviewed for this project felt these goals can be achieved, and to a large extent are being achieved, by current allocation processes. Participants were generally negative in their assessment of proposals to employ more structured / explicit approaches or in using decision tools for allocating resources. There are a number of reasons for this negative assessment of more structured approaches, including institutional and stakeholder barriers to changing current allocation processes and the unique nature of many resource allocation problems. These reasons are similar to concerns raised by Hunter (1995) about making resource allocation processes more explicit. But another important factor this project has identified is that decision makers do not see an urgent need for change.

However, the academic work in this field (Daniels & Sabin, 1997; Daniels, 2000a; 2000b; Mitton and Donaldson, 2004; Peacock, Ruta, Mitton, Donaldson, Bate, & Murtagh, 2006) is having some influence on health care organizations. Although participants were

generally satisfied with current decision making approaches, they also recognized resource allocation as an important part of their management role and there was a good deal of interest in ways to improve allocation processes. Because of this interest, decision makers are quite open to proposals for improving allocation processes. However, rather than adopting any particular model, decision makers are taking some of the concerns that are articulated in these models, e.g., for fairness, accountability, efficiency, and trying to address them within their own institutional context. Thus, while these models are not being adopted as is, they do provide guidance to decision makers. For example, at least one decision maker in each of the three regional health authorities studied said they had conducted some type of review of these models when considering how to improve their own allocation processes.

Another important consideration is that these models are not meant to respond solely to decision maker needs, but are also developed to address concerns of those outside the system who want to make health resource allocation more transparent and open to the general public. Many of the calls for reform are made on behalf of people outside the system who are not comfortable with current allocation processes and want more input and greater understanding into how health resource allocation decisions are being made (Ham, 1995; Coast, 1997). It seems then that those who are making allocation decisions are satisfied with current, mostly implicit, methods of allocating health care resources. It is not necessarily the case that this comfort is shared by the wider public.

F2. **Participants were familiar with the factors associated with good resource allocation. "The best interest of patients" was unanimously identified by key informants as the most important factor in determining health resource allocations within their organizations. The institutional impact, including budget impact and staffing implications of allocation decisions, was widely seen as the second most important consideration.**

Participants showed a fairly good understanding of the factors identified in the literature as important to good resource allocation, i.e., decisions should be evidence-based, cost-effective, transparent, accountable to the public, and ethical. This is not to say that these factors exclusively determine how health care resources are allocated. There was some level of resignation by participants that there are situations in which health resource allocation decisions are based on considerations other than factors associated with good resource allocation, e.g., yielding to media, economic, political or stakeholder pressure. Teng, Mitton and MacKenize (2007) found a similar mismatch between decision makers' understanding of good resource allocation practices and how resources are actually allocated in British Columbia. Most key informants in this project were of the opinion, however, that the vast majority of resource allocation decisions are based on factors associated with good resource allocation and are made within the regular budget / allocation process.

Although health care organizations have numerous goals they are trying to achieve, and face various pressures, key informants unanimously identified the best interest of health care users as the most important factor in determining the allocation of health care resources within their organization. The belief that concern for patients is the driving

force behind the majority of budget decisions is likely one reason for the high level of key informant satisfaction with current allocation processes. Much of the difficulty in determining resource allocations is related to determining which allocations actually are in the best interests of a range of patients across numerous program areas and patient conditions.

The institutional affect, including budget impact and staffing implications of allocation decisions, was widely seen as the second most important consideration. One explanation for the mismatch between the level of comfort decision makers within the system have with current resource allocation processes compared with the level of discomfort of those outside the system may be the sense by those outside the system that budgetary concerns and concerns about institutional impact, not patient well being, drive most health allocation decisions.

F3. Key informants recognize the need to make difficult allocation decisions, but sometimes frontline providers feel isolated from the decision making process.

None of the participants in this project expressed any doubts about the necessity of health care rationing. A good deal of participants' time is directed to making difficult rationing / budgeting decisions due to limited health care resources. Whether or not there is sufficient wealth within Western countries to ultimately negate the need for limiting access to effective medical care, as Angell (2000) and Relman (1990a) suggest, participants in this project on a daily basis experience the challenge of resource

constraints within the Canadian health care system. For participants, health care rationing is very real.

Like other decision makers, frontline providers showed a good appreciation of the fact that resources are scarce within the public system and that they have a responsibility to use resources wisely. No participant, including the physicians interviewed, expressed any ethical concerns about providers having to limit care to some patients. The finding points to another disconnect between the allocation literature and the views of the key informants, in this instance relating to the debate concerning the ideal advocate model of the physician-patient relationship (Daniels, 1987). Concerns about physicians' primary obligation being to their patients, which are supposed to preclude any participation in the rationing of care, the driving force beyond the ideal advocate model, were not expressed by any of the participants. In fact, given the lack of established guidelines, it is frequently left to individual providers and program managers to determine what care they feel is of sufficient benefit to warrant providing it to patients out of public funds.

Some frontline physicians complained that they were not sufficiently involved in the resource allocation process and that this sometimes had detrimental effects on staff morale. With the provincial budget cycle usually starting in September and ending in late March, and frontline staff involvement usually being only at the beginning of the process and then usually only in a consultative role, a feeling of isolation among frontline providers is perhaps not surprising. This feeling of isolation illustrates that not only are physicians not morally opposed to being involved in rationing / resource allocation

decisions, as is suggested by (Boyle (1984), Daniels (1987), and Angell (1993; 2000), they also do not need to be encouraged to be more involved in these types of decisions, as suggested by Ubel (2001). Within the three provinces examined, institutional barriers appear to be the main limitation on further physician involvement in resource allocation. As per those who advocate greater physician involvement in rationing, e.g., Hall (1994), physicians interviewed for this project appear very willing to take on this role.

F4. Minor reforms of allocation processes are more likely than major restructuring.

In each of the three provinces, projects are underway to improve resource allocation, usually aiming at making aspects of the process more evidence-based, more transparent or more ethical. None of the organizations studied are considering, however, major reforms of their allocation processes. Major reforms would likely require some reallocation of authority within the health care system, either between the provincial government and the region or between the regional executive and the program / frontline level. Furthermore, major changes would likely require changes in how provincial budgeting is conducted. There seems to be little chance that provincial governments would substantially alter their current budget processes solely to improve health resource allocation, especially with the level of comfort health care decision makers have with the current arrangement. Unless affected by wider political forces (Tuohy, 1999), it is not unreasonable to expect that health care resources will continue to be allocated through the

basic structure of the current provincial budgeting process. Proposals for improving health resource allocation should then be made in accordance with these processes.

7.2 Provincial Comparisons

F5. The level of resources in a health care system can affect how resources are allocated within it. The richer province, Alberta, uses less targeted funding and consequently there is less provincial government involvement in specific allocation decisions as compared to the less affluent provinces of Newfoundland and Saskatchewan.

In all three provinces, the regional health authorities are funded almost exclusively through the provincial budget. There are, however, differences in the methods used across the three provinces for determining the size of each region's global budget. Alberta has the most structured approach, with a clear population-based formula for determining most global funding to its regional health authorities. Saskatchewan Health reported using a population-based formula to examine the proportion of their global funding going to the different regions, but they have in practice relied only on historical funding allocation with increases targeted to specific programs. Newfoundland has also primarily used historical funding patterns and targeted funding to determine each region's global budget.

Participants in Alberta said that Alberta Health and Wellness explicitly tries not to "micro-manage" their health care system. This philosophy is reflected in their more structured approach for determining the region's global budgets and deceased use of

targeted funding. As one participant from Saskatchewan said, the need to micro-manage health care resources comes from the historical scarcity of financial resources and that Alberta's choice not to do so simply reflects its strong financial situation. In other words, the level of resources in the health care system affects how resources are allocated within a province.

In comparison, in Newfoundland and Saskatchewan, there is greater provincial government involvement in making specific resource allocation decisions and greater use of targeted funding. In those two provinces, the provincial cabinet is regularly involved in making large spending decisions about specific program requests. As discussed below, the decision of whether to purchase a new MRI scanner is a clear example of this cabinet level involvement. While all health care systems are ultimately accountable to the provincial cabinet, the regular involvement of the cabinet in making specific allocation decisions brings another level of decision making in which specific requests can be fulfilled. It also risks increasing the influence of political concerns in determining which program requests get funded. For example, political calculations played a large part in determining where Newfoundland's latest MRI was located.

One reason for initially choosing to examine different areas of care in three provinces was to see if there was any inter-provincial variation in how health care resources are allocated. Aaron and Schwartz (1984) and Aaron, Schwartz and Cox (2005) had found variation in attitudes towards rationing between Great Britain and the United States. This project is the first to identify variations in how health care resources are allocated across

Canadian provinces or that there is a connection between the level of resources a province has and the process by which it allocates resources.

7.3 Regional Health Authority Comparisons

F6. Differences in available resources across the three regions studied presents a challenge to the ideal that Canadians have equal access to health care.

Region B (Newfoundland) has a wider scope of responsibilities than the other health regions, having the added responsibility for delivering both cancer care and social services. Even though it has the widest responsibilities, Region B also has the least amount of resources per capita.[22] Another key difference between the regional authorities studied was that Region A's (Alberta) size (over a million clients) and financial strength (an annual budget of $2.5 billion) were far greater than the other two authorities. In fact, Region A's client base and overall budget is greater than the entire health care system of either Newfoundland or Saskatchewan. Region A's size allows it to more easily absorb large equipment costs into its global budget without having to request increased funding from the province.

These differences in size and financial strength are reflected in whom the different regions see themselves benchmarked against. In Region B (Newfoundland) and Region C (Saskatchewan), participants talked about the need for their programs to meet the

[22] The economic data on the three regional authorities is summarized in Appendix B.

Canadian standard of care. In Region A (Alberta), participants said that they often benchmark their level of care by looking at what is being done at leading international centres, e.g., Mayo Clinic or the Houston Heart Centre. Only one participant in Region A mentioned Canadian standards of care and that was in the context of the role their region plays in setting what is the standard of care in Canada.

The fact that all of the provincial health care systems act in accordance with the Canada Health Act and are partially supported by the federal government may lead one to think that people in different provinces and different regions receive relatively the same level of care. Outside of the question of variations in clinical skills, which most participants felt did not exist across the country, the decision makers interviewed in this project recognize that there are clear variations in the level of resources different provinces and regions have at their disposal to provide care. We see these provincial and regional differences in coverage and access to care in each of the three areas of care examined in this project. Romanow (2002, p. xvi) claims that "equal and timely access to medically necessary health care services on the basis of need as a right of citizenship." While none of the key informants went so far to say there are geographical variations in patient care, it seems that the clear variations in the resources available, level of access to care, and who the regions benchmark themselves against identified by the key informants presents a significant challenge to the ideal that all Canadians truly share equal access to the same level of medical care.

7.4 Regional Health Authority Comparisons (Areas of Care)

7.4.1 Endovascular Coiling

Table 7.1 summarizes data presented in Chapters 4-6 regarding how the embedded elements of the resource allocation issues faced, need, evidence, cost, accountability and ethical considerations are treated in regard to endovascular coiling within the three regions.

Table 7.1: Overview of Endovascular Coiling

	REGION A (AB)	REGION B (NL)	REGION C (SK)
Resource Allocation Decisions	Clinical circumstances, collegial decision making. No rationing of care.	Whether to begin performing the procedure, including the purchase of coils, a bi-plane angiography suite and training.	Whether to start an endovascular coiling program. Most requirements in place. Program start decision not yet considered by executive.
Need	Determined by internal usage data.	Determined by internal data, estimates of frontline staff and discussions with other health regions.	Informally considered, based on estimates of frontline staff and cases sent out-of-province.
Evidence	Clinical circumstances of patients. Seen as an effective treatment.	An internal review of evidence for effectiveness and institutional impact. Seen as an effective treatment by staff, even though lack of sufficient research.	Not yet considered by executive. Seen as an effective treatment by staff.
Cost	Analysis of internal costing and usage data.	Determined by internal data, estimates of frontline staff and discussions with other health regions and vendors.	Program cost not yet calculated. Bi-plane angiography suite purchased.
Accountability	None specific to program.	None specific to program.	None specific to program.
Ethics	Few ethical issues.	Not discussed in deciding whether to start a program. Wider consideration of whether resources should be spent on a few critically ill patients.	Not discussed.

F7. How institutional approvals for a new service are achieved can differ depending on the institutional circumstances regarding that particular service.

The key difference between the regions concerns the type of resource allocation decision each faces regarding endovascular coiling. Specifically, the regions differ with respect to where they are in the process of adopting endovascular coiling. Region A (Alberta) has performed the procedure for about eight years. It has also recently established a formal endovascular coiling program with dedicated staff. Region B (Newfoundland) has identified endovascular coiling as one of its operational priorities and has requested funding from the provincial Department of Health to start performing the procedure, including purchasing a bi-plane angiography suite. Region C (Saskatchewan) has a number of the components in place for establishing a program, e.g., it is installing a bi-plane angiography suite and is currently training staff. Yet Region C's executive report neither having formally considered endovascular coiling nor having received a request from their Diagnostic Imagining program to begin performing the procedure. Furthermore, the executive are undecided about whether or not the program will be eventually established.

While both Region B (Newfoundland) and Region C (Saskatchewan) are moving towards starting endovascular coiling programs, there are clear differences in the way proponents of a program are proceeding in the two regions. In Region B, the Diagnostic Imaging program, in partnership with the Neurosurgery program, brought forward a proposal in

2004 to the executive to establish a program based on concerns about patient safety, particularly related to having to fly critically ill patients out of province. The executive conducted an initial review of the evidence supporting the technology. Even though the existing literature on the effectiveness of endovascular coiling was considered to be thin, the region's executive sided with the opinion of local clinical leaders and, in 2006, made a proposal to the provincial government for the extra funding to cover all of the elements required for endovascular coiling, including purchasing a new bi-plane angiography suite. For Region B, it is generally accepted by the executive, the radiologists and the neurosurgeons that there is a sufficient patient population to support a program in the province. The main issue for Region B is securing the necessary capital and operating costs.

In Region C (Saskatchewan), there is not unanimous support for starting an endovascular coiling program. Even amongst the radiologists, there is a good level of debate about whether starting an endovascular coiling program is a wise investment and whether the case load will be sufficient for staff to maintain their skill level. It is possible that because of the lack of unanimous support amongst the clinical staff that the management team of the Diagnostic Imagining program, while supportive, did not make a formal proposal to the region's executive to approve funding for endovascular coiling. Based on the interviews, a more likely explanation for why the Diagnostic Imagining program has not yet approached the executive is that the management team believes that the region has already indicated its support for the program. As one proponent of endovascular coiling said, "the region definitely has staked the ground that this [endovascular coiling] is a

service we want to provide." While recognizing that some staff are opposed, the same participant said that "definitely it's [starting an endovascular coiling program] going to happen." This feeling that the region has shown its support for endovascular coiling is partly derived from the decision to replace an old angiography suite, which needed to be replaced, with one which had bi-plane capabilities. While the capital purchase would have been approved by the executive, the selection of which angiography suite to purchase would have been made by an expert team within the Diagnostic Imagining department. The other factor which supported starting an endovascular coiling program is the decision to allow a new physician who is interested in getting training in this area to go for training. This decision was made by the Medical Director as part of the negotiation to recruit this radiologist. These two decisions have led the management team of the Diagnostic Imagining program to believe that the region supports the program and has already laid the ground work for establishing an endovascular coiling program.

Yet these were independent decisions. While some consideration of starting an endovascular coiling program in the future were likely part of the discussion, these decisions were made for other reasons than to establish an endovascular coiling program. It is also the case that neither of these decisions, about which angiography suite to purchase and the conditions used to recruit a physician, were made by the region's executive. Thus while the program feels these decisions show the region's support for starting an endovascular coiling program, the region's executive say they have never discussed the issue. In order to start performing coilings, Region C currently only requires an inventory of coils and funds to cover operational costs. Key informants at the

program level strongly expect the executive to provide these operational funds, but the executive report not even being aware that they are going to be asked to provide them and are skeptical that such resources would be currently available. It is perhaps not surprising then, given the situation in the two regions, that Region B has shown a greater institutional commitment to establishing an endovascular coiling program, even though it faces greater costs in order to establish a program.

F8. The difficulty of the resource allocation decision faced by a region often depends on where an organization is in the establishment of the service.

The decision to *establish* a program requires the consideration of numerous factors and substantial commitment of resources. *Once a program is established*, the nature of the resource allocation decision changes. In Region A, once the decision to invest in performing the procedure was made, the executive were no longer involved in the decision making decisions. Rather the main resource allocation question, i.e., whether or not to treat a patient, was made by the health care providers. In other words, there was a shift from meso- to micro- level decision making once the decision to establish a program was made (Lomas, 1997).

One of the dilemmas which the project initially identified regarding endovascular coiling is how to balance the high cost of establishing a program for a small patient population against the fact that it is a potentially life-saving procedure. We can see this dilemma play out in the type of resource issues faced by the different regions. Once the initial

infrastructure is in place and a program is established, the cost of performing an individual procedure is not significant when compared to the benefit received by the patient. In Region A (Alberta), which already had an endovascular coiling program, no consideration is given to cost-effectiveness or to rationing access to the procedure. Given the lack of rationing, in Region A, participants felt that there were no real ethical issues specifically related to endovascular coiling. Only in Region B (Newfoundland) did one participant discuss the need to look at spending substantial resources to treat a small number of acute care patients rather than seeing whether the resources could be more efficiently and ethically used to serve other patient populations. It was also only in Region B that a review of the existing research evidence for effectiveness was conducted.

F9. Variations in existing institutional capacity cause regions to perceive resource allocation decisions differently; and in some cases, ask different resource allocation questions.

Variations in existing capacities and infrastructure put some organizations in a better position to develop new programs and services. These variations in starting points can also cause regions to perceive resource allocation decisions differently, even when two organizations are at the same point in regard to the establishment of a new program. In the cases reviewed, we can perhaps even say that these variations in capabilities result in the regions facing different resource allocation problems. For example, even though Region B (Newfoundland) and Region C (Saskatchewan) are both considering whether to establish an endovascular coiling program, they face different costs. Region C is considering whether to purchase an inventory of coils and cover ongoing operational

costs. Region B is considering whether to train staff, purchase a bi-plane angiography suite, purchase an inventory of new coils and cover operational costs. For Region C, the further cost of starting an endovascular coiling program is in the hundreds of thousands of dollars. For Region B, the costs are in the millions. The different focuses in the discussions in the two regions, e.g., on the ability to maintain staff skill levels (Region C) and initial capital costs (Region B), are in part likely due to the difference in the total budget impact of starting a program for the two regions.

F10. The greater the financial cost of starting a program, the more likely participants will be concerned with the available research evidence and wider ethical considerations.

Region B faces the biggest cost in establishing an endovascular coiling program. It is the only region which conducted any review of existing research literature. It is also the only region in which any participant expressed any ethical concerns about spending so much money for a small group of patients. It should be noted, however, that even in Region B the evidence for and ethics of endovascular coiling were not seen as crucial aspects in the discussion around allocating resources to the program. Alternatively, it may be the case that these concerns for evidence and ethics only reflect the concerns of particular staff and that they are not directly related to the size of the required financial commitment.

F11. A better institutional starting point is not the most important factor in resource allocation decisions with respect to Endovascular Coiling.

The fact that a region is in a better position to start a program may not equate to a greater institutional commitment to establish that program. Other factors, such as staff opinion, whether clinical staff unanimously support a proposal, the emphasis placed on the need for a program, and other executive priorities also greatly affect a region's likelihood to push for the establishment of a new program. Although Region C (Saskatchewan) faces fewer costs in starting an endovascular coiling program due to its already having a bi-plane angiography suite and trained staff, Region B (Newfoundland) is currently more committed to the establishment of a coiling program.

7.4.2 MRI

Table 7.2 summaries how the embedded elements are treated with regard to MRI. Because each region faces the same types of resource allocation decisions around MRI, the table only summarizes the elements of need, evidence, cost, accountability and ethical considerations.

Table 7.2 Overview of MRI

	Region A (AB)	Region B (NL)	Region C (SK)
Need	Determined by internal usage data and management's judgment.	Determined by internal usage data, management's judgment, and CIHI data.	Determined by Saskatchewan Health using internal usage data provided by regions.
Evidence	Effective technology which is expanding both in capabilities and range of use. Research on effectiveness not considered.	Effective technology which is expanding both in capabilities and range of use. Research on effectiveness not considered.	Effective technology which is expanding both in capabilities and range of use. Research on effectiveness not considered.
Cost	Internal costing and usage data; discussions with vendors.	Internal costing and usage data; discussions with vendors.	Internal costing and usage data; discussions with vendors.
Accountability	Alberta Wait Time Registry; public reporting of usage data by region and site; activity budgeting.	Plans to establish public reporting of wait times; a good deal of media and political concern.	Activity-based budgeting; General government accountability; Diagnostic Imagining Network.
Ethics	Few ethical considerations.	Few ethical considerations.	Few ethical considerations.

F12. While MRI resources are managed similarly at the program level, there are differences between the regions in terms of who makes purchase decisions and the importance of federal transfers in purchasing new MRI scanners, due largely to the comparable size of these purchases in relation to each region's overall budget.

While there are substantial variations in MRI capacity across the three regions (CIHI, 2005), the management of MRI resources is fairly similar at the program level. In fact,

across the three regions, there are few differences in how the five embedded elements outlined in *Table 7.2* are treated. In all three regions, only specialists are able to order MRI tests. In all three regions, radiologists prioritize MRI requisitions. The criteria for prioritizing and priority classes are similar in each region. In both Region A (Alberta) and Region C (Saskatchewan), wait time guidelines are determined by the region and the provincial government. Region B (Newfoundland) did not report having formal wait time guidelines, but it and the provincial government both closely watch MRI wait times. A number of participants said that they soon expect national guidelines and standardized reporting for MRI wait times. The booking of cases was managed at the program level across the three regions.

There are a number of reasons why MRI is managed fairly consistently across the regions. Decisions around MRIs have a greater degree of public, political and media scrutiny than most other service areas, which ensures a certain degree of management focus. Diagnostics, including MRI, are one of the five funding priorities identified by the 2003 Health Accord, which also helps focus management attention to the area. There are efforts by CIHI (2005) and the Health Council of Canada (2007) to better measure and standardize the measurement of MRI capacity and MRI wait times. There are other projects developing national guidelines around wait times and the type of cases for which MRI should be used. For example, two participants said that the Canadian Association of Radiologists is currently working on guidelines to determine which cases should be examined by MRI. The focus of federal funding, the move to better measure MRI capacity and wait times, the development of national usage guidelines, and the nature of

the technology itself, all help to limit the variation in the management of MRI resources. Participants also said that there is a good deal of information sharing around MRI usage and management across provinces at the program level, especially between managers of Diagnostic Imaging programs.

The main difference in MRI resource allocation across the three regions relates to the expansion of MRI capacity, and in particular, the purchase of MRI scanners. Region B (Newfoundland) and Region C (Saskatchewan) reported that the purchase of MRI machines is often dependent on federal funding programs. For example, the 2003 Health Accord money was often mentioned by participants and did increase MRI capacity in both regions. No participants from the Alberta region mentioned Health Accord funding directly. In Region B and Region C, the decision to purchase an MRI machine would be made by the provincial cabinet. For Region A (Alberta), participants in both the provincial government and the regional executive reported that the decision to purchase a new MRI machine would be made solely by the region's executive. For smaller health regions in Alberta the situation may be different, but Region A was seen to have sufficient resources to internally decide to purchase an MRI machine without significantly distorting its overall budget.

F13. Once a technology is adopted and providers and decision makers become familiar with it, there is much less scrutiny of the expansion of the technology into new areas.

MRI is expanding both in its capabilities (Fujita, 2007; Strijkers, Mulder, van Tiborg & Nicolay, 2007) and in the range of cases being recommended for MRI scans (e.g., Bagarinao, Nakai & Tanaka, 2006; Lima & Desai, 2004; Richard, Bowtell, Mader & Melia, 2005; Zur, Holland, Yuan, & Choo, 2004). The expanding use of MRI technology was not reported to be an important issue for Region B (Newfoundland) and Region C (Saskatchewan). Radiologists in both regions said that current usage of their MRI machines stayed well inside the range of recognized standard practice. Region A (Alberta) reported that they looked to "centres of excellence" around the world to help them determine the range of cases for which MRI should be used. MRI is widely seen as an established, effective technology, which is the standard care for numerous medical situations.

While all participants with management responsibilities for MRI recognized the developing nature of MRI, no participant expressed the need to review evidence of effectiveness for these new applications. Once a technology is adopted and providers and decision makers become familiar with it, there seems to be much less scrutiny of the technology even if its use is extended to areas not considered when the technology was first adopted. Once adopted into the system, the usage creep of the technology is not rigorously evaluated, even though it affects the amount of resources a program requires. As one participant from Region B said, what often happens with expanding MRI into new types of scans is that physicians start ordering the test for the new condition and, after while and some internal discussions between the radiologists, the radiologists start conducting tests in the new area. The only barrier, used in all three regions, to limit the

expansion of MRI usage into new conditions is a budget limit on the overall number of scans a region will perform. With only a finite number of scans to be performed by a program annually, new applications need to compete with more established uses of the technology for scans.

7.4.3 Upper Powered Arm Prostheses

Table 7.3 summaries how the embedded elements of need, evidence, cost, accountability and ethical considerations were treated in regard to powered upper arm prostheses across the three regions.

Table 7.3: Overview of Powered Upper Arm Prostheses

	Region A (AB)	Region B (NL)	Region C (SK)
Need	Determined by program usage data.	Number who present, patient population small and stable.	Number who present, patient population very small and stable.
Evidence	Clinical circumstances of patients. Seen as an effective treatment for some patients.	Clinical circumstances of patients. Seen as an effective treatment.	Clinical circumstances of patients. Seen as an effective treatment for some patients.
Cost	Internal data and vendor supplied data.	Internal data and vendor supplied data.	Internal data, vendor supplied data, fee schedule.
Accountability	Professional standards and general government accountability requirements.	Move to develop quality indicators.	No specific concerns identified.
Ethics	Age-based restrictions on care.	Lack of coverage.	Providers careful with public funding.

F14. Programs with small patient populations and relatively small costs often do not get on the regional or provincial agenda, creating significant barriers to major program reform.

While there is insufficient coverage for powered upper arm prostheses in two of the three regions studied, there was very little consideration given to this issue at either the regional executive or the provincial government level. In fact, in all three regions, only participants who were directly involved in the management of rehabilitation programs report giving any consideration to powered upper arm prostheses. Not only were powered upper arm prostheses not on any of the regions or provinces' current agendas,

but most participants felt that coverage and program structures reflected decisions made in the past about how to handle prosthetics generally. Alberta did report conducting a recent review of funding levels for myoelectrics, in which funding levels were increased. But overall, decision making around power upper arm prosthetics is limited to clinical decisions at the program level.

The literature on agenda setting (e.g., Howlett & Ramesh, 2003; Bryan, 2005) suggests that there are numerous ways issues can get on the political agenda. These include institutional focus on changing standard indicators, sudden catastrophes or interest group pressure. Part of the reason for the lack of high level attention to prosthetics, and power upper arm prosthetic in particular, is that none of these factors currently favor prosthetics. None of the regions studied report indicators on the quality of care given to people with myoelectric prosthetics. There are a very small number of people who need myoelectric prosthetics. As one participant said:

> "if we had an epidemic of upper extremity amputees, we probably would need to seriously look at which people get myoelectric limbs. Since there are so few, I don't think it's a lot of money from the provincial budget."

Because of the small number of patients, there are no strong interest groups for patients. Furthermore, the number of people needing prosthetics is decreasing due to a substantial reduction in the number of birth defects and accidents across the population. Participants in Region C (Saskatchewan) reported that they previously had a committee to review all myoelectric cases in the region, but that the committee has disbanded due to the

decreased number of cases in the region. Unlike cerebral aneurysms, powered upper arm prosthetics are not life saving. In fact, many people who experience upper extremity loss choose not to have one. Some participants expressed the view that causalities with extremity loss from the wars in Iraq or Afghanistan could push greater technological advancements in the area of prosthetics. It is unclear whether these events will also help to focus greater regional / provincial government attention on coverage for myoelectrics.

Not making it on a region's agenda above the program level has implications for the underlining structure of prosthetics programs. Without being considered by higher level decision makers, it is difficult to make major program changes or extend coverage once a public insurance program has been established.

7.5 Comparison of Embedded Factors

Table 7.4 presents a summary of the key findings pertaining to the embedded factors of need, evidence, cost, accountability and ethics related to the three areas of care examined in this study.

Table 7.4: Embedded Factors by Areas of Care

EMBEDDED FACTORS	AREAS OF CARE		
	Endovascular Coiling	**MRI**	**Powered Upper Arm Prostheses**
Need	Determined by internal usage data, estimates from frontline staff and discussions with other health regions.	Determined by internal usage data, CIHI data and management judgment.	Determined by program usage data and the number of patients who present.
Evidence	Seen as an effective treatment. Region B conducted an internal review of evidence for effectiveness and institutional impact.	Effective technology which is expanding both in capabilities and range of use. Research on effectiveness not considered.	Clinical circumstances of patients. Seen as an effective treatment for some patients.
Cost	Analysis of internal costing and usage data, estimates from frontline staff and discussions with other health regions and vendors.	Internal costing and usage data; and discussions with vendors.	Internal data and discussions with vendors.
Accountability	None specific to program.	Activity-based budgeting, general government accountability, and public reporting of wait times	Professional standards and general government accountability requirements.
Ethics	Few ethical concerns raised.	Few ethical concerns raised.	Lack of universal coverage, age-based restrictions on care.

7.5.1 Need

F15. In the three areas of care, need is determined primarily by internal usage data and requests from stakeholders and staff. However, other factors also drive perceived need for the diagnostic service examined in this study.

While there is a lively academic debate about the definition of need in health care (see Chapter 2, Section 3.1), there was no doubt amongst participants about how need is defined in the three areas of care: patients who have been prescribed or present for a particular service. This definition perhaps best matches Witter and Ensor's (1997) definition of need defined in terms of the health services a person requires, but it also matches elements of Donabedian's (1973) definition, which relates need both to the patient's desire to have care and the physician's opinion that care is needed.

Following Donabedian (1973), physician opinion clearly affects the level of need in the area of power upper arm prosthetics. Key informants in Newfoundland reported there being, on average, only two or three patients receiving their first myoelectric prostheses annually. This is the same number reported for Alberta and double the number reported in Saskatchewan, even though these provinces have more comprehensive insurance coverage and substantially larger populations. This variation in demand for the service appears to be based on variations in clinicians' opinions of the benefit of the technology. Many prosthetists and physiatrists felt that very few people with upper extremity loss will benefit from myoelectric prostheses, so they are only rarely ordered. This was especially

the case in Alberta and Saskatchewan. In Newfoundland, providers viewed powered upper arm prostheses more positively.

It may, however, also be the case that clinicians are more mindful of ensuring a sufficient level of benefit when spending public health care dollars. This concern for spending public funding was expressed by physicians in both Saskatchewan and Alberta. If this is the case, ironically, wider public coverage may result in less access as providers become more apprehensive to prescribe myoelectrics knowing a fixed amount of funding also covers other types of assistant devices. In comparison to endovascular coiling and MRI, it was very noticeable how careful providers and managers in this field were with resources and ensuring that patients will benefit from care before providing treatment. With powered upper armed prosthetics, patients must be able to convince providers they will benefit from a myoelectric prosthetic before providers agree that a patient needs one.

Program need was similarly determined for two of the services: endovascular coiling and powered upper arm prostheses. Because both services have extremely small and fairly stable patient populations from year to year, estimates of need are determined primarily by analyzing internal usage data from the previous year. For regions which do not offer endovascular coiling, estimates for this service were developed from contacts with other regions, examinations of the number of cases sent out of province, and estimates from frontline staff.

While internal usage data for the previous year is the main source of determining the need for MRI, the expanding nature of demand for the technology also forces decision makers to identify drivers of demand and estimate their likely impacts. As one decision maker said, with MRI, estimating demand is "a layering process." Unlike the other two services examined, decision makers know that in determining their budgets they are not allocating sufficient MRI resources to meet all of the demand for the technology. In the other two services, budgets much more closely match the level of need in the population.

While two of the regions reported the importance of using needs assessments for determining the health needs of specific communities, these assessments have been used, to the extent that they have been used at all, more for public health and social services, rather than acute, diagnostic or rehabilitative care. At the regional level, requests from frontline staff and key stakeholders, e.g., politicians, community organizations, were generally taken as valid indications of the need for the requested service.

7.5.2 Evidence

F16. Different kinds of evidence are considered in resource allocation decisions relating to the three areas of care; research evidence is not the major source of evidence utilized.

Evidence of effectiveness, as confirmed by research studies, was not a substantial consideration in allocating resources in any of the areas of care examined. The vast majority of participants in each area already saw their particular services, i.e.,

endovascular coiling, MRI or powered upper arm prostheses, as an effective treatment option. A review of the research evidence was conducted for one area of care (endovascular coiling) in one region only and that review did not appear to have much influence on the decision whether to ask the provincial government for increased resources for the program.

Rather than looking at the effectiveness, decision makers in the three areas of care were more concerned with the need to make the "business case" for resource requests. Similar to a jury system, the executive in all three regions consider a number of factors and types of evidence, not just research evidence, when deciding on whether to approve a request. The specific factors considered depend on the request being proposed and concerns the executive have with it. While factors such as cost, patient and operational impact were common for all requests, other requests for information would reflect executive members concerns with a particular request for resources. Although not as formal as some proposals for constructing deliberative processes, e.g., Cuyler and Lomas (2006), there is a clear melding and weighing of different types of evidence in making allocation decisions across the regions within each area of care.

For the three areas of care, internal operational data is the most important source of evidence when making resource allocation decisions. This reflects the importance of institutional impact in deciding how to allocate resources. Decision makers suggested that they need to improve on their use of the information their organizations generate in order to make better, more evidence-based, allocation decisions. The experience of other

regional authorities with a service is also considered a key source of information. This was especially the case for endovascular coiling, which two of the regions do not provide. Searching the literature for evidence of effectiveness is usually only done for more unfamiliar technologies.

Dobrow, Lemieux-Charles, and Black (2006) have shown that the use of evidence in decision making changes depending on the decision making context. One of their findings is that there is a change in the underlying question which evidence is used to address as a technology becomes more established. There is a move from a general concern with whether the technology is effective to the more context-specific question of whether it would work in a specific operational environment, i.e., will it work for us? The primary concern for participants in this study, determining operational impact of enhancing an area of care (rather than determining effectiveness) seems to accord with Dobrow, Lemieux-Charles, and Black's findings. The problem with this move to see a technology as effective, as noted above with respect to MRI, is that a familiar technology can be expanded into innovative uses, which should also be evaluated in terms of effectiveness, but are not because people feel that they are familiar with a technology.

Decision makers across the provinces and regions felt that they do a fairly good job in using evidence and that they strive to ensure their decisions are evidence-based. This partly reflects the numerous sources of evidence decision makers see themselves drawing on. For example, some regional executive members hold that the opinion of frontline staff and program management are sufficient to determine effectiveness. As one

participant said regarding endovascular coiling, the leadership of a department "wouldn't be out there suggesting we should do it unless there's good documented proof that it is viable." In other cases, appeals to evidence are sometimes used to defer requests from frontline staff, putting another step in the review process and allowing for some "push back" for certain resource requests.

7.5.3 Cost

F17. In none of the areas of care across the three regions examined was cost-effectiveness analysis considered in allocating resources.

Cost considerations across the three areas of care almost exclusively focus on the budget impact to the decision making organization. In other words, from a cost perspective, the three regions are concerned primarily with the impact of their decisions on their available financial resources. Indirect costs related to human resources, space and time on shared equipment were also considered to some extent, depending on the specific allocation faced and the level of focus on the decision. For example, all of these issues were discussed in Region B (Newfoundland) concerning the starting of an endovascular coiling program. Added costs for other stakeholders, particularly patients, were also sometimes considered, but had much less impact on actual allocations. In most cases, costing is based on historical costs adjusted for known inflationary factors, e.g., wage increases or increases in service levels. For services not already provided by a region, e.g., endovascular coiling in Region B (Newfoundland) and Region C (Saskatchewan), estimates from frontline staff, communications with other provider organizations who

already provide the service, and contacts with vendors are used to determine the likely capital and operational costs for a new program. For neither of the areas of care was the cost-effectiveness of the treatments considered.

7.5.4 Accountability

F18. Although there is a good deal of concern with accountability, actions aimed at increasing accountability mostly occurred outside of the program level for each area of care. There is a much greater focus on accountability measures for MRI than for endovascular coiling and powered upper arm prostheses.

Accountability in health care has number of different aspects. Awad, Flood, and Abelson (2004) point to the need for greater transparency and public engagement as means of increasing health care accountability. Neumann et al. (2005) call for more explicit decision making processes. Relman (1998) closely ties calls for increased accountability to improvements in the measurement and assessment of health care services. While decision makers in the three areas of care all felt that accountability was important in the spending of public funds, there was less uniformity in actions taken to improve different aspects of accountability across each area of care. In terms of accountability, participants usually pointed to features of their wider corporate structure as helping to ensure accountability, rather than pointing to program specific measures. Decision makers identified their boards as representing the public and defending the public interest. Limits and requirements placed on government agencies, including regional health authorities,

were also often identified as helping to ensure accountability to the public. For example, because the regional health authorities are provincial government entities, they are subject to public accountability legislation, government procurement guidelines, and audits by the auditor general.

There is a good deal of work being conducted on developing indicators for MRI, both around wait times and appropriateness of use. One participant in Region B expressed the view that their prosthetics department needs to develop better performance measures. Next to that, no participant felt that better performance measures were required in either the area of prosthetics or endovascular coiling. This reflects the very small patient numbers for both programs and the lack of public / political attention focused on these two areas of care compared with MRI. It is interesting that the push for improved wait time and appropriateness measures for MRI are coming from a number of agencies and groups, e.g., FPT Ministers, the Health Council of Canada, Canadian Institute for Health Information, the Canadian Association of Radiology, and are not being initiated at the program level itself. Similarly, we see an increase in public reporting around MRI, but not for endovascular coiling and prosthetics, again being pushed mostly by the federal and provincial governments. In neither of area of care did participants feel that more explicit decision making processes or directly engaging the public about their service was necessary, although some participants felt that higher level discussions with the public about service priorities could be useful.

7.5.5 Ethics

F19. While participants identified the importance of the ethical implications of how they allocate health care resources, explicit considerations of ethics played only a minor part in the allocation of resources in the three areas of care studied.

Like accountability, participants all recognized the importance of allocating resources ethically. Participants identified concerns about how patients are treated and the need for a fair and transparent process for allocating resources as key factors in how their organization makes allocation decisions. General concerns were expressed in all three regions about the bias towards funding high cost acute care programs as opposed to funding more community-based programs, prevention programs or less high profile programs, e.g., in areas like mental health. Region B (Newfoundland) has started a pilot project which requires all programs to consider the ethical implications of their budget requests in terms of who is not getting services. Region C (Saskatchewan) has examined Accountability for Reasonableness framework as a possible means of explicitly incorporating key ethical considerations into their allocation process, but has not yet used the framework in the process of allocating resources.

Still there were no program specific measures to ensure that allocations were ethical within any of the three areas of care. It is also unclear how much weight ethical concerns have in making allocation decisions or even whether ethics is made an explicit consideration, as the pilot project in Region B aims to make them. With that said, none of the participants in either area of care expressed any concerns about how ethical their

method of allocating resources is. One particular ethical concern raised by the researcher was that, in Region A (Alberta), coverage for powered upper arm prostheses under the provincial plan is limited to those under the age of 65. This raises the issue of age-based rationing, at least hypothetically. Participants said, however, that this restriction has never been applied in practice because the program has never had a person over the age of 65 assessed for, or request, a myoelectric prosthesis.

Ubel (2001) points out that our choices around values always play an important part in making allocation decisions. For each of the three areas of care studied, this may be the case, but these value determinations seem to be often left as an implicit part of the deliberations, rather than being a focus of how resources are allocated.

7.6 Decision Making Approaches Revisited: Challenges and Opportunities

Chapter 2, Sections 4.1 to 4.8, examined eight proposed approaches for improving resource allocation. The approaches studied were rational decision models, clinical practice guidelines, needs-based capitation models, screen models, cost-effectiveness analysis, program budgeting and marginal analysis (PBMA), accountability for reasonableness, and calls for increased public participation. This section reexamines these approaches to determine their likely usefulness for the different resource allocation decisions identified by this project. Before examining the eight proposed approaches individually, it is useful to make some general observations which impact the possible application of all formal decision making models seeking to improve resource allocation.

7.6.1 General Observations

F20. The multiple decision points within regionalized health care systems, the transferability of decision making authority, varying institutional structures and the lack of transparency in decision making for higher level decision makers, e.g., provincial cabinets, present challenges to all decision making approaches due to the fact that these approaches need some level of decision making stability. Not all resource allocation decisions, however, face these problems.

This project is unique in that it is the first in Canada to compare resource allocation decisions across different provinces and across different service areas. It is also unique in that it traces the decision making processes across four levels of decision makers: frontline providers, departmental managers, regional authority executives, and provincial government officials. This expanded examination of resource allocation decision making brings to light a number of new difficulties for those trying to improve health resource allocation through the use of more structured decision making approaches. Many of these difficulties are often overlooked by the academic literature.

Perhaps the most difficult challenge arises from the multiple points of decision making authority within current regional structures. Most priority setting models do not account for the fact that there is a hierarchical structure with multiple decision points within the regionalized Canadian health care system. Along with these multiple points of decision making, there is transferability and instability regarding who makes the ultimate decision regarding specific allocations. For example, in a case mentioned by one of the participants, a Minister of Health was directly involved in booking a MRI time for a patient whose case was the focus of a good deal of media coverage. The heavy

involvement of Saskatchewan Health in the running of diagnostic programs is another example of the ultimate decision making authority not resting with the decision makers who one would think are responsible for resource allocation decisions in an area.

Most of the proposed decision making approaches require decision making stability. Without stability in who makes a decision and in what factors are being considered, there is always the possibility that the effort and resources put into a priority setting exercise at one level will be wasted as higher level decision makers sequester a decision and decide it on their own terms. There is no guarantee that higher decision points will respect, or even consider, priority work done at other levels. The relevant factors for a decision are also likely to change for different sets of decision makers with divergent managerial and governance responsibilities. Participants reported that this transfer in decision making authority can happen without notice and without any reasons being given why it has occurred. In the real world, there is a greater uncertainty and irregularity in who actually makes different resource allocation decisions than is suggested in the resource allocation literature.

There is also a lack of transparency which arises due to the involvement of provincial governments, and in particular provincial cabinets, in the allocation process. Cabinet level decisions, advice from Treasury Board to cabinet, discussions between different levels of government, e.g., federal-provincial negotiations, all of which can have large impacts on health resource allocations, have an inherent lack of transparency. Decision making approaches which rely on transparency thus cannot be applied to these higher

levels of decision making authority. For example, the Accountability for Reasonableness model holds that the reasons for why decisions are made should be made available to the public. This approach does not seem to be viable for this higher level decision making. Likewise, it seems that this lack of transparency limits the opportunities for public engagement.

A third barrier to the applicability of these decision making approaches is that the processes for allocating resources in each organization are developed in response to the unique history and culture of the institutions in question. It is also the case that while the institutions examined each shared similarities, they all had at least slightly different decision making structures. These structures seem more receptive to some of these decision approaches than others. For example, Region A (Alberta) has Community Health Councils, which are a good conduit for public consultations. Region B (Newfoundland) has a regional ethics committee, part of whose mandate is to examine the ethics of how resources get allocated. These institutional differences make it harder to make blanket recommendations for the use of any one approach across all institutions.

While there are clearly difficulties related to the transferability of decision making authority, the lack of transparency related to some decisions, and the various health organizational structures, there is still the opportunity for these decision making approaches to improve resource allocation. There is always the risk of an unexpected transfer of decision making authority, but nonetheless a large number of health resource allocation decisions are made year after year by the expected decision makers, e.g.,

program managers do often make program level decisions without any interference from higher level decision makers. In these situations, there is clearly an opportunity for formal decision making models to make a contribution to improving resource allocations.

Table 7.5 reviews the eight decision approaches in terms of their likelihood of being able to address the allocation questions identified in the case studies. Further discussion of each approach follows.

Table 7.5: Applicability of Decision Approaches

	Applicability	Comments
Rational Decision Models	Not Applicable	Not Likely to be Applicable.
Clinical Practice Guidelines	Not Applicable for endovascular coiling or powered upper arm prostheses. Some attempts to apply to MRI, but with limited success.	Not Likely to be Applicable.
Needs-Based Models	Not Applicable, beyond the general allocations of resources	Not Likely to be Applicable.
Screen Models	Not Applicable	Not Likely to be Applicable.
Cost-Effectiveness Analysis	Not used in any of the cases.	Not Likely to be Applicable.
PBMA	Difficulties around setting weighting criteria; difficulty weighing preferences.	Could be applicable to some resource allocation decisions.
Accountability for Reasonableness	Not sufficient to determined allocations	Could be applicable to some resource allocation decisions.
Public Participation	Some times impractical; Unable to meet expectations.	Could be applicable to some resource allocation decisions.

7.6.2 Rational Decision Models

Chapter 2, Section 4.1 summarized the strengths, weaknesses and likely application of **rational decision models**. These models were seen as being likely inapplicable to health resource allocation decisions. Nothing in the cases examined has changed this assessment. In general, the allocation decisions examined are too multi-factorial and complicated to be effectively modeled in the manner that rational decision models require.

7.6.3 Clinical Practice Guidelines

Clinical practice guidelines help limit health care demand by placing restrictions on what procedures physicians can order. It is unlikely that clinical practice guidelines would work in the areas of either endovascular coiling or powered upper arm prostheses. In both cases, there are a number of factors which need to be assessed on an individual basis in determining the most appropriate care. This need for individualized assessments and also the very small patient numbers do not make the development of clinical practice guidelines viable in these areas.

There was, however, a good deal of interest in clinical guidelines for MRI usage. Guidelines for MRI have been proposed for both choosing MRI as the most appropriate modality and around MRI wait times for different conditions. As an access measure, all of the regions have guidelines around acceptable wait times for MRI and two of the regions, Region A (Alberta) and Region C (Saskatchewan), have publicly reported

benchmarks. These guidelines identify system pressures that can affect resource allocations.

In terms of which diagnostic modality to choose, some guidelines have been developed. The most prominent have been produced by the American College of Radiologists, although participants report that the Canadian Association of Radiologists is about to release new guidelines. Participants felt that there was some possibility of using these guidelines for training new physicians, but that the difficulties in changing established physician practice and with the enforcement of these guidelines make their wider application impractical.

7.6.4 Needs –Based Population Models

Needs-based population models are used by the Alberta government to determine a large proportion of the regional health authorities' global budgets. Saskatchewan Health has also experimented with using such models to evaluate how resources are allocated to its regions. These models are best used for broadly distributing health care resources across populations, particularly geographically disbursed populations. They have a more limited application to decisions made within health regions, where the regional executives are accountable for addressing needs for an already defined population, often in a reasonably small geographic area.

Needs-based population models also do not seem to be helpful at the program level, similarly due to limited population size. This is especially true for endovascular coiling

and power upper arm prostheses. Because of the very small patient population requiring a highly specialized service, it makes sense to centralize resources for these types of services rather than to distribute resources fairly across a geographic area. There is not sufficient service need to sensibly try to allocate resources on a population basis. For power upper arm prostheses, one participant reported knowing on a first name basis almost everyone in the region who had a myoelectric prosthesis. In fairness to those who advocate these models, they are not intended to be used at either the meso and micro level of decision making.

7.6.5 Screen Models

Screen Models, like Deber's four-screen model, are better suited to making coverage decisions than for making allocation decisions. The screen models which have been proposed also seem better suited to making "in or out" coverage decisions rather than decisions about the extent of coverage, as is illustrated in the case of partial coverage for power upper arm prostheses. Screen models are therefore likely not useful for assisting in the resource allocation decisions identified in this project.

7.6.6 Cost Effectiveness Analysis

While cost-effectiveness analysis is a valuable tool in evaluative some resource allocation decisions, it does not appear to be particularly useful with respect to the allocation decisions in the three areas of care examined in this study. Diagnostic imaging, including MRI, is a difficult area in which to apply cost-effectiveness (Weinstein, 1998). For endovascular coiling, the seriousness of cerebral aneurysms and the relatively small cost

difference between the two main treatment options, endovascular coiling and endovascular clipping, greatly limit the applicability of cost-effectiveness analysis in that area. For powered upper arm prostheses, cases are so rare that the budget impact can be easily considered on a case-by-case basis. Cost-effectiveness analysis was not used in any of the cases considered in this study.

7.6.7 Program Based Marginal Analysis (PBMA)

PBMA could perhaps be used at the program level across all three areas of care examined. In fact, one of the strengths of the PBMA approach is that it closely models how resources already are allocated at the program and regional levels. PBMA can be performed as part of a region's annual budgeting process. Requiring all requests for resources (both established and new requests) compete against each other and focusing the discussion on implications of marginal cases can increase efficiency. One of the shortcomings with PBMA is that it depends on defined evaluation criteria in order to evaluate different funding proposals. As with rational decision models, often defining these criteria requires deciding on one's preferred options beforehand, undercutting the use of the model (Lindblom, 1957). It is also unclear what training decision makers at the program level would need in PBMA before they could use this approach effectively. Still it may be possible to modify the PBMA to address some of these problems.

7.6.8 Accountability for Reasonableness

Daniels' *Accountability for Reasonableness* operationalizes key ethical considerations to help ensure a fair process for evaluation of health care resources. The rationale for why

particular allocation decisions were made should be widely communicated to all those concerned throughout the organization. A formal mechanism for appealing resource allocations should also be established. Both of these measures, along with a clear and open process, will likely help those whose requests for additional resources have been rejected, to better understand why resources were not directed to their area.

Accountability for Reasonableness is not applicable to all health resource allocations, in part because of the inherent lack of transparency with some levels of decision making (particularly at the political level). This approach is also not sufficient on its own to settle resource allocation questions which are in dispute, even after the proposed reasons are publicly available and challengeable. While Accountability for Reasonableness does offer a way to improve the ethical basis of some resource allocation decisions, the approach does not give sufficient guidance in a number of allocation decisions. Finally, this approach may be more effective in determining the region's overall budget, rather than at the program level, where there may be very few stakeholders interested in the allocation decision, many of who would already be involved in the decision making processes, e.g., endovascular coiling and prosthetics.

7.6.9 Public Engagement

In this project, no direct public engagement was sought with respect to resource allocation decisions in the three areas of care examined. Two of the regions have in the past engaged the public to help set priorities, primarily for a defined community or sub-regional level. These priority setting exercises did not seem to have a large effect on the

allocation of resources within either region. It is possible, however, that meaningful and effective public engagement could be incorporate into some program level decision making through the use of some type of deliberative process. A number of participants within each area of care said they would be open to some increased level of public involvement, if it was structured to reflect the public's concerns, rather than the concerns of a small group of people with vested interests in the outcome.

7.7 Summary Comment

This chapter discusses some of the key findings made throughout the project. Many of these findings show a disconnect between what is suggested in the resource allocation literature and what was reported by the key informants. Chapter Eight applies some of these findings to challenges relating to resource allocation identified by participants. The aim is to develop a set of recommendations which regional health authorities and other decision making organizations can use to improve resource allocation processes. For example, different aspects of three decision approaches identified above as possibly being applicable to the cases examined in this project are adopted to work within the current budgetary structure.

Chapter 8: Summary, Conclusions and Recommendations

8.1 Project Summary

This project aims to foster a better understanding of how health care resources are allocated across Canada. It does this primarily through an empirical examination of how resources are allocated within a number of health care organizations. Rather than focusing generally on the allocation processes within these organizations, the project concentrates on the resource allocation issues related to endovascular coiling, MRI, and powered upper arm prostheses in one health region within three selected provinces: Alberta, Newfoundland, and Saskatchewan. This approach allows the project 1) to follow allocation issues across various decision making levels within health care organizations, i.e., from initial frontline staff requests, through the program leadership's budget submission, to the regional health authority's executive team; 2) to follow allocation issues across decision making organizations, i.e., from regional health authorities to provincial Departments of Health; 3) to compare how resources are allocated across different health service areas; and 4) to identify regional / provincial differences in how health care resources are allocated.

In studying resource allocation across these different service areas and provinces, the project avoids initially using any of the proposed frameworks for improving resource allocation based on the view that it is important to first determine how allocation decisions are currently being made, what factors are usually driving these decisions, and what similarities and differences there are in the decision making processes across service areas and across various health care organizations, before applying frameworks founded

outside the health care area, e.g., in ethical theory or economics. In fact, by identifying current resource allocation issues for a number of service areas, the project is able to assess the likelihood that the approaches proposed for improving resource allocation would be useful across a range of real world resource allocation decisions.

The nine case studies were developed based on 43 key informant interviews and reviews of publicly available documents. Interviews were conducted between March 23rd, 2005 and March 16th, 2006 with a range of decision makers, from frontline physicians to senior officials within provincial Departments of Health.

Although the project avoids using any pre-existing framework, the case studies did require some focus in order to both limit their scope and allow for comparisons across the cases. Five factors often identified as important to resource allocation were examined across all the cases. The five elements focused on were need, use of evidence, cost, accountability and ethical considerations. By focusing on these elements, the project was able to provide sufficient structure to the case studies to allow for comparisons without biasing them towards only one area of concern.

8.1.1 Conclusions

Chapter Seven identifies 27 specific findings related to the case studies. In terms of the cases, it has been shown that resource allocation decisions regarding the same service can vary from region to region depending on existing staff capabilities, operational capacities and capital infrastructure, as well as where an organization is in the establishment of the

service. Some health care organizations are in a better position to develop new programs, although this initially better starting point cannot always be equated with a greater organizational commitment to establishing these programs. These differences in capabilities also influence which factors are considered in making resource allocation decisions. Across the service areas, resource allocation decisions vary in terms of their ability to get on the decision making agenda and who, in the end, decides on how resource are allocated in the area. In short, resource allocation is clearly affected by the institutional setting in which it is carried out and by the area of care the decision is about.

This project was motivated in part by the belief that not a lot is known about how health care resources are allocated and that these processes could be improved by clearly identifying the principles by which allocation decisions are made. In the introduction, Colleen Flood (2002) was quoted, claiming that resource allocation and coverage decisions in Canada "appear haphazard," based on either "non-existent or not transparent" principles. This project found that decision makers within the health care system did not share this view of allocation processes. In fact, the study found that decision makers are reasonably satisfied with the processes currently in place for allocating health care resources. While they may not be able to provide set formulas specifying how they allocate resources, decision makers are unanimous in their beliefs that a) concerns for what is best for the patient and b) the impact decisions have on their organization are the main factors driving most resource allocation decisions. Decision makers also feel that annual budgeting exercises do allow for a clear process for allocating resources, one

which many people within their organizations are familiar with and are comfortable using.

The basic structure of these allocation processes are fairly similar across each of the regions and provinces studied. Each level of decision makers, from frontline staff, the program leadership team, the region's executive team, the region's board, officials in the provincial Department of Health, the Minister of Health, Treasury Board officials, and the provincial cabinet, all have their own spending priorities. As resource allocation requests pass through the budgeting process, each level of decision maker has some influence on how health care resources will and will not be used. The sense of a lack of transparency and accountability reflected in Flood's comments perhaps reflect the various levels of decision makers who influence how resources are ultimately spent. Although the Minister of Health and the provincial cabinet have the ultimate say, decision makers at each level have some impact on which services will be funded. The fact that so many groups of decision makers all have some influence on the allocation process makes it difficult to determine who is actually making specific allocation decisions. Further complicating this situation is the fact, pointed out in Chapter 7 Section 4, that there is no decision making stability across this decision making structure, i.e., the person(s) or level which assumes decision making authority for a particular resource allocation decision can change depending on the circumstances surrounding the decision.

Another reason why resource allocation decisions appear "haphazard" or based on either "non-existent or not transparent" principles relates to how allocation priorities are set by

each level of decision maker. As has been recognized throughout this project, resource allocation decisions are complex, depending on the consideration of a number of factors, factors which are often unique to the specific allocation decision at hand. Rather than using a fixed formula, decision makers at each decision making level examine the overall case for different resource requests, consider the pros and cons, compare them with other requests, and decide what their funding priorities should be. The decision making process is thus very much akin to the way juries make decisions within the legal system. As with legal juries, it is often unclear to those who were not involved in the deliberations what factors led to a decision, even though those involved in the deliberation may feel there was a clear and legitimate process used. Thus while decision makers familiar with the budgeting process and who are involved in helping to set priorities generally feel comfortable with current allocation processes, for those outside the health care system (and even for many within the system), these processes can appear chaotic, politically driven and impenetrable. Part of the value of this project is that it presents how resource allocation is seen by those involved in making these difficult decisions.

8.1.2 Recommendations

In each of the three provinces, participants identified a number of challenges to improving health resource allocation. This section examines some of these challenges and recommends ways of addressing them based on the lessons learned throughout this project.

Hierarchical Decision Making Structure of the Health Care System

Many of the problems decision makers see with the current method of allocating health care resources relate to hierarchical decision making structure within the Canadian health care system. While all participants report that "*what is in the best interest of the patient*" is the main factor driving how they set priorities, decision makers at various decision making levels have dissimilar responsibilities and subsequently face different choices. What resource allocation decision ultimately best serves the interests of the patient is likely to be seen differently by a radiologist who performs the test, a physician who on a daily basis sees the wait times her patients face for a particular service, a regional executive member who has to balance a wide range of program requests or a Minister of Health who has to respond to requests from a number of health regions. Although everyone one says that their allocation choices are driven by the best interests of the patient, each decision maker interprets what is in the best interest of the patient from their own perspective within the decision making structure. Not recognizing the variation in the perspectives from which different decision makers make their allocation decisions often leads to cynicism as to why particular funding decisions were made.

Some of the other challenges relating to the hierarchical decision making structure include that there is no guarantee that higher decision points will respect, or even consider, priority setting work completed at other levels. As those closest to the patient, but also commonly the people with the least amount of decision making authority, frontline staff often feels left out of the process. This is perhaps not surprising given that frontline staff, to the extent that they are involved, are usually involved in the process in

the early fall and then do not usually hear whether their requests for resources are funded until after the provincial budget is announced in the spring. By being removed from the process for such a period of time, frontline staff often feel that their requests and the needs of their patients are not being taken seriously, which can negatively impact on staff morale. Another related problem is that requests from frontline departments are often developed by people with expertise in the area, but these requests are ultimately decided on by people who are likely not experts in that particular area. This raises the issue of how best to transfer knowledge across decision makers within the same organization.

R1. Establish a clear process for allocating resources within a health care organization, one which people are comfortable with.

R2. Keep requests for new resources within the process.

There is no easy way to overcome many of the problems associated with the multiple levels of decision makers and the amount of time the budgeting process takes. There appears to be little chance that the overall decision making structure of the Canadian health care system is going to change in the near future. Perhaps most fundamental to good resource allocation decision making is to establish a clear process, one with which all people in the organization are familiar. Although there are problems with the current budget approach, it is a process which many people within the health care system are familiar with and one which is likely to continue. Ensuring that requests for resources follow the budget process would be a positive step. Given the political nature of the

decision making structure, it is often easy for physicians and others working within the health care system to circumvent any priority setting or budgetary process by appealing directly to the Minister. This was especially seen to be the case in the two smaller provinces studied. It is important that these requests get evaluated along with other requests within the budget process. This can be achieved either by generating buy-in from frontline staff so that they do not try to circumvent the process or by encouraging higher level decision makers to reroute requests they receive directly back into the regular budgetary process. For example, in Newfoundland, the Department of Health now sends any resource requests they directly receive from physicians back to the regional authority to be considered as part of the regular budgeting process.

R3. Increase training on resource allocation decision making processes for decision makers at all levels, especially around the types of resource allocation decisions faced by different decision makers and the factors driving decisions at various levels.

R4. Develop a clear communication strategy with staff about the resource allocation process and allocation decisions.

R5. Before submitting the region's request for resources to the province, the regional executive should review its submission with the program leadership and interested frontline staff.

Accepting that the current structure of how health care resources are allocated is likely to remain intact, there are other actions decision makers can take to reduce some of the frustration and some of the disconnect within the process. Many of these actions aim to

keep staff more engaged in the overall process and allow for better communication across the decision making levels. First, increased education surrounding how health care resources are allocated across the different decision levels and how requests for new resources tie into the overall provincial budgeting process would be helpful. I was surprised by how many participants who are involved in determining funding priorities, especially at the frontline or program level, did not understand how their requests for resources were handled once they had been submitted to the person they directly report to within their organizations. In particular, different levels of decision makers were distrustful of the criteria other levels of decision makers use to evaluate funding requests. Through out the interviews, frontline staff complained that higher level decision makers never took evidence into account and that they made decisions based on political considerations, while some higher level decision makers felt that frontline staff believe that "there's an endless pot [of money]." Neither characterization reflects what the project found regarding the factors decision makers at either level use to base most of their allocation decisions. Beyond general education around how resources are allocated across the budgetary cycle, there should be more interaction between different levels of decision makers throughout the entire budgetary cycle.

One point where this could occur is before the regional executive submits their budget request to the provincial government. It may be useful at that point for the executive to meet with the program leadership of all the programs to explain what spending priorities have been decided on for the region and allow the programs one more chance to advocate for their priorities before the region submits its budget submission to the province. The

advantage of this meeting is that it shows the programs what requests are being put forward by the region across all of the programs, it lets the programs know which of their funding requests are being recommended to the province, it allows the programs one last chance to advocate for their requests, it allows the executive to explain why it has chosen to recommend the priorities it has, it provides another opportunity for engaging the program leadership teams further within the allocation process, and finally, it encourages further communication across decision making levels regarding resource requests. All of these benefits may lessen the disconnect and frustration some participants felt with current allocation processes.

Ensuring A Comprehensive Assessment of Resource Requests

Decision makers report being comfortable making resource allocation decisions. One of their concerns, however, is that they base their decisions on a comprehensive and realistic view of the impact of the service, especially for new services. What decision makers hope to avoid is committing to a new program only to find out that the program costs twice as much as originally expected, that the service is not as effective as it was initially presented or that the new program is unexpectedly impacting on other program areas. To help ensure these problems do not occur, frontline staff must present an honest and fair assessment of the pros and cons of their resource requests. This will require a level of staff buy-in so that they do not try to game the system to help ensure that their requests are funded.

In terms of ensuring a comprehensive assessment of requests, *Table 8.1* presents a template which the researcher has developed covering a number of the areas which requests for resources, especially for new services, should consider. The first section asks for a description of the problem the new service is meant to addressed, what the current treatment options are, what the new proposed treatment is and the advantages and disadvantages of the proposed treatment. The second section asks for a review of the evidence supporting the new procedure, including a review of the academic literature, the experience of other jurisdictions and the views of local experts. The third section suggests the likely patient population. The fourth section examines the cost and institutional impact of delivering the new treatment, including capital equipment costs, a review of any cost-effectiveness studies, operational costs, staffing requirements, training requirements, time required on existing equipment, any space issues, and any possible cost saving associated with the new treatment. The next sections ask about the likely impact on other departments, the ethical implications, and potential risks. The section on ethical implications follows the pilot project in Region B (Newfoundland), which asks regional programs to explicitly consider who is not being served by budgetary requests. The idea of the template is that it can either be formally implemented as a requirement for requests for new services or it can be communicated to the program leadership team as a guide of the type of information they should provide to allow for fair assessment of their funding requests.

Table 8.1 Template for Evaluating New Services

1.0 Introduction 1.1 The Problem to be Addressed 1.2 Current Options 1.3 Proposed New Service 1.4 Advantages and Disadvantages of the Proposed New Service **2.0 Overview of Existing Research** 2.1 Experience of Other Jurisdictions with the Procedure 2.2 Local Expert Opinion **3.0 Estimated Patient Population** **4.0 Budget and Organizational Considerations** 4.1 Capital Equipment Costs 4.2 Cost-effectiveness 4.3 Operational Costs 4.4 Staffing Requirements 4.5 Training Requirements 4.6 Time Required on Existing Equipment 4.7 Space 4.8 Possible off-setting cost savings **5. Likely Impact on Other Departments / Programs in the Region** **6. Ethical Implications** **7. Risks** **8. Other Issues**

In recommending use of this template, I am aware of the time and resources required to complete it. There are clear trade-offs in terms of the amount of management time required and the benefits which come from improved management processes. The template can be used as a guide that should be used to address particularly contentious or

costly allocation decisions, where a systematic review of the issues is undertaken. Given the amount of resources and management time this may require, it is likely that this could only be done for a few decisions a year. The template could also be used informally as a means of communicating with programs the type of information they should considering in determining their allocation requests, without expecting a written report outlining all of the different issues.

Towards a Process for Developing Resource Allocation Priorities

Initially this project aimed to recommend and develop a more structured approach for allocating health care resources. Although several participants said that there was some value in having more structured allocation processes, generally participants were doubtful about the applicability of any universal approach due to the variation in resource allocation requests; the various, and often unique, factors involved in different decisions; concern that establishing a new process does not ensure that that higher level decision maker will respect the decisions arrived at by the process, especially when the outcome of the process is unpopular; and the importance of institutional culture and existing decision making structures on how resources are allocated. In fact, some participants felt that maintaining their existing resource allocation process, in which most people in their organization are familiar, is more important than adopting an unfamiliar model which may align more closely with how the academic literature suggests health care resources should ideally be allocated.

R6. To the extent possible, communicate the rationale for allocation decisions to other decision makers.

R7. Ensure that requests for resources are considered together so as that requests compete for resources.

R8. Involve a team of people with a range of backgrounds in the allocation process.

Even though most participants felt a universal structured approach would not be beneficial, it is still possible to make some general recommendations about how resources could be allocated based on our evaluation of the eight proposed approaches for improving resource allocation. Following Daniels' Accountability for Reasonableness, there is an advantage to having a process that is as transparent as possible. Clearly reporting the rationale for various resource allocation decisions, especially contentious decisions, is likely to help lessen some of the disappointment of those whose requests for additional resources are denied. The rationale for why particular allocation decisions were made should be widely communicated to all those concerned throughout the organization. A mechanism for appealing resource allocations can also be established, perhaps as part of the following year's budgeting process or before the region submits its budget submission to the provincial Department of Health.

The program budgeting approach also offers some valuable assistance, in that it mirrors in many ways how several resource allocation requests are currently considered. Permitting more open and transparent competition among budgetary requests could improve priority

setting and increase efficiency within an institution. One of the shortcomings with PBMA is that it depends on defined criteria in order to evaluate different funding proposals. Rather than using defined criteria, the competition between programs can simply be a forum where the different programs make their case for additional resources in front of various decision makers and through discussions with the other programs seeking resources. The Medical Affairs Committee within most regional health authorities may be a good venue for this discussion. If consensus cannot be reached, the ultimate decision will have to be made by the executive team. But at least all the concerned parties within the organization will have been able to make the case for their request. Structuring the process in this way will also allow decision makers to see the opportunity cost of the requests they chose to fund. A more open approach in which program requests compete against other requests for resources and the rationale for decisions are communicated across the organization will provide a more comprehensive picture of the impact of allocation decisions, while allowing for a more efficient use of health care resources.

Finally, numerous participants felt that good resource allocation depends on the right people, with the right skills, being involved in the process. Because of the complicated nature of the problems faced no one person has all of the required knowledge. It is important than that teams or groups of decision makers be involved in making allocation decisions.

Ensuring a fair, ethical and accountable allocation processes

R9. Increase public reporting, activity budgeting, and the greater use of performance indicators to improve the accountability of allocation processes.

Decision makers were concerned with showing that their resource allocation processes were fair, ethical and accountable to the public. Some of the general trends in public governance have also positively affected the processes for allocating resources. For example, health regions are usually covered under any new government accountability legislation. There is a trend towards greater public reporting of both the financial and system performance of the health regions, as well as the greater use of business planning to publicly present what a region's future plans are. Activity budgeting and greater use of performance indicators also tie more closely the use of resources with system performance.

R10. Ensure a fair and ethical allocation process by mandating consideration of both the fairness of the allocation process and how health care resources are ultimately distributed.

In terms of evaluating the fairness of allocation exercises, although not applicable for all situations, Accountability for Reasonableness does offer a framework which has been used for evaluating the fairness of allocation process. While Accountability for Reasonableness can evaluate the fairness of process, the question of who is not getting served still needs to be addressed. Region B reported having a pilot project which

requires the program areas to consider the ethical implications of their budget requests, particular in terms of the services which are not being funded. Forcing programs to explicitly consider the opportunity costs of their resource requests is another way to help ensure that a region's distribution of resources is fair and ethical.

Public Engagement

The dilemma around public engagement was mentioned by a number of informants. Participants recognized that the public have a legitimate role and should be engaged in decisions around coverage and resource allocation. Yet the problem of concentrated interest, where only those directly affected by a decision become involved, was often identified.

R11. Decision makers need to be selective in what questions they engage the public about.

R12. Decision makers should aim for meaningful public engagement when involving the public in resource allocation decisions.

The Basket Grant research team examined how best to engage the public around resource allocation. It found that public engagement is not guaranteed to be successful and decision makers need to be selective in what questions they engage the public about. The aim of public engagement should be **meaningful** public involvement, in which the public are honestly informed of the reason for the engagement exercise, the level of decision

making authority which will be given to the exercise, and what will be asked of participants. Decision makers also need to consider the extent to which members of the public should be involved in determining the structure of the allocation process. The basket grant team has developed a framework which can help decision makers work through some of these difficult issues (Chafe, R., Neville, D., Rathwell, T., Deber, R., Kenny, N., Nestman, L., et. al., 2007).

8.2 Limitations

This project faced a number of limitations which may have affected its overall results. Some of these problems have already been identified in the methodology chapter, e.g., the breaking of the interview tape and differences in how participants in different provinces were identified and contacted. Another important limitation was the low level of participation from provincial Departments of Health. In Newfoundland and Alberta, attempts were made to invite the Minister of Health to participate in the project. Given the important role the Minister and the provincial cabinet have in the overall allocation of health care resources, they would have been able to provide a valuable perspective on how health care resources are allocated and could have brought more of a political perspective into the analysis. Unfortunately, in both provinces, the Minister declined the opportunity to participate. Given that the Minister did not participate in the first two provinces, it was decided to limit the project, from the provincial perspective, to officials within the Department of Health, for the third province as well.

Another limitation was the low participation rate amongst officials within the Departments of Health. Participation rates for provincial officials were substantially lower than other groups of participants. The overall participation rates for each province were Alberta (82%), Newfoundland (62.5%) and Saskatchewan (66.6%). For provincial officials, participation rates were Alberta (40%), Newfoundland (33.3%) and Saskatchewan (50%). Reasons for this variation in participation rates may include added time constraints on provincial officials, the number of research requests senior provincial officials receive (especially in Newfoundland, where senior officials were also surveyed for the larger Basket project), or the perceived lack of connection to resource allocation decisions in the three specific areas of care. Even though the provincial participation rates were low, interviews were conducted with at least two provincial officials in each province. Also, there is a large body of existing material on provincial decision making structures and the factors guiding resource allocations at the provincial in each province which this project was able to draw upon.

Another possible limitation for the project was the way cases were selected. While criteria were developed to ensuring some level of variability across the cases, in terms of choose an acute care, a diagnostic and a rehabilitative service, there was also some level of serendipity in how some of the cases were selected. Given that a wide number of areas of care and any of the ten provinces could have been chosen, choosing cases that had some advantage in terms of conducting the project seemed rational. It also does not appear that the choice of this set of cases were in anyway detrimental to the reliability of the project's results or to its ability to generalize results to other circumstances.

Another limitation is that the project focuses on resource allocation decision making only from the perspective of those involved in making these decisions. This focus excludes other relevant groups who could also have added their perspective on how healthcare resources are allocated, e.g., providers who have chosen not to be involved in allocating healthcare resources or groups outside of these decision making organizations who affected by the allocation of healthcare resources and who may want to be more involved in how resources are allocated. It is likely that such informants would have indicated less satisfaction with how healthcare resources are currently allocated.

Finally, I could not exhaustively probe all of the concepts which did arise during the interviews. It was not possible delve into every topic with the thoroughness I would have liked, given the time constraints associated with decision makers who had limited time for interviews and a research project which already aimed to cover a range of topic areas relating to resource allocation.

This project is exploratory, not exhaustive. Limiting the project in the way I did resulted in a manageable scope for the project. Several topics and perspectives not addressed in this study are important aspects of resource allocation which should be investigated through future research which could build upon the knowledge gain through this research project.

8.3 Knowledge Transfer Strategy

One of this project's aims is to effectively disseminate its results to interested audiences in order to increase the likelihood that its results will be used. There are a number of ways to increase the impact of a project's findings. One way is through a strategy called "linkage and exchange" (Lomas, 2000). Linkage and exchange is based on the idea that contact should be made between researchers and potential audiences of that research during the research process; and that there should be an exchange of information between these two groups throughout a research project, with the concerns of potential audiences helping to guide the research to more closely address 'real-world concerns' (Lomas, 2000). In fact, Lomas (1997) says that "early and ongoing involvement of relevant decision makers in the conceptualization and conduct of a study is the best predictor of its utilization" (p. 8).

This project has two main audiences. The first are decision makers. The second are health services researchers. Early contact was made with both groups. The project was discussed with decision makers in each province before data collection began. The project proposal was presented to a number of audiences of health services researchers to garner their feedback as early as the initial planning stages for the project. There were also discussions with a number of one-on-one discussions with health services researchers about the project. These discussions with decision makers and health services researchers continued throughout the project. The project's recommendations were presented to both audiences of health services researchers and decision makers before being finalized.

Another key for an effective knowledge transfer strategy is to have the proper conceptual model of how research is likely to be used. Black (2001) argues that researchers "need to acquire a more sophisticated understanding of the policy process" (p. 277) to improve the likelihood that their research will be used. Part of the problem is that researchers do not appreciate the number of inputs, e.g., pressure for interest groups, the various forms of evidence presented to policy makers, the institutional constraints, etc., which impact on policy decisions. Weiss (1979) describes this situation as the interactive model of research use. This model holds that research knowledge is one source of information among many which decision makers access in making a decision and that there is no formal method for evaluating these different sources of knowledge. The interactive model of research assumes that research has some influence, but that research findings are not usually decisive.

This research project fits well with the interactive model of research use. First, the project recognizes that there are numerous inputs in the decision making process. In fact, this recognition is one of the conceptual starting points of the study. It also recognizes that the factors impacting on each decision are sometimes unique. The project has tried to build a level of flexibility into its recommendations. This should increase the project's overall utility for decision makers.

Another problem often noted by researchers and decision makers regarding the use of research relates to the disconnect in the timelines of the two groups (Lomas, 1997). Decision makers often have to make a decision within short timelines, whereas research

on a topic often takes much longer to conduct. Given that the main focus of this project is to develop recommendations for allocating health care resources, the mismatch of timelines should not be a problem. Health care organizations will for the foreseeable future be faced with making resource allocation decisions. It is expected that recommendations in this area will be relevant for some time.

In terms of a dissemination strategy for this project, a summary of the main results of this project will be sent to all participants. These summarizes will be tailored to the different types of decision makers who participated, e.g., summaries for participants working in the area of powered upper armed prostheses will focus on lessons learned regarding the allocation of resources for powered upper armed prostheses. There will also be a number of academic articles arising out of this project. The results of this project have already been presented numerous times, including the *6th International Conference on Priorities in Health Care,* Toronto, Ontario (Chafe, Neville, Rathwell, Biden and Tomblin, 2006a), the *2006 Canadian Association for Health Services and Policy Research Conference,* Vancouver, British Columbia (Chafe, Neville, Rathwell, Biden and Tomblin, 2006b) and the *2007 National Healthcare Leadership Conference* Toronto, Ontario (Chafe, Neville, Rathwell, 2007).

8.4 Concluding Remarks

Improving how we allocate health care resources will not solve all the problems in our health care system. It will not allow public coverage to meet all the existing and prospective demands. Difficult choices will still have to be made by decision makers at

all levels. It is hoped, however, that better resource allocation decisions will lead to improve health outcomes, run our health care system more efficiently, and make the system more responsive to the wants and needs of the Canadian public. Achieving these goals will all contribute to the long term sustainability of our publicly funded health care system.

Health care resource allocation is a messy business. There are a number of different factors to consider and groups usually have completing interests for a limited pool of resources. Even with a good process for allocation of resources and experienced decision makers, sometimes wider economic and political factors will win out. Resource allocation will never be perfect. But improving resource allocation processes does offer the hope of a more efficient, ethical and accountable health care system. It is hoped that this project has increased our understanding of health resource allocation in a way which will lead to future improvements in how our health care resources are allocated.

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Appendix A: Health Care Decision Making in Canada

This appendix provides background information and an overview of decision making within the Canadian health care system in order to provide further context to the cases. It starts with an overview of health care decision making in Canada, including the importance of the courts and wider societal trends.

Health Care Decision Making in Canada

One of the more interesting aspects of health care decision making in Canada is the sometimes complex interaction between the federal government and the provinces. The *British North American Act* (1867) gave provincial governments primary constitutional authority to regulate in the area of health. Although the federal government does have authority in some areas, e.g., to provide health care to Native Canadians, members of the RCMP and the Canadian Armed Forces, as Lavis (2002) points out, the constitution makes provincial governments the ultimate decision makers in the Canadian health care system. In fact, the Canadian health care system is really a collection of independent, provincially and territorially run, health care systems.

In 1867, when authority for health care was granted to the provinces, public health care spending was fairly insignificant compared to other public spending priorities. Since then, the public cost of providing health care has greatly increased, both in absolute terms and as a proportion of total public spending. Over the last century, the increasing cost of health care, and its implications for access to care, has resulted in fundamental changes in how health care is funded across the industrialized world (Starr, 1982; Tuohy, 1999). Likewise, from the end of the Second War World to the beginning of the 1970s,

Canadians saw a great transformation in the financing of their health care system (Taylor, 1978; Tuohy, 1999). By the early 1970s, publicly financed and administrated insurance plans for hospital and physician services were established across the country. Although the provincial governments have the constitutional authority over increasingly expensive areas of social spending, like health care and education, the federal government have a much stronger position in terms of its ability to raise tax revenue. This mismatch in spending responsibilities and tax revenues creates a situation in which new health care initiatives are often dependent on the federal government being willing to transfer funds to the provinces to partially cover their cost. For example, public insurance plans for hospital and physician services would not have been established in most provinces without federal cost-sharing agreements (Taylor, 1978). Health care has thus become de facto an area of joint federal-provincial involvement.

Joint federal-provincial involvement in health care has resulted in numerous clashes between the two levels of government. Even the amount of money the federal government transfers to the provinces for health care is a constant source of disagreement (Deber, 2000). Part of the contention is the result of changes in how federal transfers are structured. The *Hospital Insurance and Diagnostic Services Act* (1957), which first offered cost sharing to the provinces for hospital services, and the *Medical Care Act* (1966), which covered physician services, both required the federal government to cover 50% of the cost of the services provided. In 1977, the federal government passed the *Established Programs Financing Act*. This Act replaced the 50% federal cost sharing arrangements with a combined block grant for health care and post-secondary education.

Included with this block grant was the transfer of income tax points from the federal government to the provinces. Essentially what the federal government did was to lower its income tax rate but this drop in federal taxes was matched by an equal increase in the provincial income tax rate, so that tax payers saw no difference in their overall tax bill, but more money flowed to the provincial governments. This combination of block grants for numerous areas of social policy and the transfer of tax points help create much of the disagreement over the true amount of federal funding directed to health care. As Rachlis (2005) points out, part of the confusion is that the federal government continues to view these tax points as part of its health transfer to the provinces. The provinces, on the other hand, do not count the tax points as part of federal transfers. What is clear is that following the move to block grants, the percentage of public health care spending paid by the federal government dropped significantly (Deber, 2000; Rachlis, 2005). As the federal government moved to balance its budgets during the mid-1990s, these transfers were cut even further. Although the cuts allowed the federal government to balance its budget, they also placed a great strain on provincial budgets and produced a good deal of tension in federal-provincial relations.

The last ten years have seen a new phase in federal-provincial funding arrangements regarding health. There have been increases in the level of federal funding to the provinces. In 2003, the federal government separated the federal transfer for health care from transfers for other social programs. The creation of the *Canada Health Transfer* is meant to improve the transparency of federal funding (Health Canada website, 2006). The federal government has also begun to increasingly use programs targeted at particular

areas of health care as a means of both increasing funding and directing how this new funding is spent. Examples of these targeted initiatives include the *Medical Equipment Fund* (2000 – 2003), *Canada Health Infostructure Partnerships Program* (2000-2003), *Knowledge Development Exchange Applied Research Initiative* (2001-2003), *Health Infostructure Support Program* (1998 - 2000), *Health Transition Fund* (1997-2001), *Diagnostic and Medical Equipment Fund* (2003 – 2004) and the *Primary Health Care Transition Fund* (2000-2006). In 2004, the federal government announced its *Wait Times Reduction Fund* (2004 – 2014). Stemming from the 2003 *First Ministers' Accord on Health Care Renewal*, this fund identifies five areas - cancer, cardiac, diagnostic imaging, joint replacement and sight restoration - in which the federal government is committed to making strategic investments over the next ten years in order to reduce wait times.

Although health care is constitutionally a provincial responsibility, the federal government retains a great deal of influence through the conditions it places on federal funding transfers. In 1984, the federal government passed the *Canada Health Act*, which combined and updated previous health legislation. In order for provinces to receive federal transfers, the *Canada Health Act* requires that all medically necessary hospital, physician and surgical-dental services provided to insured persons be covered under provincial plans. It requires that these provincial plans universally cover all residents of a province. Coverage has to be portable across provinces. Coverage also has to be comprehensive, public administered, and meet certain accessibility conditions. Essentially, the federal government bans any charges which may impede an insured person receiving medical care for an insured service. These five conditions are only

enforced, however, by the threat of either partial or total withholding funding transfers. If a provincial government wants to abandon the principles of the *Canada Health Act* and forego federal funding, there is little the federal government can do to prevent it.

Although the constitution allows provinces to act outside of the *Canada Health Act*, because of the financial and political consequences of abandoning the principles of the *Canada Health Act*, no province has yet chosen to openly defy to any great extent the conditions on federal cost sharing. Coyte (2004) points out that this leads to a cascading effect on decision making. Higher levels of governments make decisions which limit the options open to lower levels of governance, e.g., the decisions by provincial governments limit the actions of regional health authorities. Coyte identified the federal funding requirements set out in the *Canada Health Act* as constraining the options of all other institutions, including provincial governments.

While the *Canada Health Act* states that all medically necessary hospital and physician services must be publicly financed without any financial barriers to access, it does not specify what should be the scope of these services. However, the *Canada Health Act* is silent on many important areas of health care, e.g., home care, pharmaceuticals. Thus provinces have a good deal of discretion in determining which services to cover under their public health plans. This discretion can lead to wide variation in coverage across the country. With technological and pharmaceutical advances, differences in the financial capabilities between the provinces, the lack of national guidance, and the lack of strong

coordination amongst the provinces, it is likely that differences in coverage will continue to increase (Neville, 2005; Gregoire et. al., 2001).

Court Rulings

A recent, but important, influence on Canadian health resource allocations have been the courts. Canadian courts have generally left the design of social programs to the legislative branches of government. In 2002, the Supreme Court of Canada (Gosselin v. Quebec, 2002) ruled that the *Canadian Charter of Rights and Freedom* (1982) does not require the government to set up any particular social benefits. In other words, the federal and provincial governments are free to establish, or not establish, whatever social programs they see fit.

Once social programs are established, they are subject to constitutional protections. Clause 15 of the *Charter* guarantees "the equal protection and equal benefit of the law without discrimination." The Supreme Court has interpreted this condition to include that the government must remove any barriers which discriminate against people in terms of the ability to benefit from a social program once a program is established. In the Eldridge case (Eldridge v. British Columbia, 1997), the Supreme Court ruled that the province of British Columbia had to provide translation services to deaf patients in its health care institutions. In the opinion of the court, by not providing deaf translation services, the province was limiting the deaf patients' ability to benefit from an established social benefit and that this discrimination was based solely on their disability.

In 2004, the court considered the question of health resource allocation directly. The Auton case (Auton v. British Columbia, 2004) directly challenged a provincial government's ability to deny coverage for medical care. In this case, the families of four autistic children claimed the government of British Columbia's failure to cover Applied Behavioural Analysis and Intensive Behavioural Intervention violated their children's equality rights as guaranteed under clause 15 of the charter. Two lower British Columbia courts ruled that the treatment was 'medically necessary' and therefore should be covered under the provincial Medicare plan. While the government of British Columbia acknowledged the importance of early intervention for autistic children, they did not provide funding for Applied Behavioural Analysis / Intensive Behavioural Intervention for all autistic children. The government's decision was based on the emergent nature of the therapy, the costs ($60,000 annually / patient) and the needs of other people for limited medical resources.

In November 2004, the Supreme Court of Canada ruled against the families. The basis of the courts ruling was "the benefit claimed – funding for all medically required treatment – is not provided by law" (Auton v. British Columbia, 2004, section. 35). While the *Canada Health Act* does require provinces to provide medically necessary care, it does so only with reference to services provided by physicians or within hospitals. The *Canada Health Act* does not extend the concept of medically necessary care to care provided by allied health professionals, like those who provide Applied Behavioural Analysis / Intensive Behavioural Intervention services. The court also recognized that a provincial health insurance plan is "by its very terms, a partial health plan and its purpose is not to

meet all medical needs" (Auton v. British Columbia, 2004, preamble, p. 5). Limitations on which services are covered are an intended part of the public health care system. In deciding which services are publicly insured, the court ruled that charter violations only occur when discrimination can be shown in how provincial governments made their decision, but not in what it decides to cover. In other words, in making coverage decisions, there can be procedural violations of the Charter, but not substantive ones. The Auton case does show the court's increasing willingness to consider cases which directly effect how health care resources are allocated in this country and it is likely that similar cases will be brought before the court in the future.

Key Interest Groups

Numerous groups have a stake in either increasing or redirecting health care spending. These actors include health care providers, unions, health technology and pharmaceutical companies, and various disease-specific groups.

Physicians and physician groups, like the Canadian Medical Association and their provincial counterparts, have a great deal of influence in the health care system. This influence is both in the area of government policy and within health care institutions. With the introduction of public medical insurance, provincial governments allowed physicians to retain control over clinical decisions. Physicians also retained their central position in the delivery of care. It was these terms, along with fairly generous compensation, which helped win physician support for a public Medicare plan (Taylor, 1978; Hutchison, Ableson & Lavis, 2001). Because of the high regard the public hold

physicians, shortages of physicians in some areas and their high level of technical expertise in area of health, provincial governments are often reluctant to publicly challenge physicians. On particular issues, physicians may be divided along sub-disciplines. These divisions particularly occur in the areas of fee-scheduling and resource allocation (Archibald & Flood, 2004).

Hospital and regional health board associations (in nine of the ten provinces) are also important actors in health policy. These associations represent the interests of large institutional providers. Their influence is somewhat limited, however, by the fact that their members are often under the direct control of provincial governments and that large regions often interact directly with the provincial government.

Finally, there are a number of other groups from other professional associations, unions, organizations representing disease groups, pharmaceutical companies, etc., which also participate in the decision making process. Depending on the issue, their influence may be quite substantial. Usually their influence is confined to areas which are seen as being of direct concern to that particular group.

Other Political Factors

There are a number of other factors which impact on health care decision making in Canada. Many of these factors do not arise solely from the institutional structure of the Canadian health care system. To conclude this overview of the broader policy

environment, other influences on health care decision making in this country are discussed.

The Historical Stability of Resource Allocations

Daniels (1986) writes that one of the best aspects of a public health care system, like Canada's, is that it allows for a more rational distribution of health care resources. Although this may seem to be the case compared to the American system, almost always the historic distribution, i.e., how health care resources are currently distributed, trumps more rational distributions. For example, if a new effective Alzheimer's drug is developed, it is very unlikely that a province would say to a group of Cystic Fibrosis patients "you cannot have the medication we paid for last year because we have a new Alzheimer drug which is more cost-effective and will save the system money if we cover that instead." In fact, Hutchison, Abelson, and Lavis (2001) point out that the distribution of health care resources, both geographically and across types of services, in many cases still reflect distribution patterns which were in place before a public system was established in Canada.

Path dependence is the concept that describes the fact that once political institutions or programs have been established, they create conditions which support their continuation (Pierson, 2000). The physical equipment and infrastructure are in place. The public and users of the service have expectations that the service will be provided. Private companies, communities and employees come to depend on the work for their economic survival. While decisions about health allocation do affect everyone, people who

currently work in an area and those who are currently being served by it are more directly concerned and immediately affected by reallocations of resources. It is clear to these groups what is at risk in any reallocation of health care resources (Hurley, Lomas, & Bhatia, 1994). In many cases, it is less clear to those who are to benefit from reallocation what they stand to gain. This creates a situation in which those who currently benefit from the allocation of resources are usually much more motivated in opposing changes than those who will gain from those changes are to support them. As Machiavelli (1513/1992) famously said:

> "there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, then to take the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new" (p. 17).

Few want health care reform which would require giving up some of the benefits they currently have. The re-allocation of resources currently employed is not always easy. That physicians and other service providers have a great deal of influence over how resources are distributed also helps to maintain historical patterns of resource distribution. This historical pattern of allocations is one of the reasons why new services often have to wait for new money before they get funded.

Proportion of Public Spending and Health Care Inflation

Another factor which influences health care decision making is the level of spending already directed towards health care. In 2005, Canada spent $142 billion on health care (Canadian Institute for Health Information, 2005). This constitutes 10.4% of the

countries total GDP, which puts Canada in the top five countries globally in terms of per capita health care spending. While growth in health care expenditures has recently slowed, health care expenses are still increasing at around 6% annually. Roughly 40% of provincial government program expenditures are currently devoted to health care. The size of public expenditures on health means that health care spending decisions have significant consequences on other policy fields, budget deficits, and on the wider economy as well.

Public Support

While there is increasing concern about the state of the Canadian health care system (Blendon et al., 2002), the system still enjoys wide public support. Marmor (2002) finds that Canadians overwhelmingly support the underlying values of "public finance and equal access to health care, regardless of ability to pay" (p. iv). Graves (1998) finds a similar level of national consensus that the quality of health care services and equitable access to care are the two main values Canadians want embodied in their health care system. Ipsos Research (1998) has found that health care is the number one policy concern for Canadians. The public are strongly opposed to increased privatization of health care services (Commission on the Future of Health Care in Canada, 2002). A majority of Canadians also say they support more funding, even tax increases, to improve the quality of care (Ipsos Research, 2002).

Ipsos Research (2002a) also report Canadians overwhelming (88%) believe that increased taxes and limits on care can be avoided if health care resources were used more

efficiently. Graves (1998) also reports that most Canadians do not believe that health care rationing is necessary and that cuts can be avoided if waste was cut out of the system.

This strong public support for the health care system, and the public belief that rationing of care would not be necessary if the system was run more efficiently, are key elements of the decision making environment in regard to resource allocations. These factors also make decisions about the allocation of resources very political and subject to great public scrutiny.

Pervasiveness of Media Coverage

It should not be surprising, given all the factors listed above, that health care issues receive a great deal of media attention in Canada. Health issues receive perhaps more media coverage, on a constant basis, than any other public policy area. The vast range of health policy issues, from wait times for MRIs and the SARS crisis to diets and smoking bans, help assure that health policy remains on the public agenda. The range of interest groups affected by most allocation decisions ensures they also receive a good deal of media attention, especially in cases where a group of patients is denied care.

Global Political Climate and Privatization

Health care decision making is not an isolated sphere. It is subject to prevailing views about social policy more generally. Since the early 1970s, most industrialized countries have increasing accepted market-based reforms of their social programs (Micklethwait &

Wooldridge, 2004; Stanislaw & Yergin, 2002; Tuohy, 1999). This political shift is more pronounced in some countries than others. For example, summing up the current state of policy debates in the United States, David Brooks (2004) writes,

> "the fact is that over the next decade - whether we are talking about pensions, health care or even schools - the central argument is not going to be over whether to apply market competition to these problems. It's going to be over how to structure competition to produce the most dynamic results" (section A, page 19).

Although there are groups which do support increased private sector involvement in health care, or at least changing the incentive structures within the health care system (Gratzer, 1999; Shiell, 2002), the need for market-based health reforms is a less accepted view in Canada than in many other countries.

Appendix B: Provincial and Regional Data

Table A: Demographic, Economic and Health Care Spending Data by Province (2005)

	AB	NL	SK
Population	3,332,225	512,509	988,980
Quarterly % change in population	0.78%	-0.37%	-0.20%
Communities > 100,000	2	1	2
Communities > 1 Million	2	0	0
GDP (in billions)	$215.9	$21.5	$42.5
GDP per capita	$64,779	$42,017	$42,963
Average household income	$32,603	$24,165	$25,691
Unemployment rate	3.5%	14.8%	4.9%
Total health expenditures	$15.57 billion	$2.27 billion	$4.38 billion
Percentage change in total health expenditures	11.3%	4.8%	6.7%
Total health expenditure as % of GDP	7.7%	11.0%	10.3%
Total provincial government spending on health	$10.63 billion	$1.64 billion	$2.91 billion
Health as a percentage of total provincial program spending	37.9%	36.7%	37.2%
Percentage change in total provincial spending	12.2%	4.9%	6.2%
Per capita provincial government health care spending	$3297.74	$3183.65	$2920.92

Table B: Structure, Financial Data and Management Structure by Regions (2005)

	Region A (AB)	Region B (NL)	Region C (SK)
Number of health regions in the province	9 regional authorities + provincial boards for cancer care and mental health	4 regional authorities	12 regional authorities + a provincial board for cancer care
Region established	1995	2005	2002
Scope of regions	Acute care, long-term care, home care, health promotion and prevention activities	Acute care, long-term care, home care, health promotion, prevention activities, cancer care, rehabilitation and social services	Acute care, emergency services, long-term care, palliative care, home care, community health, mental health and rehabilitation services
Method of funding	Primarily formula-based, global budgeting. Targeted funding to certain regions for providing high-level care.	Primarily historical-based, global budgeting. Requests for additional funds made directly to DHCS.	Combination of global budgeting and targeted funding.
Total Revenue (Est.)	$2 billion (Region A)	$1.4 billion (All 4 NL Regions)	$600 Million (Region C)
Revenue per capita	$2400	$2000	$2200
Increase in operate costs (2006-2007)	6%	7.5%	10%
Management Structure	Regional programs and site-based	Regional programs	Regional programs, although retains some site-based governance

Appendix C: Information Needs for Cases

Information Required for Each Case Study

Area	Questions	Source of Question / Concept from Literature	Interview Question / Data Source
1. The Case Studies			
A. Current State of Usage / Coverage	a. What is the current level of coverage / access within the institution / the province?		1.1, 1.1a; 3.2
	b. What recent resource / coverage issues have there been?		1.1d; 2.2; 3.2a
	c. What conditions are there on coverage / access?		1.2; 2.10; 3.10
	d. How were these conditions set?		1.2a; 2.10a; 3.10a
	e. Why were these conditions set?		1.2b; 2.10b; 3.10b
	f. What is the cost of the program?		1.1c;
	g. How many people use the program annually?		1.1b;
	h. What trends are there in coverage / usage?		1.4;
	i. How is the program assessed?	Donabedian (1973)	1.1e;
	j. What future developments can be expected?		1.4a,1.4b;

Area	Questions	Source of Question / Concept from Literature	Interview Question/ Data Source
1. The Case Studies (cont.)			
B. Agenda Setting	a. How does the issue of coverage / increasing resources usually get on the institution's agenda?	Hacker (1997) reviews theories of political agenda setting.	1.5; 2.3, 2.3b; 3.3; 3.3b.
	b. Is there a formal process for requesting more resources?		1.5a; 2.3a; 3.3a.
	c. Who is the prime advocate for expanding coverage?		1.6; 2.4b; 3.4b.
	d. What other interested groups are there?	Brooks (2003)	1.7; 2.4; 3.4.
	e. Which outcomes are they trying to achieve?	Atkins (2005)	1.7a; 2.4a; 3.4a.

Area	Questions	Source of Question / Concept from Literature	Interview Question/ Data Source
1. The Case Studies (cont.)			
C. The Decision Making Process.	a. What is the decision making process?	Singer et al. (2000)	1.8, 1.9; 2.5; 2.6; 3.5; 3.6.
	b. Are services considered on an one-by-one basis, within programs or is there competition across programs?	Mitton (2003)	1.8a; 2.5a; 3.5a.
	c. Who is involved in the decision making process?	Deber (1995)	1.8b; 2.5b; 3.5b.
	d. What is their level of involvement / contribution?		1.8c, 1.8d; 2.2b; 2.5c; 3.5c.
	e. Who makes the final decision about coverage / increased resources?	Deber (1995)	1.9a; 2.6a; 3.6a/
	f. What decision tools are currently used?		1.10; 2.7; 3.7.
	g. Is there an appeal mechanism?	(Daniels 2000)	1.11; 2.8; 3.8.
	h. How does the decision making in this area compare with decision making in other areas of care?		1.12; 2.9; 3.9.
	i. How are vendors involved?		1.17; 2.16; 3.16.

Area	Questions	Source of Question / Concept from Literature	Interview Question/ Data Source
1. The Case Studies (cont.)			
D. Factors Impacting on the Decision	a. Which factors are considered in making allocation decisions?	Deber (1995); Hurley (2001) list factors commonly used in making allocation decision.	1.13; 2.12; 3.12.
	b. Which factors are unique to this area of care?		1.13a; 2.12a; 3.12a.
	d. Which factors reflect the strategic direction of the organization?		1.13b; 2.12b; 3.12b.
	e. Which factors have the biggest impact?	Deber (1995) reviews the level of influence of factors.	1.18; 2.27; 3.27.
	f. How are the competing factors balanced?		2.26; 3.27.

Area	Questions	Source of Question / Concept from Literature	Interview Question/ Data Source
1. The Case Studies (cont.)			
E. MRIs	a. Are there guidelines on MRI usage?		1.3; 2.11.
	b. If yes, what are they?		1.3a; 2.11a.
	c. How were they decided on?		1.3b; 2.11b.
	d. How are priorities set for scans?		1.3c; 2.11c.
	e. Is a cost-effectiveness analysis done?	(Weinstein 1987)	1.15e; 2.14g.
	f. If so, how is it calculated?		1.15f; 2.14h.
	g. What influence does the level of media coverage about MRIs have on coverage decisions?		2.19; 3.19.
F. Endovascular Coiling	a. Is the biplane angiography used for other procedures?		1.15c.
	b. If so, how does this effect the calculation of program costs?		1.15d; 2.14f.
G. Powered Upper Arm Prosthesis	a. What influence do the War Amps' programs have on coverage decisions?		1.7b; 2.4d; 3.4d.
	b. What influence does Workers' Compensation have on coverage decisions?	Ontario's Aids for Healthy Living Program.	1.7c; 2.4d; 3.4d.

Area	Questions	Source of Question / Concept from Literature	Interview Question/ Data Source
2. Factors in Public Policy Change			
A. Ideas	a. What influence does the wider public policy environment play in decision making?		2.17; 3.17.
	b. What role does public opinion play?		2.18; 3.18.
B. Institutions	a. How does the institutional structure of your organization effect decision making?		1.13b; 2.20; 3.20.
	b. Are there any provincial/federal initiatives relating to the area of care influencing the decision?	Diagnostic/ Medical Equipment Fund	2.21; 3.21.
C. Interests	a. Which groups have an interest in the coverage decision?		1.7; 2.4; 3.4.
	b. Which outcomes are they trying to achieve?	Atkins (2005)	1.7a; 2.4a; 3.4a.
	c. To what extent did competition amongst groups shape the decision?		2.18a; 3.18a.

Area	Questions	Source of Question / Concept from Literature	Interview Question/ Data Source
3. Variation in Cases			
	a. What effect does the area of coverage make?		Analysis of 3 b,c,d,e,f,g,h.
	b. What differences result from the groups advocating the change?		2.4c; 3.4c.
	c. What differences result from differences in the potential patient population?		2.13l; 3.13i.
	d. What differences result from differences in the potential impact on patients?		2.13k; 3.13k.
	e. What effect do differences in cost per case have?		Analysis of cases and questions 1.1c.
	f. What differences are there across provinces?		Comparison of interviews across provinces.
	g. To what extent does the institutional structure effect the decision?		Analysis of cases and questions 2.B.a,b,c.

Area	Questions	Source of Question / Concept from Literature	Interview Question/ Data Source
4. Specific Factors			
A. Need	a. How is the demand service determined?		1.16; 1.15a;
B. Effectiveness	a. What is considered in determining the effectiveness of the intervention?	Fuchs (1990) includes safety, efficacy, effectiveness, quality of life, patients' preferences, change in patient status.	1.14; 2.13; 3.13.
	b. What evidence of effectiveness is considered?	Kitson (1998) includes research, clinical expertise and patient preferences.	1.14a; 2.13a; 3.13a.
	c. Are outside technical assessments used?	Battista (1999)	1.14b; 2.13a; 3.13a.
	d. If so, which ones?		1.14b; 2.13c; 3.13c.
	e. Are experts advisory panels used?		1.14c; 2.13d; 3.13d.
	f. How is evidence assembled?	Cook and Sackett (1995)	1.14d; 2.13g; 3.13f.

Area	Questions	Source of Question / Concept from Literature	Interview Question/ Data Source
4. Specific Factors Cont.			
	g. How is the research reported to others involved in the decision making process?	Cook and Sackett (1995); Canadian Task Force on Preventive Health Care (2003); GRADE Working Group (2004)	1.14e; 2.13h; 3.13h.
	h. Are ever dispute evidence or criteria for evidence?	Atkins (2005)	2.13e; 3.13e.
	i. If so, how are disputes settled?		2.13f; 3.13f.
B. Efficiency / Cost effectiveness	a. How is cost calculated?		1.15; 2.14; 3.14.
	b. What is included in cost calculations?	Gold et al. (1976)	1.15a; 2.14a;
	c. How is possible patient population determined?		1.16a; 2.15a; 3.15a.
	d. Are cost comparisons made across treatments?		2.14d; 3.14a
	e. How are comparisons made across treatments?		2.14e; 3.14b.
	f. How are costs reported, e.g., case-by-case?		1.15b; 2.14c; 3.14c.

Area	Questions	Source of Question / Concept from Literature	Interview Question/ Data Source
4. Specific Factors Cont.			
C. Ethics	a. To what extent are values considered within the decision making process?		2.22; 3.22.
	b. Are any measures taken to ensure equitable access to services?	Ubel (2001)	2.23; 3.23.
D. Accountability	a. What opportunities are there for public input into the decision making process?		2.24; 3.24.
	b. What other ways are used to ensure the accountability of the decision making process?		2.25; 3.25.

Information	Questions	Source of Question	Source of Information
5. Decision Tools/ Best Practices			
A. Best Practices	a. What is the most difficult part of making these types of allocation decisions?		1.19; 2.28; 3.28.
	b. What best practices are there?		1.20; 2.29; 3.29.
	c. What improvements could be made in the decision making process?		1.21; 1.22; 2.30; 2.31; 3.20; 3.21.
	d. Which types of decision tools would be helpful in making allocation decisions?		1.23; 2.32; 3.32.
	e. Would the use of a score / balance sheet be useful?		2.32a; 3.32a.
	f. Would a standardized information form for making requests for increased resources be useful?		2.32b; 3.32b.
	g. Which categories should be included on such a form?		2.32c; 3.32c.
	h. Would improved practice guidelines be useful?		2.32d; 3.32d.

Appendix D: Example of Initial Interview Guides

Interview Guide 1: Department Head/ Program Manager/ Clinical Chief for Specific Treatment

Usage / Coverage

1. Briefly describe the program at your institution.

    1a. How many people use the program on annual basis?

    1b. What is the annual cost of the program?

2. What trends have you noticed in the demand for the program?

3. Are there any limits on coverage/usage, e.g., limited to certain populations, limited to certain conditions?

    3a. How were these limits set?

    3b. Are there guidelines on MRI scans? **(MRI only)**

    3c. How are priorities for scans set? **(MRI only)**

4. What is the current state of coverage / investment within your province in this area of care?

Agenda Setting

5. How do requests to increase resources / expand coverage in this area usually get on your institution's agenda? For example, are they initiated by staff? Users? Are there signs of increased need? Initiated by outside factors? Is there a formal process?

6. Who would you say is the prime advocate for increasing resources / expanding coverage in this area?

7. What other groups are involved?

    7a. What influence do the War Amps' and Workers' Compensation programs have on c overage decisions? **(Prostheses only)**

Decision Making Process

8. After the issue begins to be considered by your institution, what happens next? Describe the decision making process.

8a. Are decisions considered on a departmental/program basis? Considered individually on a case by case basis? Is there a competition across areas / interest groups?

9. How is the final decision made?

10. Who makes the final coverage decisions?

11. Is there any mechanism for appealing a decision?

12. What is your role into the decision process?

Factors

13. In deciding to increase resources / expanding coverage in this area, which factors are considered?

13a. Which of these factors do you feel are unique to this area of care?

13b. Which of these factors do you feel are unique to your institution?

13c. Which factors are dependent on other institutions, e.g., are there any federal government programs?

14. How is the effectiveness of the treatment determined? What information is considered?

14a. Are outside technical assessments used?

14b. Are outside experts / panels involved?

14c. Are vendors involved?

14d. Are there ever disputes about the evidence for effectiveness?

14e. How is evidence assembled and reported to others involved in the decision making process?

14f. What measures are used, e.g., number needed to treat?

15. What influence do the opinions of the local medical community about the treatment have on the decision making process?

16. What influence did the opinions of patients or the public about the treatment have on the decision making process?

17. How was cost of providing treatment determined?

17a. What is considered in costs? For example, space issues, training requirements, staff costs?

17b. Are costs considered in terms of 'cost per case' or in terms of overall program cost?

18. Are there any other resource considerations?

19. How is demand for the service determined?

19a. How is the potential patient population for the treatment determined?

20. Is there any attempt to measure the impact of allocation decisions?

21. Which factors have the greatest influence on the decision?

Recommendations/ Best Practices

22. Are there any best practices which you would recommend based on how your organization allocates resources in this area? What seems to work well?

23. What possible improvements in the decision making process would you suggest?

24. What specific recommendations would you make within this specific area of care?

25. What type of decision tools do you think would be helpful in making similar allocation decisions in the future?

26. Is there anything else you would like to add?

Thank you very much for your time and consideration.

Appendix E: Example of Revised Interview Guides

Interview Questions

- Briefly describe your role and responsibilities at ---.
- Describe the usual process for allocating resources within ---.
- In deciding to increase resources / expanding coverage for a program, which factors do you considered?
- What role does the provincial government play in the allocation of resources within ---?
- How are evidence and cost considered within the allocation process at ---?
- What measures / institutional features are used to ensure the accountability of the budgeting process?
- What opportunities are there for public input into the decision making process?
- What impact do ethical considerations have on the allocation process?
- What recent resource / coverage issues have there been for your organization in the areas of MRIs, Endovascular Coiling and Powered Upper Arm Prostheses?
- How would you say the process for allocating resources in these three areas of care compares with other areas of care at ---?
- Are there any best practices which you would recommend based on how your organization allocates resources?
- What possible improvements in the decision making process would you suggest?
- What type of decision aids do you think would be helpful to you in making resource allocation decisions in the future? E.g., heath technologies assessments, standardized forms for making requests for additional resources, balance sheets of harms/benefits, etc.

Thank you very much for your time and consideration.

Appendix F: Introduction Letter to Participants

[On Division of Community Health, Memorial University Letterhead]

[Date]

Dear Mr. or Mrs. ---,

I am writing to request your assistance with a research project examining how funding decisions for MRIs and endovascular coilings are made in our province. This is part of a larger research project, entitled **an Examination of Three Types of Health Care Resource Allocation Decisions,** which will look at how resource allocation decisions are made in the areas of MRIs, endovascular coilings and powered upper limb prosthesis in three provinces: Alberta, Newfoundland and Saskatchewan. The overall aim of the project is 1) to identify how these decisions are currently made and 2) to develop decision aids which can help decision makers make similar decisions in the future.

The project is being conducted by a researcher working in the Faculty of Medicine of Memorial University of Newfoundland as a part of his Ph.D. dissertation. A brief description of the study is attached. I would be glad to provide any additional information or answer any questions you might have about the project.

As a key person involved in decisions concerning MRIs and endovascular coilings within your organization, I am requesting an interview with you to find out more about how these decisions are made and to hear your suggestions on ways to improve the decision making process. The interview should take around one hour to complete. For your information, I have attached a list of the questionss I would like to discuss.

1/2

Confidentiality of responses and the identities of the people interviewed will be maintained at all time. No publications or presentations resulting from this project will identify you as a respondent. During the interview, you are free to refuse to answer any question you wish. This project has passed ethical reviews by Memorial University's Human Investigation Committee and the RPAC committee of the Health Care Corporation of St. John's. Before the interview, I will ask you to sign a consent form. A copy of this form is included in this package.

You can either contact me or I will contact you by phone on [Date] to hopefully arrange a convenient time for an interview. Thank you very much for your consideration and I hope that you will be willing to participate.

Sincerely,

Roger Chafe, B.A., M.A.
Rm 2849 - Department of Community Health
Faculty of Medicine
Health Sciences Centre
St. John's, NL A1B 3V6
Tel: 1-709-777-8722
E-Mail: rogerch@mun.ca

Thesis Supervisors:
Dr. Doreen Neville (Memorial University) 1-709-777-6215
Dr. Thomas Rathwell (Dalhousie University) 1-902-494-7097

Appendix G: Brief Project Description

Project Description

Managers of our health care system often face difficult choices about which services to cover under publicly funded insurance plans. They also face difficult choices about which services to provide within particular health care institutions. This study, called **An Examination of Three Types of Health Care Resource Allocation Decisions,** will examine particular resource allocation decisions to identify best practices and develop decision aids which can be employed in making similar decisions in the future. Using interviews and a review of the relevant documents, I will look at how decisions involving MRIs, endovascular coiling, and powered upper limb prostheses are made in three provinces: Alberta, Newfoundland, and Saskatchewan. The overall aim of the project is 1) to identify how these decisions are currently made, 2) compare how these decisions are getting made in the different areas of care and in the different provinces, and 3) to develop decision aids / identify best practices which can help decision makers make similar decisions in the future. My hypothesis is that taking a more case-focused approach will allow for the development of more relevant decision making aids than those currently being proposed in the academic literature. Once these decision aids have been developed and best practices identified, they will be piloted with decision makers to better ensure their applicability for future resource allocations decisions.

This project is being conducted as part of the requirements of Ph.D. program in Community Health at *Memorial University of Newfoundland and Labrador.*

My thesis supervisors are:

Dr. Doreen Neville	(Memorial University)	1-709-777-6215
Dr. Thomas Rathwell	(Dalhousie University)	1-902-494-7097

Appendix H: Consent Form – Alberta

INFORMATION SHEET

Title of Research Study **An Examination of Three Types of Health Care Resource Allocation Decisions**

Principal Investigator(s):

Co-Investigator(s): Roger Chafe (Ph. D. Candidate - Memorial University)

Background: As a key person involved in making resource allocation decisions regarding [MRIs, endovascular coilings, and/or powered upper limb prostheses] within your organization, I am requesting an interview with you to find out more about how these decisions are made and to hear your suggestions on ways to improve the decision making process.

Purpose: This request for an interview is part of a larger research project, entitled **an Examination of Three Types of Health Care Resource Allocation Decisions,** which will look at how resource allocation decisions are made in three areas of care - MRIs, endovascular coilings, and powered upper limb prostheses - in three provinces: Newfoundland, Ontario, and Alberta. The overall aim of the project is 1) to identify how these decisions are currently made and 2) to develop decision tools which can help decision makers make similar decisions in the future. This study is being conducted as a part of Roger Chafe's Ph.D. dissertation.

Procedures: The interview should take around one hour to complete. For your information, I have attached a list of the areas I would like to discuss. The interview will be carried out in a location suitable to you or over the telephone.

Possible Benefits: This project aims to develop tools and the identification of best practices which may be directly applicable to you when making future resource allocation decisions.

Possible Risks: None foreseen.

Confidentiality: Personal records relating to this study will be kept confidential. However, in addition to the investigators, the Health Research Ethics Board may have access to your records in special circumstances. Any report published as a result of this study will not identify you by name.

(Abbreviated) Title of Research Project: **An Examination of Three Types of Health Care Resource Allocation Decisions**

Voluntary Participation: You participation in this study is total voluntary. You are free to withdraw from the study, or stop the interview, at any time without having to give any reasons. You can refuse to answer any particular question at any time during the interview.

Reimbursement of Expenses: None.

Compensation for Injury: If you become ill or injured as a result of participating in this study, necessary medical treatment will be available at no additional cost to you. By signing this consent form you are not releasing the investigator(s), institution(s) and/or sponsor(s) from their legal and professional responsibilities.

Contact Names and Telephone Numbers:

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

Roger Chafe (Ph.D. Candidate) 1-709-777-8722
rogerch@mun.ca

Dr. Doreen Neville (Ph. D. Supervisor - Memorial University) 1-709-777-6215

CONSENT FORM

Part 1 (to be completed by the Principal Investigator):

Title of Project: An Examination of Three Types of Health Care Resource Allocation Decisions

Principal Investigator(s):

Co-Investigator(s): Roger ChafeContact Names: Roger Chafe Phone Number(s): 1-709-777-8722

Part 2 (to be completed by the research subject):

	Yes	No
Do you understand that you have been asked to be in a research study?	☐	☐
Have you read and received a copy of the attached Information Sheet?	☐	☐
Do you understand the benefits and risks involved in taking part in this research study?	☐	☐
Have you had an opportunity to ask questions and discuss this study?	☐	☐
Do you understand that you are free to withdraw from the study at any time, without having to give a reason and without affecting your future medical care?	☐	☐
Has the issue of confidentiality been explained to you?	☐	☐

Who explained this study to you?

_____

I agree to take part in this study: YES ☐ NO ☐

Signature of Research Subject

_____

(Printed Name)

_____

Date:_____

Signature of Investigator or Designee _____

Date _____

Appendix I: Consent Form - Newfoundland

Consent Form

I understand that I have been asked to be interviewed as part of a research project entitled: **An Examination of Three Types of Health Care Resource Allocation Decisions.** This project is examining how coverage/resource allocation decisions are made in the areas of MRIs, endovascular coiling (a treatment for brain aneurysms), and powered upper limb prosthetics. The interview should approximately take one hour to complete.

I acknowledge that I have read the Project Description of the **An Examination of Three Types of Health Care Resource Allocation Decisions** project and any questions and/or concerns about any aspect of the project have been answered to my satisfaction.

I have agreed that: Our interview be tape recorded. ____

OR Notes be taken of our interview._____

Only the primary researcher will have access to the interview notes, recordings or transcripts of interviews. All notes will be kept confidential and will be stored in a locked file cabinet in the Department of Community Health, Faculty of Medicine, Memorial University. Computer files will be stored in a password protected file in a locked room with limited access also in the Department of Community Health, Faculty of Medicine, Memorial University.

I understand that my answers to the interview questions will be kept anonymous and only used for the purposes of this research project. I understand that publications and presentations are likely to arise from this research, but that no information will be released that would disclose my personal identity without my express consent unless that information is already in the public domain, e.g., as a part of media reports.

I understand that I can obtain additional information at any time concerning any part of the project from the primary researcher, Roger Chafe, at 1-709-777-8722; or his thesis supervisors, Dr. Doreen Neville (Memorial University) at 1-709-777-6215 and Dr. Thomas Rathwell (Dalhousie University) at 1-902-494-7097.

I understand that my involvement in this research project is completely voluntary and I have the right to refuse to answer any questions and to end the interview at any time.

I hereby voluntarily consent to participate in this research project.

Name: _____

Name of Organization: _____

Signature: _____ Date: _____

Appendix J: Consent Form - Saskatchewan

CONSENT FORM

You are invited to participate in a study entitled **An Examination of Three Types of Health Care Resource Allocation Decisions**. Please read this form carefully and feel free to ask any questions you might have.

Researcher(s): This project is being conducted by **Roger Chafe**, Ph. D. Candidate, Department of Community Health and Humanities, Memorial University of Newfoundland. His contact number is 1-709-777-8722.

His thesis supervisor is, **Dr. Doreen Neville**, Department of Community Health and Humanities, Memorial University of Newfoundland. Her contact number is 1-709-777-6215.

Purpose and Procedure: This project is being conducted as part of a Ph.D. dissertation, which is focused on health care resource allocations. Using interviews and a review of relevant documents, this project aims to better understand how resource allocation decisions are made in three particular areas of care (endovascular coiling, MRIs and powered upper arm prostheses) in three provinces (Alberta, Newfoundland and Saskatchewan). You are being asked to be interviewed to give your insight into how these decisions get made in your province. Interviews should take about one hour to complete.

Potential Risks and Benefits: This project aims to improve our understanding of how resource allocation decisions get made across different areas of care, in different provinces. It will also hopefully identify any decision aids and/or best practices for allocating resources. The risks to participants are minimal. Safeguards are in place to ensure confidentiality. Questions are provided in advance and participants are able to refuse to answer any questions they wish or to end the interview at anytime.

Storage of Data: Interview data will be stored in a locked filing cabinet or on a password protected computer, both in a locked office in the Department of Community Health and Humanities, Memorial University of Newfoundland. The data will be under the protection of Roger Chafe. This data will be maintained in a secure location for five years after the completion of the study in accordance with the regulations of the University of Saskatchewan.

Confidentiality: The results of this study will be published and presented at conferences; however, your identity will be kept confidential. Any direct quotations used from this interview will identified only as a "respondent" and avoid all identifying information, such as your position. Given that there is still the possibility that persons could be identified by their quotations, the researcher will confirm with interviewees their willingness to have direct quotes included in published works prior to publication.

Right to Withdraw: Your participation in this study is wholly voluntary, and you may withdraw from the study for any reason, at any time, without penalty of any sort. If you withdraw from the study at any time, any data that you have contributed will be destroyed at your request.

Questions: If you have any questions concerning the study, please feel free to ask at any point; you are also free to contact the researchers at the numbers provided above if you have questions at a later time. This study has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board on (insert date). Any questions regarding your rights as a participant may be addressed to that committee through the Ethics Office (966-2084). Out of town participants may call collect. A summary of the results of this study will be sent to all participants.

Consent to Participate: "I have read and understood the description provided above; I have been provided with an opportunity to ask questions and my questions have been answered satisfactorily. I consent to participate in the study described above, understanding that I may withdraw this consent at any time. A copy of this consent form has been given to me for my records."

_____ _____

(Name of Participant) (Date)

_____ _____

(Signature of Participant) (Signature of Researcher)

Appendix K: Ethical Approval

Memorial
University of Newfoundland

Human Investigation Committee
Research and Graduate Studies
Faculty of Medicine
The Health Sciences Centre

November 15, 2006

Reference #04.233

Mr. Roger Chafe
Room 2849
Department of Community Health
Health Science Centre

Dear Mr. Chafe:

RE: **"An examination of three types of Health Care Resource allocation decisions"**

At the meeting held on November 9, 2006, the Human Investigation Committee reviewed the completed annual update form and granted full board approval until **December 9, 2007.**

Please be advised that the Human Investigation Committee currently operates according to the Good Clinical Practice Guidelines, the Tri-Council Policy Statement and applicable laws and regulations. The membership of this research ethics board complies with the membership requirements for research ethics boards defined in Division 5 of the Food and Drug Regulations.

Sincerely,

John D. Hanfett, MD, FRCPC
Co-Chair
Human Investigation Committee

Richard S. Neuman, PhD
Co-Chair
Human Investigation Committee

/HIC/SN

c: Dr. C. Loomis, Vice-President (Research), MUN
Mr. W. Miller, Director of Planning & Research, HCCSI