THE MEETING OF THE TWAIN:
MANAGING HEALTH CARE CAPITAL,
CAPACITY AND COSTS IN CANADA

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HPRU 91:4D JUNE 1991

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May 1991

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An earlier version of this paper was presented at the Institute of Medicine, Committee on Technological Innovation in Medicine's Conference on "The Changing Health Care Economy: Impact on Physicians, Patients, and Innovators", Washington, D.C., April 18, 1991
Introduction

The Canadian and American health care systems differ in three fundamental structural respects: entitlement, management, and environment. Fundamental philosophical differences in the two societies have their outcomes in the different approaches to, and results of, extending entitlement to benefits to their respective populations. The most obvious result distinguishing the two systems, is that 30-40 million Americans have no health insurance coverage, and many millions more have inadequate coverage. The managerial differences reveal themselves in the quite different 'targets' of management. In Canada the targets have largely been 'macro' or system-wide; in the United States they have been 'micro', in the form of particular clinical interventions, or 'mini', in the form of specific organizational and financial constructs (e.g. Health Maintenance Organizations) intended to manage care patterns for particular subsets of the population. The environmental differences are found in other sectors of the respective economies, the interests of which must be balanced against the activities of and benefits from health care. In particular, Canada does not have a major industry developing and applying new technologies to health care. Nor, since private employer-based health insurance is vestigial in Canada, is there an informed and articulate private constituency for cost containment.

While these differences have resulted in dramatically different cost experiences [1,2], and some clear differences in patterns of health care utilization, we argue in the present paper that the problems of health care system management in both countries are now, and will increasingly become, tied to the management of health care capital: human (particularly physicians), physical (facilities and equipment), and technological (know-how). Such management will require considerable political will on both sides of the border. To date Canada has been somewhat more successful, largely because of the very different funding process, but also because those responsible for making major capital decisions are less hampered by competing priorities.

We begin by elaborating briefly on the fundamental differences noted above between the two systems. We then outline Canada's approach to health care system management, the relationship of such management to the management of each type of health care capital, and the inter-connected nature of the three classes of capital. The paper closes with our observations on where health care system management strategy is likely to go in Canada, on the challenges ahead, and on the significance of some of those challenges for American health care system reform.

What Makes Canadian Health Care Different?

One of the great ironies in the predicament in which health care in the United States finds itself today is that a key to health care system management (and cost control) in Canada and most other western industrialized countries -- universal coverage or entitlement to benefits -- is seen in the United States as an elusive target because of its alleged cost expanding implications. Experience elsewhere continues to suggest that overall (as distinct from public) health care cost control in the absence of some form of universality is impossible. Yet universality, while apparently widely supported by Americans [3], remains elusive because of the perception that getting there will further increase costs.
in what is already the world's most expensive health care system. Such cost increases, in contrast to the broadening of coverage, find favour with only a very narrow and clearly identified group of Americans - the 'vendors' of services.

The reconciliation of this apparent contradiction is relatively straightforward. Universal coverage for medically necessary services is necessary, but not sufficient, for health care cost control. Extending coverage may increase costs in the United States if it is achieved through 'fill-in' coverage, that is through the addition of more pieces to the jigsaw puzzle of American health care financing. Hospitals operating at relatively low levels of occupancy may be able to get those rates up. But, as Wennberg has pointed out (this volume), where capacity is already relatively fully deployed (as is presumably the case for physician services), the extension of coverage may have minimal effects on overall use. It may, however, have significant upward pressure on prices. So those in the United States who are concerned about the cost-expanding implications of extending coverage may well be right. But they will be right only because the religious fervor with which 'autonomy', 'pluralism' and 'taxation anti-bodies' are employed to suppress more comprehensive proposals for health care system reform, has so far succeeded in restricting the policy choices to continued "disjointed incrementalism" [6].

Within this policy straitjacket, extending coverage to those Americans presently un- or under-insured, would achieve universality but would almost certainly increase health care costs in the United States quite dramatically. Universality is not sufficient to achieve cost control. While those countries with universal coverage have managed to control their health care costs relative to the experience in the United States, it has not been the universality per se that has achieved the cost control. One could quite easily imagine circumstances in Canada in which the entire population would be covered for medically necessary medical and hospital care, yet which would produce a cost experience more closely paralleling that in the United States. In fact, over sub-periods of the two decades of universal hospital and medical coverage, some individual provinces have done rather well at mimicking the American cost experience [9,10].

Yet universality elsewhere has left American health care costs in a league of their own [7,8]. In what sense is it necessary? In addition to

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1. This was in fact precisely what was found when universal health insurance was introduced in Quebec in 1970 [4]. While the distribution of beneficiaries changed - use by lower income persons increased, and higher income decreased - overall use was unchanged.

2. Thus, for example, we find the Health Insurance Association of America going to great pains to highlight the huge tax burden for Americans implied by the adoption of a Canadian-style system. Malignant neglect of the countervailing side of the ledger, the private out-of-pocket costs and private insurance premiums that would be 'saved' (but some of which represent the incomes of members of that Association), creates a predictable and highly misleading picture. [5]
being an objective worth pursuing in its own right for reasons of equity and altruism, universality is also a means to a management end. It appears to be necessary to the achievement of cost control because it provides the enabling management structure for such control. Cost experiences in different countries, or different provinces, states or regions, reflect the extent to which those responsible for managing the health care systems avail themselves of the management opportunities provided by each particular form of universal coverage. And that, in turn, depends on the shifting balance of political influence between vendors and payors.

In Canada, the federal legislation that established the hospital and medical care insurance programs provided grant and tax point transfers to the provinces that were conditional on universality and the establishment of provincial, non-profit, publicly administered, insurance programs to provide coverage for medical and hospital costs. Responsibility for plan management rests with each province. But the broad terms and conditions have been, at least until now, largely dictated by federal fiscal powers.

Thus in the Canadian context it is the manner in which universality evolved that has shaped the form of health care management. Unlike the United Kingdom, Canada chose to establish a collection of social insurance programs, while leaving the actual provision of care largely in the hands of private 'autonomous' medical practitioners. While most hospitals are public institutions and are funded globally out of public funds, the clinical management of the patients treated therein is a matter left to private practitioners with privileges at each hospital, and the administration of each institution is handled by an executive staff employed by independent hospital boards.

This does not mean, however, that care is not 'managed'. Health care in Canada is 'macro-managed'. Provinces manage the financing of the system which provides the care, and that financial management does affect the volume and mix of care provided. But the management, at least to date, has been one step removed from the bed-side or the clinician's office. 'Managed care', even in a broad sense, has come to be associated with a particular set of activities which have gained favour recently in the United States (chart review, outcomes management, the development and application of clinical practice guidelines, volume performance standards, second opinion programs, and the like). All of these have the explicit intent of involving more than the attending physician in the 'micro-management' of patterns of care provided to individual patients. These forms of 'managed care' are very explicitly about changing the fundamental nature of the 'doctor-patient' relationship. But these are not the only means of managing care.

The importance of viewing the two systems as occupying different positions along a management continuum cannot be overstated. Too often the debate over system reform in the United States casts Canada as the
system that 'ration'4, in contrast to the United States, where care is "managed". Such a contrast is, of course, pure rhetorical nonsense. Both (all) systems 'ration' [11]. But they come at it in quite different ways. Each system chooses to manage the utilization of health care resources in a different manner. The increasingly dominant American approach is to have third parties involved in the physician's micro-environment, to have someone attempt to look over the physician's shoulder and push her elbow. The Canadian approach has been to attempt to constrain the macro-environment, the total size of the health care pie, and to assign (implicitly) the responsibility for micro-management to those eating it.

In Canada, at least until quite recently, the micro-management levers have been left largely untouched. There is nothing in principle preventing such activity in the Canadian system, although in practice there are powerful political constraints. Certain approaches, however, such as the development of quality assurance programs and physician peer assessment programs [12] appear to be quickly emerging as a new growth industry in Canadian health care. But, as we suggest below, they seem to come with more circumscribed, realistic, objectives than in the United States, where 'managed care' appears increasingly (at least to us) to be expected to carry the burden of system cost control along with the more micro objectives of improving the effectiveness and efficiency of clinical management of particular health problems. On the record to date, its achievements at either level seem underwhelming.

The third fundamental structural difference between Canadian and American health care is to be found in the environmental context in which each system operates. A significant and economically important share of American productive activity (and capacity) is to be found in technological research, development, sales and distribution. Much of this (e.g. the development and marketing of new pharmaceutical products, imaging and laser technologies, orthotics and prostheses) has the American health care system as one of its major potential markets. More use of its products by the health care system means a more profitable technology sector (not to mention a more prosperous group of health care providers). Thus the dynamic of growth in the health care sector is intertwined with that of these other 'derived demand' sectors. But in the current environment the two sectors create competing political imperatives, and the political problems this fundamental conflict poses are characteristics of the American system that are largely absent in the Canadian.5

In this context it is worth noting that if the newly developed technologies were cost-saving on application in the health care sector, part of the political problem of competing priorities (health care cost

5 The military analogy is pervasive here. Not only do some of the technological advances in health care emerge from research that is, in the first instance, militarily motivated, but the military and the health care sectors in the United States share a common current political 'problem'. Both are under intense 'cost control' pressure, which conflicts head-on with the complementary technology development sectors for which the military on the one hand, and the health care sector on the other, are the major markets.

4 A leading example of this was the 1989 letter sent over the signature of Alan Nelson, then President of the American Medical Association (AMA), to all AMA members, cautioning that a "Canadian-style health care system could cause rationing of medical services."
control vs. support for technological research and development) would disappear. But the cost savings on one side of the ledger are still income losses on the other; the incentives for the health care system to pick up such technologies are not obvious. It comes as no surprise, then, that the health care industry has a voracious but selective appetite; cost-enhancing technologies are preferred.

But this latter point is no less true in Canada than the United States. The difference is that Canadian politicians do not have to confront these conflicting political objectives to anywhere near the same extent. The development of new pharmaceuticals, medical devices and the like in Canada represents a minute industry when set against the health care complex. Political initiatives to control health care costs in Canada do not run up against the same need to bear and nurture another major set of economic activities. The world of technological innovation in medicine will carry on (and in all likelihood continue to prosper) regardless of what Canada does in the way of health care management, and the future of the technological development sector in Canada is tied more closely to world markets than to the Canadian health care system.

6 Canadian policy may, however, be powerfully influenced by the priorities of the American technology industries. The Canadian federal government’s Bill C-22, passed in 1987, significantly extended the patent protection of new pharmaceuticals and thereby undercut (probably destroyed) nearly two decades of carefully crafted cost-control policy at the federal and provincial levels. It was a direct response to American pressure applied at the highest political level.

This may raise questions about the extent to which Canada’s relative cost control success is simply due to the absence of an industrial complex selling to the health care industry. Here the experience of other countries may inform the discussion. The United Kingdom falls somewhere between Canada and the United States in this respect. It has a major international pharmaceutical product presence, which runs hard up against the interest of the National Health Service in minimizing the cost of pharmaceuticals, at least for Britons. The pharmaceutical manufacturing sector appears to survive and prosper, while health care there represents significantly less of all productive activity than in Canada. Germany is closer to the United States than Canada in this respect, having major pharmaceutical, imaging and other ‘high tech’ interests, yet its health care cost experience is closer to that of Canada. A rational strategy for all these countries is to promote the export side of the domestic technological industries (especially exports to the U.S.) while attempting to limit their applications in domestic health care markets. But in the United States, the domestic health care system represents the largest potential market for the new products. Furthermore, it is a market eager to adopt new innovations in ‘half-way’ technologies. [13]

Thus the United States continues to promote progress in health care technology, apparently oblivious to the fact that such promotion is at odds with the rhetoric of health care cost control. This was nowhere more obvious than at the 1990 International Summit on Health Care and the Economy, sponsored by the University of Texas Health Science Centre just prior to the meeting of the G7 in Houston. The keynote speakers, Robert
Mossbacher and Denton Cooley, both gave inspirational addresses. Unfortunately the two fundamental messages could not have been more in conflict. The Secretary of Commerce opened the summit by emphasizing the need to extend coverage and improve the efficiency with which health care is provided to Americans. He emphasized that uncontrolled health care costs were now a serious drag on American prosperity and economic growth. Dr. Cooley celebrated the glories of modern medicine, and also expounded on the economic virtues of the export potential of the products and services developed and offered by the Texas medical complex (the largest such complex in the country), as a major counter-cyclical stabilizer in the Houston economy. Unfortunately neither speaker heard the other (nor, we suspect, would it have mattered if they had).

So HOW DOES Canada Do It?

1. Managing Operations

A considerable literature describing the organization and financing of Canadian health care already exists [see e.g. 13-18]. The fundamental characteristics are well known and any comprehensive attempt at description would detract from the intent of the present paper. In brief outline, each province has its own medical and hospital insurance program, but all adhere to requirements set out in federal legislation. A fundamental characteristic of these programs is that coverage must be offered to the entire population, under uniform terms and conditions. While a few provinces continue to charge premiums for medical care (in British Columbia, for example, premium revenue represented slightly more than 50% of total Medical Services Plan outlays (including the costs of administering the plan) during fiscal 1988-89), care cannot be denied because of premium payments in arrears.

The medical and hospital sectors are financed almost entirely from general revenues (from provincial sources and federal transfers to the provinces). In fact with the enactment in 1984 of the Canada Health Act, 'user charges', 'extra-billing' and other out-of-pocket medical or hospital costs to patients were largely eliminated because the legislation stipulates dollar-for-dollar reductions in federal transfers against any such private charges. In effect, then, a province allowing such charges ends up asking its population to pay twice, a compelling political deterrent. Not surprisingly, taxation rates are high. On the other hand, private insurance cannot operate in competition with the public medical and hospital programs. With very few exceptions Canadians do not pay out-of-pocket charges or premiums for these services. Since total health care costs are lower, the savings in private costs outweigh the extra tax payments.

Provincial governments are responsible for the allocative decisions within the health care sector in each province, and have a key role to play in the 'pricing' of services. Here we restrict our attention to medical and hospital care. Most physicians in each province are paid fees-for-service on the basis of a province-wide fee schedule. Overall 'average' changes in the schedule are periodically negotiated between provincial Ministries of Health and provincial medical associations (there are separate general practitioner and specialist associations in Quebec).
The medical associations determine the internal allocation of these increments. Each fee schedule is associated with a set of payment rules that govern the frequency and circumstances under which particular items billed will be reimbursed. Under increasing internal pressure, a number of provincial medical associations have recently begun developing relative value scales that would remove some of the alleged inequities, but there is no sign of any movement toward a consistent national relative value scale. While fee experiences in different provinces and different periods have varied, sometimes dramatically [9,10], overall the process of bilateral negotiations has held fee increases at, or slightly below, general rates of inflation over the past decade. This process represents a key component of managing the Canadian health care system, and it has implications for the management of care (as distinct from costs) [17].

Physician fees have grown much more rapidly in the United States than in Canada; utilization per capita has grown somewhat more rapidly in Canada. An increasing number of physicians are being paid salaries or on a sessional basis, and it appears that most provinces would like to see this trend continue. To date, however, these represent a relatively small proportion of total provincial outlays for medical services.

Against this payment backdrop, the supply of physicians in Canada has increased at rates well in excess of population growth for almost 40 years. Estimates to 1990 suggest a population:physician ratio of about 450 in Canada, closer to 400 in the United States [2]. This sustained increase in numbers of income expectations, and the growing recognition that fee controls alone do not control costs, has led a number of provinces to introduce 'macro-cost-management' techniques [20]. Negotiations in most provinces now have utilization 'on the table' (over the protests of the medical associations), and some medical associations appear to be willing to trade off fee increases for the avoidance of utilization or expenditure caps.

A 'capped' reimbursement agreement might provide for quarterly monitoring of global utilization, with fees in subsequent quarters being temporarily rolled back from schedule values in order that expenditures remain within the cap. There are a rich variety of models. All allow utilization increases for general population growth; some provide additional utilization 'room' for structural population changes or other factors; some involve the sharing of 'overages' between the profession and the Ministry of Health [20]. Finally, individual general practitioner income ceilings have been in place in Quebec for a number of years [17,20,21] in conjunction with overall expenditure caps.

The funding of hospitals is also largely from Ministry of Health budgets. Only one province still retains hospital insurance premiums. Salaries and wages of most hospital workers are negotiated province-wide, between the representative unions and associations representing the
hospital employers. The hospitals, in turn, negotiate annual operating budgets with the Ministry of Health. Historically these negotiations have been rooted rather firmly in prior years' experience, with some adjustments for new programs. An emerging trend in some Ministries of Health is the development of more sophisticated population-based funding formulae for hospitals which take account of the age, sex and even ethnic structure of the population.

Current consideration by provincial authorities of population-based funding formulae, however, goes beyond the funding of hospitals. No less than four recent provincial Royal Commission reports (or equivalent) have recommended some form of regional funding and management. But the political pressures against such a policy continue, so far, to thwart any initiatives. One province (Nova Scotia) has already announced that it will not adopt its Commission's regionalization recommendations; others have to date not been that explicit. Ontario is presently commissioning work intended to develop regional funding formulae [22], and Quebec has recently announced new initiatives that, if enacted, would see medical budgets allocated regionally [23]. It seems a safe bet that regional management structures will be developed in Canadian provinces over the next half-decade, in part because provincial Ministries of Health recognize the inherent logic of population-based funding. But those same Ministries may also recognize the advantages of deflecting the centralized political heat that results from attempts to control costs.

Operating and capital costs are funded differently, although largely from the same source. We address the latter below.

2. Managing Capital

But the long run viability of these Canadian approaches to managing health care costs will depend critically on Canadian policy-makers' will and ability to manage health care capital, including new technology. Health care capital comes in three basic forms: physical (bricks, mortar, machines and equipment), human (health care personnel), and intangible (research and development activities) [24]. All share the characteristic that resource commitments at a point in time are intended to generate a future stream of benefits; all correspondingly require the sacrifice of current consumption.

But the anticipated stream of future benefits is not the only future effect of today's commitments. Health care capital also creates a future stream of pressures for additional, complementary, capital and operating commitments. It is this fundamental characteristic of health care capital that poses the major challenge for the macro-management of the Canadian health care system and, seen from this side of the border, poses an even greater challenge for the management of health care in the United States.

This intertemporal and inter-class capital interdependence is nowhere more evident than in the relationship between physical and human capital. "[N]ew ... non-human capital brings with it demands for, or expectations of, new and often quite specialized human capital. Once the human capital is in place, idling physical capital...offers the prospect not only of turning off switches on machines, but the redeployment, or costly re-
tooling, of the complementary human resources. Not only is the physical
capital the raison d'être for the human resources, but the reverse also
becomes true in practice" [24]. New imaging technologies demanded by
hospitals wanting to 'keep up' create derived demands for physicians with
the skills and knowledge to manage them. Once the medical care team is in
place, a new set of political constituents render the job of shutting down
the capacity (even if it is established to be obsolete or ineffective)
that much more difficult. But this works equally in the opposite
direction. New, highly specialized physicians, create derived demands for
the complementary 'tools of their trade'. If fewer cardiac surgeons were
not trained, there would be fewer coronary artery bypass graft units. Once
the units are in place, a demand for, inter alia, perfusionists is
created.

The interdependence of the less tangible intellectual capital with
the other two classes is no less real. New imaging or laser therapeutic
techniques give rise to a host of new forms of physical capital, or create
derived demands for ever more highly specialized technicians and
physicians. The explosion of clinical and technological knowledge makes
mastery of any part of it increasingly difficult, creating continuous
pressures for sub-specialization as a knowledge control mechanism. And
human capital creates demands for itself. New sub-specialists covet
academic programs through which they can funnel residents to assist with
the clinical work. Educational programs tend to be supported not on the
basis of whether the products of the programs are required by the
population, but rather by the needs of the training institutions and their

The expansionary dynamic of health care capital has roots in the
explosion of physician supply in North America and Europe over the past
three decades [2,25,26]. Not only do new physicians create demands for
new complementary treatment space (hospital beds and other facilities) and
technology (their diagnostic and therapeutic arsenal), but they play
critical roles in the creation of new knowledge and techniques through
their roles in research. While Canada's current per capita supply is not
as 'rich' as that in some European countries (Germany, France), and is
actually somewhat lower than that in the United States, it is still widely
regarded (at least in Canada) as in excess of desirable levels.

Canada's management of its health care capital has been, like its
overall system management, largely macro-management. It has not been
particularly successful in managing its health human capital because,
unlike most physical capital, human capital is mobile. Each province is
accountable for health care spending within its jurisdiction, and can more
or less successfully control overall levels of funding, and the
proliferation and diffusion of physical capital. No individual province,
however, has control over the supply of physicians wishing to practice in
that province (and submit claims to the provincial plan).

The keys to physician supply control rest with individual medical
schools. Yet individual schools will argue (correctly) that reducing
their training capacity will have no necessary effect on provincial
supply, both because of inter-provincial movements of physicians trained in Canada, and because of in-migration of foreign medical graduates. There are two ironies in these arguments. First, while the logic holds for each school, it does not hold in aggregate. Yet medical schools in Canada (as in the United States) have shown no inclination to provide collective leadership on this issue. Second, the two dominant problems to which a continued influx of foreign medical graduates is the solution, are geographic maldistribution of physicians, and the service requirements of post-graduate training programs. Domestic solutions to both would again require leadership from the medical schools which has, to date, not been forthcoming [27].

The problem of inter-provincial mobility is felt most acutely in British Columbia. In the mid-1980's that province attempted to address its particular problems with physician supply growth by limiting the numbers of physicians able to submit claims for payment to the medical plan. At the end of a rather tortuous legal evolution [28], this policy was over-turned on constitutional grounds. Despite some doubt about the consistency of the B.C. Court of Appeal judgement with prior and subsequent constitutional decisions [29], no other province has yet tested the legality of this approach. In any case, a policy of limiting billing numbers has generalizability characteristics opposite to that of reducing medical school enrolments. The latter may have no effect in the province of origin, while national initiatives would affect each province. A 'billing numbers' policy, in contrast, will have a clear effect in the implementing province, but makes little sense if all provinces do it.

First year enrolment into Canadian medical schools has declined about 6% over the last seven years (although applications per place have not), and there are increasing pressures for further reductions. The pressures come, rather predictably, from provincial Ministries of Health which are responsible for meeting, or otherwise dealing with, the financial pressures created by the burgeoning supply. In contrast, despite the fact that graduation numbers 'topped-out' in 1985, there has been no reduction in overall numbers of funded post-MD training positions, or even in the numbers funded by provincial Ministries of Health [30]. This may reflect in part the lengthening of requirements in some programs. It seems equally likely, however, that the expansion in post-MD positions is increasingly driven by the self-generated 'need' for students by ever more residency programs [27].

So Canada has not, to date, adequately addressed the issue of human capital management. Relative to the United States, however, it has better managed the proliferation of sub-specialties. The Royal College of Physicians and Surgeons of Canada recognizes for certification about one-half the number of specialties recognized in the U.S. Canada's general practitioner:specialist ratio is about 55:45. This management of specialty supply is achieved through Ministry of Health provision of the funding for the vast majority of post-MD training positions. Each new residency implies a requirement for 4 to 6 new funded positions, since a position is necessary for each year of the training. The financial implications are not trivial.
But given the downstream income expectations (and the demands for complementary capital) associated with each new specialist, and the growing divergence between undergraduate training capacity and post-MD funded positions, the management record here seems no more worthy of envy than that on overall supply. We anticipate some reductions in the size of the post-MD training establishment in Canada over the next five years, despite a move toward a common two-year post-MD training requirement which would be recognized by all provincial licensing authorities. But we may be wrong—reductions in training capacity idle, or force the re-deployment of, medical school human and physical capital. The threat of such reductions mobilizes powerful and determined opposition. Such opposition has historically been quite successful because the distribution of losses is much more concentrated (and identifiable) than is the distribution of benefits from down-sizing.

As for Canada's management of physical capital, the record is relatively good. Institutional capital (new facilities and beds, new capital equipment) is funded largely through the same provincial Ministries of Health (with regional districts picking up most of the rest), although the specifics of approval and allocation vary across provinces [31, 32]. Relatively speaking, this process has resulted in an ample supply of hospital beds (which are, in fact, more frequently occupied in Canada than the United States [33]). But this supply

9 The interested reader will find a relatively detailed description of this process in one Canadian province, British Columbia, in [24].

(particularly of acute care beds) has not increased in recent years to match the growing supply of physicians [9]. Because these two forms of capital are complements, this creates a continuous source of political pressure through physician claims of system underfunding, 'shortages' and 'waiting lists'.

This centralized process of capital approval has, however, limited the diffusion of diagnostic and therapeutic technology. Because physicians cannot generally receive lump sum or fee-based funding for capital acquisitions, much of the 'high tech' is restricted to public hospitals. In turn, all hospitals in each province must go through provincial, and often regional, approval processes which provide at least the potential for the rational planning of such equipment. The hospital- and physician-based pressures to have every conceivable piece of new equipment at every hospital are similar to those in the United States. But the diffusion outcomes, the rates of utilization, and the implications for overall hospital costs, are quite different [34, 35, 36].

Even when hospitals manage to raise local funds for a CT scanner, for example, the provincial Ministry of Health is under no obligation to provide the necessary operating funds. In such a case the hospital must re-allocate within its globe, or raise the operating funds as well. Taking the former route runs the risk of raising questions within the Ministry about how the hospital found the necessary 'slack' in a budget about which it is constantly complaining. While not unheard of, then, such situations are rare.
As noted above, Canada has little role (on a world scale) in the development of technological capital. Most of it simply arrives at the border. Canada has not controlled access to new knowledge - how could it?

The macro approach to health care management instead controls, in the manner described above, the number of 'embodiments' of that new knowledge in new machinery. To date, as suggested above, the record is mixed. How successful Canada has been depends on where one is sitting, and on one's perception of the value of more relative to less of different types of health care capital. Some American observers find much to envy in the Canadian approach [37]. Others argue that the limitations on the availability of new 'high tech' capital in Canada are a serious drawback to the Canadian system, and point to the alleged flow of Canadians in search of high-tech interventions south of the border, or to long waiting lists for 'high tech' interventions, as evidence of Canadian problems. No one suggests that the management process is perfect [38]. Every health care system is a dynamic set of solutions to the continuous emergence of a series of connected and complex problems. The choice of a health care management approach is a choice among alternative sets.

From Macro- to Micro-management and back again?

Largely absent until recently within this macro-managed system has been micro- or clinical management. Provincial Ministries of Health have generally been more-or-less content to manage overall costs and the allocation of funds. While decisions have been made about the availability and location of new technology, those decisions have been made more for financial and political reasons than on the basis of effectiveness or efficiency evidence. There has been virtually nothing that looks or feels like 'managed care' as understood in the United States.

But whether this is better or worse than other alternatives, and whether Canada should (as it appears now to be doing) put more energy into micro-management initiatives (e.g. technology evaluation or continuing competence programs for physicians), depends on what we are trying to achieve through technology and system management. New technologies offer a variety of cost and outcome possibilities. This cost and outcome information is known in advance of application in only very few instances. For the rest, policy-makers must attempt to play 'catch-up', and hope they (and the population to which they are accountable) do not get too badly burned while the evidence accumulates. (Of course in many cases 'the evidence' never does accumulate, but management decisions must still be made.)

Bearing in mind that the relevant evidence is rarely available in advance, interventions (including any new approach to clinical diagnosis or therapy) may:

(a) reduce health care costs while improving or leaving unaltered the health status of recipient patients;
(b) increase health care costs but produce substantial and unequivocal improvements in the functional capabilities of recipients;
(c) increase health care costs and produce small, positive, often difficult to measure, increments in the health status of some
segments of the patient population;\textsuperscript{10} whatever their costs, yield no or negative effects on health status.

Health care managers in any system should welcome all possible occurrences of type (a).\textsuperscript{11} The management of type (b) technologies can be assisted by technology evaluation, but care must be taken in generalizing results from one setting to another, let alone across countries. Furthermore, many evaluations are themselves costly.

The primary problems of health care system management do not, however, come from types (a) and (b). Most of the micro-management (and research) effort is intended to identify and eliminate type (d) technologies. And, indeed, they have no place in any health care system. The great danger in this approach is that a single-minded pre-occupation with class (d) may skew the application of management energy out of all proportion to its relative importance. Category (c) appears to be more important quantitatively than the other three categories combined. Moreover, clinical ingenuity and technological progress are likely to ensure a growing stream of such interventions [39].

Although category (c) interventions produce small benefits for individual patients, they may make us collectively worse off because the health gains carry 'price tags' that swamp the 'benefits'. Heroic measures for the late stage Alzheimer's patient come to mind as an example of a situation where extremely costly interventions may extend life for a few hours, days, or even weeks [40]. Most of us, if given the choice at earlier stages in our lives, would choose a different process for the final stage.\textsuperscript{12} But we may not have that choice, because new technologies continue to make more things possible, and because the fact that they are there means they will be used. There are a vast array of other examples from every-day encounters with the health care system in every country that fall into this same category.

The problem with many category (c) interventions is that the ethical imperatives within the health care sector make it exceedingly difficult, if not impossible, to make choices against such 'epsilon interventions'. Cost-effectiveness evidence is unlikely to be available to the management process, because many of these every-day interventions are not individually important enough to warrant the use of limited research resources. The only practical way to reduce the occurrence of category (c) interventions is to reduce the capital and capacity that makes them possible.

\textsuperscript{10} These have been labelled the 'epsilon effects' by our colleague Pete Welch.

\textsuperscript{11} The vendors of services, however, are often less supportive. As emphasized above, reduced costs translate into reduced incomes for some vendors. If these in turn are in a position to insist that absence of harm be proven to their satisfaction before the new technology is introduced, type (a) changes may be slow in coming.

\textsuperscript{12} There are in fact two conceptually distinct issues here. Life extension per se does not necessarily represent improvement in health status. The person concerned might feel, and genuinely be, 'better off dead'. An intervention which appears as (c) when measured only by life expectancy may in fact fall into class (d). However, even for 'true' class (c) interventions, the relation of benefit to cost may be such that a representative individual, looking forward in life, might reasonably judge that she would prefer to forgo the possibility of such interventions.
How does Canada manage categories (c) and (d)? There seems little doubt that we lag behind the United States in chasing down category (d). As noted above, the macro-management approach has provided few management incentives, and in fact powerful political disincentives, to looking over the clinician's shoulder. Some evidence suggests that Canada has been doing better than the United States in addressing the epsilon problem within the hospital sector [9,34,35,41]. But it may be doing worse by providing more physician services and institutional care of the elderly. As for high technology diagnostic equipment, all that can be said is that Canada's approach of 'controlled technological diffusion' has, at least relative to the United States, controlled technological diffusion. Whether this has made Canadians better or worse off than their better endowed American neighbours, is still out to jury [2].

The American 'managed care' approach to chasing down category (d) interventions is able to muster political, and financial, support because it is identifying and promoting the elimination of unequivocal 'bads'. The Canadian macro-management approach may be coming under increasing political pressure, however, as the social consensus on which it rests is threatened by the asymmetry of information dissemination to the public. Much of what Canadian patients (like their American counterparts) learn about the possible benefits of interventions comes from the vendors, for whom doing more means doing better. The predictable result is a growing public perception of an 'underfunded' health care system, bled white by continual financial 'cut-backs'.

There is no informational counterpart to the provincial financial and managerial roles. Provincial Ministries of Health are loath to become involved in creating an organized ‘voice on the other side’ because they fear that they cannot possibly win; that they will be perceived as simply projecting a message consistent with their responsibility to control costs, without much regard for outcomes. The research and policy analysis community, that might be expected to fill this role, is too small and, more fundamentally, with few exceptions does not yet see this as a legitimate or appropriate role [42].

At the same time, the number of ‘promotional’ voices continues to grow far more rapidly than the population, and more rapidly than the real rate of economic growth of the country. Canada has, as noted above, done woefully little to manage its health human capital in a manner consistent with its approach to health care system management. Continued tight control over hospital capacity and over medical care budgets, in the face of continued rapidly expanding physician supply, offers very few possible outcomes. That of ‘loosening the public purse strings’, seems unlikely and, on current evidence, unjustifiable. That of forcing physician incomes down, perhaps precipitously, would be politically hazardous, and not necessarily fair to the large majority of the profession. Yet those are the two stark options. They ensure a continued climate of public conflict.

There is, in fact, a third option, favoured by many vendors. The
constant buffeting from the human capital that depends on an ever-expanding health care system for its own survival and prosperity, frequently surfaces in renewed calls for the introduction of private sector funding. As Iglehart [38] noted recently, Canada is alone in the Western World in its "resistance to private funding" (p. 564). User fees, in various forms, are an idea that just will not go away even in Canada. They are 'trotted out' on a regular basis by the medical profession, allegedly as a means of reducing cost pressures. In reality, they are seen by the profession as a means to increase expenditures, while reducing public cost pressures.

Nor are vendors the only advocates of higher expenditures through direct access to patients' private resources. It appears that a growing number of relatively well-off Canadians - the 'over-class'? - may be becoming convinced by the vendors' arguments that public funding cannot or will not support ready access to 'first-class' care for themselves. They are realizing that a limited use of user fees will enable them to buy their way to the head of the queue, and thus have first call on the public funds which will always form the backbone of any health care system. In the end, the funds all come from the same pockets, and so far Canadian governments have recognized this and stood by the principle of universal access on equal terms and conditions.

13 Including the American, where the rhetoric of private funding obscures the major public role in subsidizing and regulating the 'private' system.

But this, too, may be about to change. Recent federal legislation (Bill C-69) has the effect of dramatically reducing the federal contributions intended for provincial health care. It froze such contributions for a period of two years, and this freeze has recently been extended so that it will now be in place until 1995. This legislation was introduced and passed with surprisingly little fanfare or outcry, either from federal opposition parties or from the provinces, under the cover of a major (and continuing) constitutional crisis. Given the historical federal all-party support for the Canadian medical and hospital insurance programs, the relative silence from the opposition parties suggests that they have not yet fully recognized the potential ramifications. The glue that holds the 'system' together, that ensures adherence to a common set of principles by all provincial plans, is the federal fiscal role. As that erodes, as the contributions from the federal government become less important, provinces are more likely to go their own ways. In the end it may be the federal government itself, rather than the medical profession, that drives the wedge for private funding into the door. But in the process it may destroy the whole system, a possibility clearly recognized by the profession in its public opposition to Bill C-69. In our view, this legislation represents a major threat to the Canadian system of financing health care, a threat perpetrated by a federal government increasingly seen by Canadians as slowly disemboweling Canada. The implications for the possibility of macro-management of health care in Canada are not good. But whatever system (or country) emerges over the longer term, the need for such management will not go away.
The Future of Health Care Management in Canada

Despite these looming dark clouds, macro-management is likely to continue to dominate the Canadian health care economy for the foreseeable future. But there is nothing inherent in the Canadian approach that will guarantee efficiency or effectiveness in the use of health care resources. The outcome, of what gets done, to whom, where, by whom, with what complementary resources, and with what effects, is not necessarily, or even likely, the outcome that one might observe if one were able 'objectively' to rank all possible interventions and then allocate resources to them up to the current global expenditure 'ceilings'. Macro-management may be necessary to global cost control, but it is not sufficient to produce the patterns of care sought by micro-management initiatives.

Canada's record with macro-management, if viewed from the perspective of cost control, is very good relative to the United States, but not impressive relative to any other country. The current experience is, to a large extent, a product of medical education and funding decisions (capital commitments) made in the late 1960's and early 1970's. The demographic projections on which those medical school enrolment decisions were based, made in the early 1960s, have been known for nearly twenty years to be grossly in error (too high by about 35% by 1991) [27]. But capital commitment is politically far easier than capital contraction. The incentives encouraging adjustments in the face of new demographic information were simply not there.

Macro-management in Canada over the next decade may begin to look more like that in the United Kingdom, as budgeting and management responsibilities are decentralized. But the challenges for smaller managerial units will be no less daunting than those faced by the centralized provincial authorities presently, unless those authorities are at the same time willing to make some hard capital decisions that cannot be made locally.

But what of micro-management? It is at best misleading, at worst dishonest, to promote the notion that micro-management, if only there was enough of it, would achieve macro-control. As Wennberg [39] noted recently, "[t]he inventive nature of the medical mind, the endless possibilities for plausible theories, and the urge all physicians feel to work for and be helpful to their patients combine to make it impossible for outcomes research to keep up with the flow of new medical ideas" (p. 1204). Grumbach and Bodenheimer describe this phenomenon as physicians' "continual attempt to extend the borders of the medical pasture" [43, p. 121]. Micro-managed care will continue to change the shape and composition of the pie. It is unlikely to have much effect on its size. In this, it seems remarkably (and depressingly) similar to basic medical research. As each 'insulting' organism is identified, and a clinical assault mounted,
and, in the end and if necessary, imposition, may not be sustainable politically in the absence of new policy directions for capital management. A reduction in the rate of production of new physicians seems an essential starting point. But even that simple step will require a new, heretofore elusive, national consensus. Physicians are a national resource; budgets a provincial responsibility. It may be that the present fiscal climate, a growing understanding of the broader (non-health-care) determinants of population health [44], the increasing questions being raised by outcomes and procedural variations research about the population benefits of ever larger allocations of limited public funds to health care [45], and a common sense of political fatigue from the prospect of having to manage an ever-larger medical community, will finally come together in Canada to produce a new contractionist era in medical resource policy. It will not have come a year too soon.

There is increasing interest in, and effort being invested in, clinical management in Canada. But resources are not being channeled into this effort because of a belief that it will replace the need for macro-management. Rather, outcomes research, the development of clinical practice guidelines, clinical competence assurance activities and the like, are seen in the Canadian context as tools to be used to guide resource allocation and organization within global budgets, not to replace them. No amount of micro-management or outcomes research can tell a society how much of its scarce real resources it should be devoting to health care. There will always be more 'epsilon's' out there than can possibly be met. 15

This still leaves the problem of setting, and controlling, those global budgets. The present Canadian approach, of bilateral negotiation

14 The clearest example is given by 'opportunistic' infections of AIDS patients. As the T-cell count progressively declines, new infections gain a foothold. Increasing research efforts find new treatments for each, which are 'effective' only until the count falls sufficiently to bring on the next.

15 Our interpretation of what is transpiring in the United States suggests that micro-management is being saddled with a far more onerous burden. Outcomes research and managed care appear to be the new 'golden boy', the replacement for the lost promise of first more regulation, and then more competition (which was, in fact, just more regulation in different wrapping paper), as vehicles of cost control. But then, we may simply not understand...
References


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