Academic Health Sciences Centres Laid Bare

LEAD PAPER

Jeffrey C. Lozon
President and CEO, St. Michael' s Hospital, Toronto

Robert M. Fox, MBA, BSCH
Director of Diagnostic Laboratories and Pathobiology, St. Michael' s Hospital, Toronto

ABSTRACT

Academic Health Sciences Centres (AHSCs) are an enduring feature of health systems in all developed countries. In Canada, despite the lack of precise definition and standardized organizational arrangements, the educational services and programs in health sciences offered by AHSCs, and the caregiving organizations they embrace, are critical components of the national health system. Yet, the past decade has been a period of profound change in the Canadian health system. The pace of this change and the nature of the demands on the system are unlikely to abate in the near future. Given that many of these changes have directly impacted on AHSCs, or their component parts, it is timely to review these entities and to understand more fully how these organizations have been, or may be, affected in the future.

This paper identifies many of the unique attributes of AHSCs that have arisen from their threefold mission of patient care, teaching and research. The authors describe many of the most critical issues confronting AHSCs in the current era: diminishing financial support;increasing demands on the system, with little prospect of new resources; new forms of care delivery such as regional models; alternative plans for physician compensation; and new models for research funding.

The paper also examines AHSCs' interactions with organizations outside the traditional axis of health sciences faculties and related caregiving organizations. The authors point to the changing relationship between AHSCs and their parent universities as a critical element for redefinition. The mutual lack of comprehension within AHSCs and government concerning their roles and responsibilities is discussed, and new models of interaction are proposed. Given the national nature of the role of AHSCs, a closer relationship between the federal government and AHSCs is described. Dynamic changes in the traditional role of AHSCs in patient care are explored. The rapid expansion and dispersion of new technologies, the expensive nature of care, and the incongruence between specialization and the need to provide all services for educational purposes is seen as both a constraint and a threat to AHSCs. In the matter of education, the fundamental instability of offering a diverse range of educational programs without secure and understandable funding is explained, while also highlighting the potential changes that could arise from Alternative Payment Plans (APPs).

AHSCs are an excellent example of the enduring nature of relationships founded on shared purposes and goals. As organizational entities, AHSCs fail the most basic tests for accountability and transparency, since they are often too complex and loose to be described fully – even by those who are leading them. Yet, the authors contend that continued support and improved organizational understanding are essential to the vitality of the future of the Canadian healthcare system. AHSCs are here to stay, but changes are needed to ensure that they improve on the delivery of the key processes of research, care and education that rest at the heart of their social contract.

Introduction

Peter Drucker, one of the foremost management theorists of this century, has called the modern teaching hospital the most complex organization ever created (Goldsmith 1985). First, the goals of patient care, teaching and research are potentially in conflict. Second, the teaching hospital has a high concentration of professionally trained and well-educated medical staff who use the hospital's facilities and incur costs without an employment relationship. Third, the hospital's fundamental output is that of improved health – an outcome that is at the best of times difficult to define and harder still to measure. It is little wonder that Drucker reached his conclusion. However, with the greatest respect, we believe he got it wrong.

Had Drucker examined the teaching hospital with a wider lens, he would have discovered that the Academic Health Sciences Centre (AHSC) represents an even more labyrinthine entity, orders of magnitude more complex and bewildering than a "simple" teaching hospital. The AHSC is a curious organization that consists of the modern teaching hospital, a Faculty of Medicine, related research institutes and other health sciences faculties extending to the central administration of the university. When one adds to the mix a regional health authority and varying funding agencies, the stew becomes even richer.

Given the complexity of AHSCs and their central role in the healthcare system

– and in light of continued political pressure to further modernize the delivery system – it is prudent at this time to lay bare the reality of the AHSC and to evaluate what these organizations represent. In doing so, this paper will explore the highly complex and at times paradoxical intricacies of the definition, mission, evolution, funding and governance of AHSCs, with the aim to demonstrate how these unique entities will reassert their value in the new era of healthcare.

Some readers may conclude that, because of the complexity and rather loose nature of their confederacy, AHSCs are destined for extinction. Those among this group are cautioned to take heed. AHSCs have endured for more than a century and during that time have proven themselves resilient in the face of enormous pressures. We are confident that the AHSC is here to stay. However, the future shape, direction and roles of these multifaceted entities are less clear.

Background

The term Academic Health Sciences Centre is a relatively recent label given to the relationship that exists between university-level health/clinical education programs and the affiliated hospitals/health regions that provide the physical facilities necessary for research and education. The roots of the AHSC began in Europe in the Middle Ages when schools of medicine became part of university education. Prior to that time, training in the "healing arts" occurred outside formal educational organizations. Bulger (1995) notes that "in the United States, medical schools began to unite with universities at the end of the 19th century." In Canada, the affiliation of medical schools with universities dates back to the earliest days of medical training. Now all Canadian medical schools are associated with universities. The literature indicates that this relationship has been mutually beneficial, if not always easy, as the pressures and forces that have shaped the university hospital and the Faculty of Medicine have at times driven them apart. As Bulger notes, "At the end of the century this traditional alliance (medical schools and universities) is being questioned, *even threatened by marketplace demands*, as medical schools and their universities continue to deal with internal struggles regarding teaching and research goals and funding" (Bulger 1995; emphasis added).

Defining the AHSC

Literature on AHSCs lacks a consistent use of nomenclature and a comprehensive definition, which, as a result, prevents clear understanding of the breadth, structure, purpose, ownership and multifaceted needs of these organizations.

Breadth. Arguably the most critical issue that arises from the lack of a "proper" definition for the AHSC is that its true interdisciplinary breadth is seldom articulated. Relevant literature focuses almost singularly on the relationship between the Faculty of Medicine and the teaching hospital, to the exclusion of other health sciences disciplines such as nursing, dentistry, pharmacy and the rehabilitation therapies. For example, Ontario's Task Force on the Funding of Academic Health Sciences Centres (PCCCAR 1997) defined an AHSC as "an affiliation or working relationship between a university that has health professions

schools, including a medical school and one or more teaching hospitals." Other disciplines do not define the AHSC in the same terms as a Faculty of Medicine. Why are AHSCs still defined by their relationship with their medical faculty? The definition is clearly out of date, and is widely recognized as such. However, those who would argue against it are normatively correct, but not practical. This article will follow the prevailing, albeit "practical" tone set by the literature and will explore the AHSC as framed in the context of the relationship of the medical school and the teaching hospital/region. This is not to suggest that the relationships of the other disciplines with the hospital are inconsequential or uninteresting. Rather, it reflects the reality – for better or worse – that the medical school/hospital axis shapes the forces within the AHSC. The other health sciences disciplines either fit within that, or have evolved to exist in harmony outside of it. A word of caution, however: in perpetuating this one-dimensional emphasis on the Faculty of Medicine's role in the AHSC, the industry risks losing sight of the richness within, and distinction between, the multi-disciplines and their relationships with the teaching hospital site.

Structure. A comparison of the country's 16 medical schools, their parent university and their relationship with their teaching sites would not produce a common definition of an AHSC. Tendencies? Yes. Conformity? No. As Griner and Blumenthal (1998) note, "When you have seen one medical school you have seen one medical school." The same can be said for the AHSC.

Purpose. Barondess (1991) writes that "the academic health center, the massive complex that has supplanted our medical schools … has come to incorporate a greater research establishment, patient care of an increasingly complex, costly and desperate nature, and the education and training of a large array of healthcare workers. This structure, as it emerged was, we said, the expression of a set of responsibilities characterized as a three legged stool, the legs representing teaching, research and patient care." The Task Force on the Funding of Academic Health Sciences Centres emphasizes that "the role of AHSCs is to educate health professionals, provide clinical care (particularly complex, specialized tertiary and quaternary care) and to undertake research that will continue to improve health and healthcare" (PCCCAR 1997). Both of these definitions are incomplete and out of date because they do not reflect the broad development of regional care delivery systems that have occurred in roughly 80% of the country. The significance of this will be addressed in depth later. The definitions do, however, illustrate the underlying tension among the AHSC's three missions of care, education and research – tensions that run high when resources are scarce.

Ownership. The notion of ownership is not frequently discussed in the health literature, but requires some attention. In the United States, the university typically owns both large medical schools and their teaching hospitals. Developments in American AHSCs have often been shaped by the nature of this ownership and essentially are a question of how best the university can arrange its affairs.

In Canada, teaching hospitals/regions are not owned and operated by the university, but exist as separate entities. Thus, despite their common missions, these two separate organizations often struggle in their attempts to align their activities and strategic priorities. A relationship defined by affiliation and not ownership is an important distinction, as we shall see.

Taking these nuances into account, for the purposes of this article an AHSC will be defined as *the totality of university health professional schools, including a Faculty of Medicine, associated research enterprises and care delivery organizations that provide physical facilities and funding for education and research, and which are aligned towards a common mission of advancing patient care, education and research.* Is the hospital with a select number of teaching programs part of this entity? Yes. Should some element of the larger university administration be included? Yes. Yet clearly, even this definition fails to put precise or finite boundaries on the AHSC, such that, regrettably, we are still left to analyze and propose future directions for a relatively nebulous and misunderstood entity. But such is the "nature of the beast" we know to be public healthcare.

Forces Shaping the AHSC

AHSCs are an essential, some would say pivotal, component of the Canadian health system, but like all elements of the system they have endured profound change during the past decade, and indications are that the rate and extent of the change will not slow in the foreseeable future. Indeed, a review of AHSCs at this time underscores many of the key forces driving the system and impacting on all sectors of healthcare. Some of these forces are outlined below.

1. *Resource Reduction*. The decade of the 1990s witnessed deep reductions in health and education funding as governments in Canada, the largest funders of the system, sought to balance budgets. These reductions were felt throughout the systems, and within the AHSC – consumers of great portions of provincial funding – the cuts were deep and their effects are still being felt. Because the AHSC receives funding from a variety of sources, the reductions that were experienced came at different times and to varying degrees to the components of the AHSC. This tested the strength of the affiliation and produced aberrant behaviour by all actors. While governments now seem to be in the growth funding mode, the demand for service still outstrips the resources available, and this is not likely to change into the future.

2. *Accountability.* Accompanying the resource squeeze has been the mantra of greater accountability for the expenditure of public funds. The increasing importance of accountability poses a great challenge to AHSCs because accountability requires clarity of funding channels and outcomes. The AHSC is extremely complex, and the simple requirement to follow the money is fundamentally challenging to an entity that does not have clear organizational lines. Moreover, even if these funding flows can be determined, they are no more than a guideline to the leadership given the integrated nature of the AHSC. Add to that the dilemma

about counting and defining outputs, and it is easy to see how the AHSC could be threatened in an era of accountability.

The question of how to best characterize the relationship of the constituent parts of the AHSC is a real one. In their recent article, Weiner et al. (2001) have developed a number of analytical models to understand the relationships within AHSCs. Even a cursory review of this valuable typology shows how within the Canadian context the relationships of the components shift. AHSCs cannot and do not fit into a specific and easily understood organizational framework. They change with time or to conform to the issue at hand making the challenge more futile.

3. *Human Resource Shortages.* Canada is experiencing a major shortage of health personnel and the problem will become greater before it gets better (PCCCAR 1995b). Does that mean that AHSCs have failed in their training role? If not, then to remedy the matter will require major strategic investment in an already expensive AHSC. How will the shortage of human resources affect AHSCs, and how will they respond to this situation?

4. *New Organizational Structures and Funding Relationships.* The 1990s also saw the rise of regional structures, which fundamentally changed the traditional teaching hospital/faculty relationship. Is this good or bad for AHSCs? Clearly, the old balance of power that was the basis for much of the history of these entities is no longer applicable. Will this lead to new organizational arrangements with the funders, and what type of relationships within the AHSC are emerging? Likewise, will the growth of alternative funding plans change AHSCs, and if so, how?

5. *Research Renewal.* Canada is undergoing a research renaissance, and with this, the demands on the AHSC for growth to respond will be enormous (PCCCAR 1995c). It also demonstrates how the old paradigm that research was solely a university purview is no longer accurate. The full range of the partners in the AHSC will need to respond if we as a country are to maximize this new opportunity.

These are only some of the new and emerging pressures on AHSCs, and it would not be an exaggeration to suggest that every force in the healthcare system, from integration to accountability, will serve to potentially shape the AHSC into the future. Continued excellence in the system will require adaptability by leaders in AHSCs to meet these challenges

The AHSC and the Education Mission

The common commitment to educating health professionals lies at the heart of the AHSC. Yet, as with most aspects of the AHSC, the educational role is characterized by some fundamental dichotomies. The university admits students to health disciplines and establishes policies that govern their academic activities. Through the affiliation with the hospitals, these students receive part of their education away from the university

by educators that are most likely not paid by the university. Patients who come to the hospitals or similar caregiving organizations are exposed to these students, who may be at varying stages of training. Indeed, the patients are often the raw material for the educational process. Trainees must abide by the policies and procedures of the teaching site, but university rules and regulations govern their activities. The university is preeminent in the education mission of the AHSC, as universities are the degree-granting bodies. But the relationship operates successfully because the caregiving organization is willing to accept the higher costs and is committed to the same educational mission.

The funding of the education mission of the AHSC is, like most other aspects, a mélange of sources, none of which is completely traceable nor sufficient, but which taken together seem to enable the entity to continue. There are many sources for the funds necessary for the education mission of the AHSC. In Canada they come from *at least* two separate provincial government departments, and in the case of provincial Ministries of Health, they come by several separate and distinct routes. They can be distilled into the following four main funding streams (Fulfilling the Mission 1995).

1. *Operating Grants to Universities.* Ministries of Advanced Education provide the university with block grants for students at both the undergraduate and post-graduate level. These grants are not provided to the AHSC, but are given directly to the university, which in turn provides a budget to the health sciences faculties. These faculties may also provide basic science training to students who are not health sciences majors. The budget provides salaries for faculty, principally campus-based, and their support staff as well as the university infrastructure, which is applied not only to education but also research. In general, as the provincial governments have reduced their expenditures, universities and their health sciences faculties have endured budget reductions. This is not the major educational funding source, although it should be. Unfortunately, it is still unknown what proportion of the education mission is funded from this source.

2. *Health Ministry Clinical Education Budgets.* In a number of provinces, the ministry responsible for health provides a specific amount to the hospitals or regions, which in turn may or may not be transferred to the universities to support medical education. This funding to some extent goes to support the work of clinical faculty and their support staff. Most important, it also goes to pay the salary for post-graduate trainees. These people are students of the university, but given that they are graduates who provide necessary patient care service, they are remunerated. No one knows the proportion this arrangement contributes to the education mission.

3. *Health Ministry Operating Grants to Hospitals/Regions.* Being part of an AHSC is an expensive proposition – whether because of the existence of students or the nature of care provided. AHSC teaching hospitals and regions with teaching responsibilities are more

costly than non-teaching sites (Mechanic et al. 1998; Fried et al. 1994). The amount of the difference is not well understood. Many have attempted to isolate the cost of the educational mission with varying degrees of success. Still, no one knows the exact amount of the operating grants that are attributable to the education mission of the AHSC.

4. *Clinical Earnings.* Most of the clinical faculty members that teach medical students do so without direct remuneration from the university or hospital/region. They are members of clinical practice plans and enter into an income-sharing agreement with partners to conduct education and research. These activities are funded through pooled clinical billable earnings. The responsibility for this education is not necessarily borne equally by a clinical faculty, but is undertaken by the group as part of their responsibilities. This funding source gives rise to interesting paradoxes where the training of undergraduate students may in fact reduce the clinical faculty income while the training of post-graduate trainees may actually generate faculty income. No one knows how much this source of funding contributes to the education mission of the AHSC. However, it is widely believed that it is the major source of educational funding.

The education mission of the AHSC as it pertains to medical education is fraught with issues related to governance and funding. Funding as it relates to other health professional education is also worthy of review. In the first instance, there is a growing need for balanced interdisciplinary education that has not been embraced, evolved or funded to any extent. In a healthcare environment that has been built on the premise of highly specialized and qualified professionals, it is not surprising that no programs exist within the AHSC or the university to integrate training so as to develop teamwork among the professionals or establish a common education delivery mechanism.

Human Resources Planning

Given the central role played by AHSCs in the education of all health professionals, and the seemingly endless cycle of boom and bust in terms of availability of health human resources, a logical question would be: Have these expensive and high-profile entities failed in a fundamental way to provide or participate in regional, provincial or national planning to avoid these damaging cycles? The constraints on human resource availability have created a highly competitive recruiting environment. This is highlighted by the increase in human resource spending, as demonstrated by the number of agency staff and escalating specialist staff salaries/payments. Similarly, the quality of service has been threatened by the temporary arrangements and imbalances between staff supply and patient demand.

While AHSCs can be seen as being interested in their own respective local circumstances, and in that way have contributed to the feast and famine cycle, to lay the blame at their feet is inappropriate. What is important, however, is the number of times that the question and/or implication of changes in training slots is undertaken on a unilateral basis by either the educational organization or the clinical

organization. It has been far too common to have the clinical site on the receiving end of shifts in training programs. These growths and reductions cause a "scramble" response not fitting to a coordinated AHSC.

The AHSC and the Patient Care Mission

Teaching hospitals/regions regularly embark on strategic planning exercises aimed at shifting and refocusing their tripartite mission of research, teaching and patient care. The processes and goals of these exercises are significantly different from those applied by private corporations when they engage, for example, in re-engineering, changes to a product line or the retooling of their workforce. The primary difference lies in the fact that teaching hospitals/regions are to a large extent a product of forces beyond their control. Consider, for example: the teaching hospital's reliance on the medical school for a steady stream of students and residents; the physician/government-negotiated physician funding structure; the complex government-driven hospital funding formula; and the requirement that teaching facilities provide students with a comprehensive array of clinical services for training opportunities.

Thus, as part of the AHSC, the teaching hospital is restrained by a number of factors that are critical to the management of its operations and yet, to a disproportionate extent, are shaped and controlled by external forces. The purposes for which they exist extend beyond their control and can only be executed in concert with others. This has deep and far-reaching implications and is especially evident in the area of patient care. Unlike a corporate environment, the teaching hospital/region must provide specific services, not only because they are required as health services but because they are critical to the education of trainees. The notion that academic hospitals/regions can reduce the number of services and increase the degree of specialization runs counter to the need to provide trainees with a broad educational experience. Consequently, the efficiencies considered inherent in specialization can never be fully achieved.

Co-Dependence with the Faculty of Medicine

The AHSC structure is founded on a formal affiliation agreement between the university and the teaching hospital/region. The teaching hospital is responsible for the provision of clinical training facilities and access to "in-the-field training" with senior physicians. The university, in turn, supplies the hospital with students, residents and professors – additional "hands" who can assist with clinical activities. The current medical curriculum requires students to receive training in the full spectrum of healthcare, from primary prevention to secondary, tertiary and quaternary care. As a result, the need to remain competitive and relevant for student placements makes it imperative for teaching hospitals to provide a full array of "general hospital" services and restricts them from identifying a niche or area of focus. It seems that the teaching hospital has become a "quasi-firm" of the medical school (Fried et al. 1994).

Teaching hospitals understand that students and residents provide patient care, and teaching faculty that work in these facilities benefit from this service

in a number of ways. However, the educational bodies are essentially solely responsible for determining the size of the medical school class and the number of training placements available for the various clinical subspecialties through discussion with the appropriate funding agency. Teaching hospitals/regions are not involved to a significant extent in making these decisions. Additionally, as the community becomes more cognizant of the importance of health promotion, teaching hospitals experience new pressures to modernize their long-standing reputations as "ivory towers" of acute care, teaching and research by refocusing their role to encompass greater emphasis on health promotion, injury prevention and functional outcomes.

Physician Incentives

The fee-for-service (FFS) funding for most physicians provides an incentive to maximize the number of procedures and attain a higher income. This is in contradiction to the hospital/region's goal of operating within a global budget and as efficiently as possible. Additionally, professors within the AHSC can receive University status, which could include space and resources provided by the teaching hospital/region to support their clinical service.

The FFS model may work at cross-purposes with the holistic clinical mission of the hospitals. This is evident when the revenue-generating capacity of the physicians is compromised by more focused programs and services defined by organizational strategic direction. It is possible that the physician may induce demand when certain practice groups grow their physician numbers or when patient volumes are reduced (Folland and Stano 1990). Such occurrences are hard to identify and can conflict with the hospital patient-care planning process or accountabilities for efficient and effective resource use.

Alternatively, physicians are economically disadvantaged when required to provide time for teaching and research endeavours. To be a part of the shared mission of the AHSC, physicians relinquish their autonomy and take on opportunity costs that their community peers do not. In response, academic physicians commonly form groups that ensure a balanced income even though there may be an imbalance in the nature of their work. Notwithstanding the pooled income arrangements, most academic physicians earn less then their community counterparts. These plans are required to contribute to and lever the salary-generating potential by enabling the growth and development of teaching, research and other non-salary activities. It is axiomatic that self-directed physician contribution is one of the major resources supporting the teaching and research missions of the hospitals and medical school. As a result of the dependence on this arrangement, the AHSC is in a position of modest influence in the structure, growth and development of these activities. The ACMC/ACTH Committee on Academic Health Sciences Centres has recognized the limitations in the FFS arrangement and its effect on the relationship between the academic faculty and their teaching hospital: "Neither structures nor incentives exist to nurture the partnership in a way that ensures all partners work together for the common good in a cooperative way and to facilitate the conjoint planning around recruitment,

clinical and research programs, new initiatives, one-of-a-kind units, or common administrative supports" (ACMC/ACTH 1995).

Years of financial restraints on AHSCs have forced them to partner with those who control the majority of their costs. Given that there is no clear consensus about the optimal payment mechanisms for physicians in AHSCs, there can be an imbalance between the three roles of clinical service, education and research caused by the current method of physician payment. Given that the future of funding is so unclear, there is reluctance to fully embrace other payment mechanisms. As Machiavelli said, there is nothing more difficult to create than a new order of things (Machiavelli 1952), and a move to new funding arrangements for physicians in AHSCs is testament to that. The discontinuity of priorities among the AHSCs has resulted in a growing dissatisfaction with the prevailing FFS model. An institutional Alternative Payment Plan (APP) for physicians requires a fundamental change in the model of compensation and will need to be shaped by the hospital and university's role, mission and organizational structure.

In the United States, AHSCs have responded to financial pressures by forming alliances with community-based primary care providers. Such changes have resulted in a shift away from FFS to capitation payments and costs per covered life. This restructuring allowed for a shift in the traditional hierarchy. This is valuable information when we consider how a shift away from FFS can benefit the Canadian AHSC (Correspondence CMAJ 1999; Dean's letter 1994; Fox and Wasserman 1993; Godwin et al. 1999; Haslam 1995; Haslam and Walker 1993; Iglehart 1993, 1995, 2000; Kassirer 1994; Rogers et al. 1994; Schroeder et al. 1989; Stoddart and Barer 1992, 1999: Valberg and Gonyea 1994, 1995).

Toronto's Hospital for Sick Children achieved consistency in departmental funding and a rebalancing of clinical, teaching and research functions under the first Ontario Alternative Payment Plan. It also discovered that there was a greater shift to outpatient and community-based services as a result of this and other changes initiated. It can be assumed that the incentives became more aligned to multiple stakeholders in the AHSC (Haslam 1995). The Southeastern Ontario Academic Medical Organization (SEAMO) also found advantages in its arrangement between the university, Faculty of Medicine, Clinical Teachers' Association of Queen's University and the teaching hospitals. In a survey of the changes that had taken place, it was discovered that there were fewer patients referred to the consultant, even though the consultants reported that their time spent on patient care had increased. More time was spent on the complex cases, and there was no consistent adverse impact on research or teaching activities. It can be assumed that these changes have resulted in better planning and operational decision-making (Simon 1995; Sinclair 1995; Goldwin et al. 1999; Correspondence, CMAJ 1999).

A comprehensive plan is required that incorporates the needs of the AHSC, OMA, government, university and hospital/region. The Ontario government has recognized the importance of innovative funding. As a result, it has made the

formation of APPs available on a voluntary basis a priority and has rewarded their creation by increasing revenues of participating hospitals. Traditional measures of activity could shift to evaluations based on patient outcomes and system-wide problem-based care. The limitations of the FFS environment on the tripartite mission of patient service, teaching and research point to a more probable APP solution. However, the road to implementation is long and arduous, so progress may be slow.

Patient Care Programs

Hospitals/regions are regularly faced with issues that can only be solved by benefiting one stakeholder at the expense of another. An example of where this tension is the greatest is in the balancing of emergency patient admissions with elective surgery. By offering world-class emergency services, the teaching hospital/region must be forced to cancel urgent and elective surgeries when the beds become filled. A chronic capacity issue can result in patient surgery cancellation while emergency patients are prioritized. Alternatively, emergency queues can arise if priority to electives is given. This has a direct effect on physician incomes given the FFS basis.

One of the key requirements of an AHSC is a balance between high-end tertiary services and the need to serve the health needs of the local catchment area while sponsoring preventive services. In an AHSC, the tertiary programs have always drawn the lion's share of the resource and to some extent the notoriety. Conversely, the preventive aspects of healthcare and the need to serve the local population are seen as priorities by funders and health policy-makers. The balance is also an important one to maintain in terms of the educational experience. Striking the right balance has an impact on physician income as well as other aspects of the AHSC and constitutes an ongoing struggle within the AHSC. Efficiency demands as defined by government funding have changed the admission process in many hospitals and created even greater demands on the resources of hospitals and agencies. Clinical care, teaching and research programs targeted to the homeless and under-housed are gaining momentum and serve to highlight the contradictory nature of each care organization's mission, the funding formula and health policy (Commonwealth Fund Task Force 2001).

Even though hospitals endeavour to plan their programs and services, most teaching hospitals end up with a range of services not dissimilar from community hospitals. They are differentiated only by their training programs, research initiatives, more complex patient populations and selected tertiary services. Due to the complex academic and research demands on the AHSC, there are inherent inefficiencies built into the operations. The cost to operate the AHSC is much higher (Fried et al. 1994), and even though there is some justification, the exact differences in costs and benefits are uncertain. Some speculate that the nature of AHSCs has a negative effect on patient satisfaction scores. This may potentially erode their reputation as having the best clinical outcomes based on their staff expertise. The opportunities and prestige that accompany the once isolated and dominant AHSC are seen as a trade-off for an equally demanding service role. Again, the AHSC attempts

to juggle the competing demands while maintaining a reputation for quality, service and innovation.

As the costs of the teaching hospital/region rise relative to the general hospitals, the performance gap begins to narrow, since unique skills and technology are easily shared throughout the system (Roberts 1999). Increased funding to hospitals outside of the AHSC has allowed them greater opportunities to utilize technology as more and more hospitals are equipped with the newest MRI, CAT scan, operating tools and information technology. This strengthened performance has a direct effect on patient care in many non-teaching environments. Diagnostic and clinical interventions are becoming more of a commodity that is widely applied, and as a result, the community health centres can and do benefit from the teaching hospitals' discoveries in clinical and operational research. The less complex nature and individuality of the non-teaching hospitals allows them to implement a more formal accountability and responsibility structure.

The actual growth of resources in the community has not resulted in significant changes to the burden of patients occupying the acute care beds. A lack of formalized outreach initiatives has prevented AHSCs from gaining greater control over their patient flows and resulting operational efficiency and effectiveness. One significant differentiation between the AHSC and the community centre, however, is in the area of technological innovation. The AHSC and its associated teaching hospitals play a pivotal role in the implementation of new systems that leverage technology to optimize the tripartite mission. Even though the AHSC is playing the leadership role that it is empowered to do, it is, again, challenged by the increased resource burden associated with the early adoption of new technologies or the possible disincentives created by the current funding arrangements.

Complex Funding Models

The teaching hospitals comprise only 6% of hospitals and yet receive about 36% of the total operating expense pool (Fried et al. 1994). The more that we study and reinvent the way the AHSC is funded, the more complex it becomes. This growth in complexity is the result of factors in the conceptual framework that are intended to account for every hospital situation, patient condition and activity mix. Funding agencies may discover that there is a marginal outcome and quality of process difference between all hospitals, and then need to look at organizational purpose within the system as a whole. Even now, the AHSC is expected to be a leader in the ability to manage cost per case at the micro level while delivering a complex set of programs to advance a tripartite mission.

The AHSC and the Research Mission

Compared to the rest of the world, Canadian researchers rank second in their relative citation impact in clinical medicine (PCCCAR 1997). This is impressive considering the pressures that face the healthcare system and the demand for resources and, until recently, very low levels of research funding. However, Canada also has one of the worst returns on this investment from a monetary

perspective. It has been reported that with a $0.25 return for every dollar invested, Canada is far behind the Americans, who produce $30 for every dollar invested (PCCCAR 1995c). Some may think that this capitalistic approach trivializes or demeans the professional and scholarly pursuit of knowledge. However, when it comes to the granting of funds, a positive return on investment may enable longer commitments of funds, expansion in the reach of the resources or reinvestment in emerging areas such as epidemiology and technology. To reap the potentially large rewards, the AHSC must now develop processes to take commercial advantage of the many developments that exist in the realm of science.

The unique "quasi-firm" relationship between the university and the teaching hospital has demonstrated that sharing responsibilities with the full range of constituents can be beneficial. Teaching hospitals within the AHSC can use their research mission to formulate an identity and reputation that distinguishes them from the community hospitals and one another. Even though there is not a formal marketing activity by hospitals, the more popular a program becomes as distinguished by its research and clinical training expertise, the greater the attraction of that specific service. Hospitals are then able to support their emphasized programs by highlighting them. The development of a research program can therefore enable a teaching hospital to carve out a specific niche or identity; however, this autonomy comes with the cost of supporting the research infrastructure and its related training programs. This is of clear benefit for the university since the resource burden is shifted from the university to the teaching hospital, but the former maintains greater involvement and input into the planning process and recognition for discoveries/publications. Research control by only one part of the AHSC is limited by the multiple accountabilities and responsibilities that exist.

Research Institutes

To strengthen research, teaching hospitals use their influence on donors, granting agencies and private sector contacts to fund significant portions of their research programs. By gaining financial support for research through the formation of research institutes, the teaching hospital/region signifies its commitment to research and sets up a unique organizational entity to protect its research commitment. Further developments in the area of alliances, partnerships, mergers and privatization will allow the institutes to compete on a greater scale. These entities also reflect an understanding of the fragility of research in organizations devoted to service and education.

Research as the Silver Bullet

Research could be the opportunity for the AHSC to reassert its unique role within the system. With greater opportunities to share teaching programs, and considering the patient-care program similarities with community hospitals, the principal mission left for AHSCs to grow is research. The explosion in biotechnology offers significant opportunities for the AHSC. The university and hospitals have a key role in industry and can play even greater roles in the future.

Success brings with it revenue-generating possibilities that have to date only been explored superficially. Clinical trials

research activity is not new to the AHSC, but it is far from maximized in its potential. There is a possibility to turn a hospital-based cost into a revenue source. Such a change will allow for other research initiatives that more formally influence care at the bedside, clinical outcomes, disease prevention and the ability to capitalize on technology. This new revenue possibility would allow the AHSC to make decisions on reinvestment into patient care programs and teaching.

The AHSC and Government

There exists an important reciprocal arrangement between the government and the AHSC. The government acts as a funder and policy-setter for the AHSC, while the AHSC is the consumer of vast amounts of provincial and national resources, provider of complex patient care needs, driver of research prosperity and a training ground for future generations of caregivers. Given this essential cooperation, the lack of respective knowledge is shocking. Governments know very little about AHSCs and what shapes their internal decision-making structures. In turn, AHSCs are surprisingly impervious to changing government realities. To some extent, the problem is that both parties do not have the necessary structure to relate to one another. It also underscores that the complex nature of the relationships within AHSCs are such that they consume more of the time of the leadership than does developing and nurturing a relationship with government that contributes to health policy.

The 1990s were a period in Canadian healthcare when governments, driven by deficit financing, imposed major structural and financial change on the healthcare system (PCCCAR 1997). To our knowledge, no government has considered the AHSC as an integrated whole. Instead, changes were imposed using two distinct approaches. Most governments reduced funding to both healthcare providers and to universities at different times and to differing degrees. This was the fiscal fallout of the 1990s. Simultaneously, in many provinces a regional system of healthcare governance was imposed that had the impact of changing some of the key dynamics of AHSCs. The impact of both approaches is still being felt.

AHSCs responded by resisting the financial reductions. They developed the tried-and-true financial coping strategy of milking the sources of least reduction and shifting the pain within themselves. However, even these strategies had limited utility given the growing demands of service, education and research. It is noteworthy that during this time of deep change neither the governments, who initiated the reform, nor the AHSCs, who coped with it, responded in a coordinated and integrated fashion. The lessons from this lack of systems thinking are many.

Given that, in most provinces, at least two provincial departments fund components of AHSCs and that there is little communication between them, it is not surprising that there is a lack of coherent AHSC policy. This situation is even more perplexing when the government watchword is "accountability." It would be hard to imagine an entity in the public system that has fewer integrated accountability mechanisms back to the funding source than AHSCs. It is beyond the government at this stage to even track the source and application of funds that go into the AHSC, let alone advance more

rigorous tools such as value for money audits.

With regard to the AHSCs, the lack of interest and knowledge about government in its totality diminishes their capacity to influence policy and contribute to long-range planning in a meaningful way. Governments tend to view AHSCs as self-serving, and consequently, genuine efforts to participate in broad health policy development may fall short of potential. To always see the policy process from a self-interest perspective tends to reduce influence and lead to automatically discounting the advice. The government agenda in healthcare is broader than that of the AHSCs, and it is not clear that the latter will contribute to policy development that does not have a direct relationship to their core function. It is important also to recognize that AHSCs, while principally funded and regulated by provincial governments, have active and important ties at the federal level, particularly in the area of research. However, the interaction between government and AHSCs is not directed to the entity, but geared more to its component parts. Importantly, it raises the question of whether these centres should be considered as national resources and funded as such.

One of the key questions that is raised in the context of understanding the relationship of the government to the AHSC is the degree to which there is an actual AHSC structure and to what degree there is a relationship of convenience. When it comes to relating to government, the AHSC as an entity does not exist for all practical purposes. Posed from the perspective of the government, why in an era of accountability would government departments that have a vested interest in research, service and education not set up formal mechanisms to manage the relationship with these key providers of public service? Finally, if either party did attempt to structure a more consistent and coherent approach to policy development and execution, who would benefit? Would it be the students, patients and researchers? Would it be the government from the fiscal perspective? Or the AHSC from the funding perspective? How can the AHSC respond to the demands of various stakeholders?

Accountability for Performance Data

As the technological revolution lumbers into healthcare, the data "mining" and reporting capabilities of health information systems are increasingly apparent. Information technology has become a standard focus of strategic development within most hospitals, particularly among those belonging to AHSC structures. The importance of generating conclusive information has reached new heights. So too have the power struggles over the use of and accountability for this information.

Health information systems are only just in their infancy and currently show little capability to demonstrate cross-functional integration or standardization of measurement. Yet, multiple stakeholders at all levels of the healthcare system apply the information generated by these systems in critical decision-making processes. For example, a hospital inpatient unit can use data on a patient's length of stay (LOS) in planning for its anticipated occupancy rate and/or establishing targets for best practice. Hospital management will use the same data in planning the organization's budget and

creating its operating plan. The same information is also used by the Ministry of Health to determine hospital-funding allocations or by patients/"consumers" in evaluating their level of satisfaction with care. Non-providers, such as think tanks, associations and private consultants, use length of stay data to demonstrate quality improvement opportunities or as a thermometer of the potential of the healthcare system in general. In the United States, this information is used as a marketing tool to illustrate performance variation and to improve a health provider's competitive position. American health information capabilities outreach those in Canada and go so far as to enable public access to surgeon-specific and procedure-specific survival rates, with user-friendly analyses broken down by institution and complexity factors. Canadian systems have nowhere near reached this level of sophistication. Yet, with the constant pressure to maximize the potential of limited resources, stakeholders are using information-reporting capabilities to drive provider accountability.

The waters are further muddied by the lack of consistency in the use of data sources, the methodologies applied in data collection, the assumptions driving data analyses and the perspectives used in their interpretation. Many management and quality theorists have noted that "one must measure before you can manage" (Lisoski 1998). The authors, however, argue that *once measured, you should be forced to manage.* As a result, control of the healthcare system is often driven by those who gather and report data, and this may have unintended consequences on the AHSC. For example, the media may publicly report an apparent Emergency Department "crisis" and rally the public to hold the government and care providers accountable for an intervention. However, arguably, if all system pressures were duly examined and prioritized accordingly, the original "crisis" may very well fall to a lower position on the healthcare industry's "To Do" list. There is grave risk in allowing any provider, whether a hospital region, AHSC or individual hospital, to be controlled and even to some extent politically manipulated by isolated, incomplete and or inaccurate information. This misalignment of incentives and performance optimization may cause providers to manage by the data, or manage to optimize the data.

The AHSC has and continues to play a lead role in the development and reporting of comparative health services information. Analyses of trends in operational data allow hospitals to demand more from their internal operations by identifying opportunities to reduce unnecessary variation. In doing so, management is equipped with enhanced tools for holding the medical, nursing and support staff accountable for maximum output. Benchmark data also allow for the identification of best-practice performance and the ability to share successful performance improvement strategies with peer organizations. It has been reported, for example, that the return on the additional cost for AHSC hospitals is not only the delivery of the teaching and research mission, but also shorter lengths of stay and mortality rates as compared to their risk-adjusted, non-teaching counterparts (Rosenthal et al. 1997). This type of operational research is rapidly gaining momentum and is currently led by teaching hospitals in partnership with their

university. Similarly, this information allows the AHSC to present concrete performance data to the Ministry of Health to demonstrate the effects of policy changes related to clinical service, teaching and research. As a result, the AHSC has an avenue for negotiation regarding change and it helps to illustrate how demand for services may be affected by changes in supply reductions.

The AHSC and the University

For most Canadian healthcare professionals, the relationship between the AHSC, the Faculty of Medicine and the central university leadership has been invisible or distant. In many cases, the faculty has been the university. Increasingly, however, the relationship between the university and the AHSC has to be viewed, like all relationships, as dynamic and needs to be explored, nurtured and understood. The senior university administration plays an important role in the development of such a relationship.

The relationship between the university and the AHSC is a matter of academic debate in the United States, and some elements are pertinent in the Canadian context. In the United States, this relationship has always been of primary importance to the AHSC, in no small measure because the historical roots there revolve around a common ownership of the hospital by the university. Broad university policies and practices have always had a fundamental impact on the AHSC in U.S. settings. Notwithstanding the common ownership, or perhaps because of it, the relationship within the AHSC between the university, the medical faculty and the teaching hospital has come under new pressures. Given the increasingly competitive marketplace and the growth of managed care, universities and their affiliated hospitals are implementing fundamental changes in their governance and structures not previously contemplated. Barchi and Lowery (2000) note that "changes in the financing of medical care and the organization of healthcare delivery have affected the medical school-university partnership." Further, Halperin et al. (1995) note that "universities and medical schools differ significantly in their sources of revenue, cultures of promotion and tenure, academic values and decision-making processes." These authors and others like them point out that the relationship between the university, the medical faculty and the teaching hospital sites is one that requires constant attention.

In Canada, this has been a neglected area of study, but we predict it will become more important in the future. One reason should be the need for greater accountability over the inputs and outcomes of the AHSC. It has already been noted that governments are missing an important opportunity by failing to look at AHSCs as more integrated entities. This failure should be addressed, and in so doing, the relationship between the university and the AHSC will be revealed. Another reason why the relationship needs to be better understood is the changing structures within the delivery of the missions of the AHSCs. As hospitals/regions pursue larger research goals and as the educational function relies increasingly on the partnership inherent in AHSCs, the constraints and benefits imposed by central university governance on the AHSC need to be recognized.

To some extent, the rebirth of Canadian research has already done that. Nothing crystallizes the attention of healthcare like new money unless it is the withdrawal of old money. With the advent of new research funding through the Canada Research Chairs and Canadian Institute of Health Research, as well as the Canadian Foundation for Innovation, the need for university/AHSC cooperation has never been greater. The potential for disagreement also has grown.The matter of overhead for research is a case in point.

The research of the AHSC is a combined effort of the university and the affiliated teaching hospitals/region. The former is the home of research, but the latter has devoted considerable energies and resources to the research enterprise as well. Health agencies have been turning their considerable fundraising capabilities to the area of research and are embracing it both financially and as part of their core mission. Universities have led the charge for more research funding from government coffers. Both partners in the AHSC challenge one another with respect to the often slow-to-emerge funding for overhead, how it will flow, to whom and at what price. The final chapter on this matter has not been written, but clearly it will be one more test of the strength of the AHSC and its relationship with the larger university.

If governments were to recognize the integrated nature of the AHSC, then it would be essential for the nature of the relationship between the AHSC and the university to be laid bare. Any attempt to increase accountability of AHSCs in a fundamental way – either by asking for a complete accounting of resources or by seeking answers to questions about value for money – would require an in-depth understanding of this relationship. It has been a long-held notion that in times of tight budgets, universities have used increasingly more hospital and clinical resources to support their mission. There are no accepted facts to support this view, but there is widespread belief that it is true. Clearly, as the need for accountability grows, this relationship will need to be reconsidered.

The Effect of Regionalization on the AHSC

The role of the AHSC is threatened when it is rolled into a larger network of healthcare services. The IDS or regionalized health authorities are the brokers of competing activities that extend beyond the medical schools' teaching, research and clinical care activities of their associated teaching hospitals. The formation of these large, networked corporate entities forces the university to compete for resources and responsibilities. As a result, the power and autonomy of the medical school in its interaction with the healthcare community has been changed. The medical school focus on teaching and research has had a reduced priority to clinical services for patients and budget balancing, particularly as regions were formed. This reduced academic priority is evident in the absence or limited representation of the university and medical school on a health region's large and diversely represented governing board of directors. The medical school is now forced to plan within the confines of the region instead of determining its individual needs and plans. Within the regionalized network, the teaching hospital role is

expanded to work in harmony with primary care and alternative level of care or home-care services. The creation of these complex, diverse and mammoth organizations diminishes the interorgan-izational competition of the isolated teaching hospital and the Faculty of Medicine. A focus on clinical service renews the emphasis on healthcare as a patient-driven function at the possible expense of academics. Commonly generated budgetary considerations have reached a greater level of importance as well.

From a financial perspective, it is extremely hard to isolate the budget reductions specifically targeted at the academic component of a regional restructuring effort. By limiting the influence of the medical school and at the same time enhancing the control and positive interaction of the teaching hospitals with their community hospitals and services, significant opportunities for synergy and incentive pairing result. However, it takes a very long time to build a rich academic culture, and it may take as long – or it may be impossible – to build it throughout the region, components of which have had no previous academic history.

An informal proposal has been made in more than one region to have the medical school separate from the university and affiliate with the health region. The health sciences faculties may be better positioned by aligning with the region, since together their relative size and capabilities may be greater than that of the university. In times of fiscal restraint, the region may have more resources, capabilities and incentive to support the medical school than the university. This is not only potentially beneficial for the medical faculties' survival, but it offers more significant benefits for cooperative synergy and growth in research, teaching and clinical service. This development will be of considerable interest in the future.

Recommendations

The forces at play on and within AHSCs are complex and ever-shifting. AHSCs are large, diverse entities with many constituents. It is no wonder that the acronym CEO (Chief Executive Officer) of such institutions can be redefined as a Career Ending Opportunity (Lomas 2000). Continuous criticism and helplessness has been a common tone to this discussion. However, there are a number of recommendations that logically flow from the issues facing today's AHSCs and their challenge to maintain the tripartite mission in the face of uncertainty and minimal control.

1. *A Common Vision for the AHSC*
   Each AHSC should be required to develop a process whereby clear, explicit and thoughtful missions and visions are developed. This process will be vital to the successful outcome and should include the leadership of the university, hospitals and other care providers. The mission statement should clearly identify priorities for patient service, education and research. It should reference and call for the creation of formal conjoint planning bodies that will give rise to actual strategies to achieve this mission. While all the components of the AHSC probably have a mission statement, it is unlikely that any exists for the AHSC as a whole. Only when discussion and planning for an effective mission is agreed upon will the decision-making within the AHSC become clear.

2. *The Role of Government*
   Governments at the provincial level should consider establishing standing entities to oversee and provide stable funding to the AHSCs. These bodies could be set up as a hybrid of government agencies with appropriate representation from the ministries responsible for science, health and education, thereby replacing the disjointed funding streams from current ministries. They would work in collaboration with the AHSCs to develop rigorous accountability frameworks. The mandate of such entities would be to understand the operations, issues and incentives that shape the current AHSC and its many stakeholders and to ensure that the social missions are met. Accountability must be established to improve efficiency and effectiveness of the AHSC tripartite mission. The group's challenge is to understand all of the interactions and nuances of each of the players in the group.

3. *AHSCs as National Resources*
   The federal government should enhance its role in funding research in the AHSC and the healthcare system in general. Its leadership role will provide formal commitments to areas of development and growth of national research initiatives. No longer can the AHSC struggle to arrange funding from a variety of providers and without the support of the federal government. Examples of successes in this field include the National Health Grants program (Health Facilities Development Fund) that helped to launch many medical schools including those of McMaster University and the University of Alberta (Hall 1964). If such programs were enacted on a national scale, leadership opportunities would emerge. Planning and development at the AHSC level would be strengthened, allowing for the research environment to become more competitive on an international level. The involvement of all levels of government and the AHSC is pivotal to the future health of our society.

4. *AHSC Leadership in the Management of Patients, Information and Human Resource Planning*
   The AHSC could be charged with the responsibility to lead health service integration, planning, information and technological standardization on an integrated basis. By sharing the patient care responsibility with the complete health sector, the optimal providers will assume the care of those most in need of their services. Even though there are requirements for teaching hospitals to provide complete services, there is an opportunity to establish bi-directional partnerships for primary and secondary care between the AHSC and community hospitals. As a result, some may grow and some may shrink. For example, the AHSC may only offer "boutique" services while family practice clinics are linked in the periphery. By currently being all things to all people with no pure control over operational planning, we have a large opportunity for improvement. This level of cooperation may be difficult to achieve, but it is the only choice that exists before the option of competitive privatization. Similarly, the AHSC

continues to struggle internally to maximize human resource training and utilization. A cohesive HR plan that models a supply and demand relationship for healthcare is required that meets the needs of all stakeholders and is not simply governed by yearly transfers to universities.

5. *Alternative Funding Models for Physicians* An alternative funding arrangement with AHSC physicians is essential to remove barriers caused by conflicting interests and incentives. Once the incentive barriers are removed, more creative planning will optimize the balance of clinical service supply with fluctuating patient demand. Economists believe that the elimination of a FFS model may have a detrimental effect on productivity and will actually raise the total costs in the system. This is due to the reduced incentive to maintain the FFS volume levels, and as a result the institution will require more salaried physicians to do the same amount of work. However, by fixing the output requirement, the responsibility will be shared and the incentives of the hospital are aligned with the once-private practitioner. Physician-induced supply and sacrifices made to the practice plans in support of teaching, research and clinical care are also minimized. This would result in a more appropriate utilization of services, reduced conflict and tighter controls on operating plans.

Conclusion

The history, nature and current configuration of AHSCs across the country are different and at different stages of evolution. The notion of a common vision of an AHSC regarding its contribution to the health and education systems and the society that it serves is impractical. However, to draw some conclusions from the foregoing and to then suggest some structural and other recommendations is both worthwhile and necessary.

1. AHSCs are an enduring example of the triumph of shared commitments and goodwill over efficient organization and clear accountabilities. The extent to which they have endured in more or less the same form throughout their history serves as an example of how basic understandings and shared values can overcome organizational ambiguity and chronic low levels of confusion. However, it is precisely this shared value that makes them so hard to understand and difficult to change.

2. Each AHSC is different from another. This difference is apparent in the various priorities given to the common missions of service, education and research. It also reflects the various constellations of organizations and participants that have different degrees of authority. It is precisely these differences that preclude a cookie-cutter approach to organization and programs. Weiner et al. (2001) describe a typology by which AHSCs can be categorized and understood from an organizational perspective. They note eight different classifications and go on to note that they can be combined and changed over time. No wonder these entities defy common visions.

3. The impacts of health sciences disciplines other than medicine are

submerged in the AHSC. To date, they have not played a major role in the AHSC for a variety of reasons.

4. AHSCs have suboptimal relationships with their parent universities and with the various government agencies that contribute to their funding and regulation. These relationships are characterized by a lack of understanding on all parts. Traditional notions of accountability are therefore foreign in the context of these crucial relationships.

5. AHSCs are only a component of both the health and education systems, and any assumption that they should take a leadership role beyond their mission of service, care and research should be approached cautiously. Participants in the AHSC often advance these notions, and it is noteworthy that these ideas do not come from governments or other providers. When and if major system change is initiated, the AHSC must be seen as a participant and a stakeholder but probably not the generator of new models of delivery or funding.

6. The forces facing AHSCs, while profound, are no more frightening or threatening than those they have endured. In terms of the key factors facing AHSCs, the most relevant are related to the need for greater accountability, alternative physician funding plans and the continuing sorting out of academic priorities in a regionalized delivery model.

7. Given the size of our country and the real need for national programs around human resource planning and research (the latter already being reinvigorated), there should be much greater interaction between AHSCs and the federal government, while simultaneously preserving the current relationships at the provincial level.

Contained within AHSCs are examples of the very best and also the most worrisome aspects of the Canadian healthcare system. Everyday acts of compassion in the most sophisticated healthcare environment in existence are routinely performed with exceptional skill. Clinical service is at its highest level, and some of the most advanced educational processes are at work. Yet, basic elements of accountability and transparency are under-developed or non-existent. In an era of public sector financial restraint, growth pressures have never been greater. The old Dickens quote, "It was the best of times, it was the worst of times," comes to mind. What is, however, more important is how AHSCs can take this moment to transform themselves to make even greater contributions to our health system and the society it services.

References

ACMC/ACTH Committee on Academic Health Sciences Centres. 1995. "Together in the Academic Health Sciences Centre: Renewing the Partnership, A Policy Paper."

Allcorn, S. and D.H. Winship. 1996. "Restructuring Medical Schools to Better Manage Their Three Missions in the Face of Financial Scarcity." *Academic Medicine* 71(8): 846–57.

Barchi, R.L. and B.J. Lowery. 2000. "Scholarship in the Medical Faculty from the University Perspective: Retaining Academic Values." *Academic Medicine* 75(9): 899–905.

Barer, M. and G. Stoddart. 1995. "Academic Health Centre Funding in Canada: Then and Now and Then." National Conference on the

Future and Funding of Academic Health Science Centres, April, pp 3–12.

Barondess, J. 1991. "The Academic Health Center and the Public Agenda. Whose Three Legged Stool?" *Annals of Internal Medicine* 115(12).

Bigenwald, C.A. 1995. "Perverse Incentives or Perverse Behaviour." National Conference on the Future and Funding of Academic Health Science Centres, April, pp. 70–75.

Bland, C.J. 1997. "Beyond Corporate-Style Downsizing: A Better Way for Medical Schools to Succeed in a Changing World." *Academic Medicine* (72)6: 489–95.

Blumenthal, D. and S.O. Thier. 1998. "Leveling the Playing Field: A Report of the Commonwealth Fund Task Force on Academic Health Centers." *Journal of Urban Health: Bulletin of the New York Academy of Medicine* 75(2): 330–46.

Brieger, G.H. 1997. "Why the University-Based Medical School Should Survive: A Historical Perspective." *Academic Medicine* 72(5): 362–69.

Bulger, J. 1995. "Generalism and the Need for Health Professional Educational Reform." *Academic Medicine* 70(1) Supplement: S31–S34.

Capper, S.A. and C.A. Fargason. 1996. "A Way to Approach the Strategic Decisions Facing Academic Health Centers." *Academic Medicine* 71(4):37–42.

Cohen, J.J. 1996. "Learning to Care, for a Healthier Tomorrow." *Academic Medicine* (71)2: 121–25.

Commonwealth Fund Task Force on Academic Health Centers. 2001. "A Shared Responsibility. Academic Health Centers and the Provision of Care to the Poor and Uninsured."

Correspondence, CMAJ. 1999. "Are Alternative Funding Plans a Good Idea?" *Canadian Medical Association Journal* 161: 485–89.

Craig, P. and R. Bandaranayake. 1993. "Experiences with a Method for Obtaining Feedback on a Medical Curriculum Undergoing Change." *Medical Education* 27: 15–21.

Dean's letter. 1994. "Alternative Funding Plan." Kingston: Queen's University.

Drucker, P.F. 1994. "The Age of Social Transformation." *The Atlantic Monthly*, Vol. 274, No. 5, pp. 53–80.

Emery, J.C., C. Auld and L. Mingshan. 1999. "Paying for Physician Services in Canada: The Institutional, Historical and Policy Contexts." Working Paper Series, Issue 99–6.

Engelberg, J. and P.O. Bosomworth. 2000. "The Academic Medical Center of the Future: A Center for Integrative Study." *Academic Medicine* 75(2): 194–96.

Fogelman, A.M., L.D.Goode, L. Behrens, C.D. De Angelis, J.D. Forsyth, B.L. Gewertz, J.L. Houpt, J.J. Hutton, W.N. Kelley, D. Korn, L.J. Marton, A.P. Tartaglia, A.G. Wallace, W.R. Wallin and F.M. Walters. 1996. "Preserving Medical Schools' Academic Mission in a Competitive Marketplace." *Academic Medicine* 71(11): 1168–99.

Folland, S. and M. Stano. 1990. "Small Area Variations." *Medical Care Review* 47(4): 434.

Fox, P.D. and J. Wasserman. 1993. "Academic Medical Centres and Managed Care: Uneasy Partners." *Health Affairs* 3: 85–93.

Fried, B.J., G.H. Pink, G.R. Baker and R.B. Deber. 1994. "Managing Health Services Organizations with an Educational Mission: The Case of Canada." *Journal of Health Administration Education* 12(2): 173–85.

Fulfilling the Mission, Conference Summary. 1995. National Conference on the Future and Funding of Academic Health Science Centres.

Gallin, J.I. and H.L. Smits. 1997. "Managing the Interface between Medical Schools, Hospitals, and Clinical Research." *Journal of the American Medical Association* 277(8): 651–54.

Gardner, J. 1995. "Troubled Teaching Hospital Restructures for the Future." *Modern Healthcare*, July 10, p. 17.

Godwin, M., S. Shortt et al. 1999. "Physicians' Perceptions of the Effect on Clinical Services of an Alternative Funding Plan at an Academic Health Sciences Centre." *Canadian Medical Association Journal* 160: 1710–14.

Goldsmith, J.C. 1985. "Visions of Empire: Some Problems with the Corporate Model of Hospital." *Hospital Forum* 28(3): 50–52.

Griner, P.F. and D. Blumenthal. 1998. "Reforming the Structure and Management of Academic Medical Centers: Case Studies of Ten Institutions." *Academic Medicine* 73(7): 818–25.

Hall, Mr. Justice. 1964. "Royal Commission on Health Services." Ottawa, ON: Queen's Printer, Vol. 1, p. 71.

Halperin, E.C., R.L. Bryny, S. Moore and P.S. Morahan. 1995. "What Medical Schools and Universities Can Learn from One Another." *Academic Medicine* 70(10): 879–83.

Hartz, A.J., H. Krakauer, E.M. Kuhn, M. Young, S.J. Jacobsen, G. Gay, L. Muenz, M. Katzoff, R.C. Bailey and A.A. Rimm. 1989. "Hospital Characteristics and Mortality Rates." *New England Journal of Medicine* 321(5): 1720–25.

Haslam, R. 1995. "Five Years' Experience with an Alternative Payment Plan: What Have We Learned?" National Conference on the Future and Funding of Academic Health Science Centres, April, pp. 57–62.

Haslam, R.H. and N.E. Walker. 1993. "Alternative Funding Plans: Is There a Place in Academic Medicine?" *Canadian Medical Association Journal* 148(7): 1141–46.

Henikoff, L.M. 1999. "Implications of Evolving Healthcare – Changes for Tertiary Care Specialties Such as Neurosurgery: Practice, Teaching, and Research in the Future in the Academic Setting." *Surgical Neurology* 49(6): 665–69.

Heyssel, R.M. 1994. "The Challenge of Governance: The Relationship of the Teaching Hospital to the University." *Journal of Medical Education* 59: 162-68.

Hollenberg, C.H. "The Effect of Healthcare Reform on Academic Medicine in Canada." *Canadian Medical Association Journal* 154(10): 1483–89.

Hutton, G. 1995. "Regionalization and the Social Contract with Regional Boards in Quebec." National Conference on the Future and Funding of Academic Health Science Centres, April, pp. 38–48.

Iglehart, J.K. 1993. "The American Healthcare System – Teaching Hospitals." *New England Journal of Medicine* 329: 1052–56.

Iglehart, J.K. 1995. "Rapid Changes for Academic Medical Centres." *New England Journal of Medicine* 332: 407–11.

Iglehart, J. 2000. "Forum on the Future of Academic Medicine: Final Session – Implications of the Information Revolution for Academic Medicine." *Academic Medicine* 75(3): 245–51.

Janeway, R. 1995. "Health System Reform: Whither the Academic Medical Center?" *Southern Medical Journal* 88(6): 689–93.

Karpf, M., R.G. Schultze and G. Levey. 2000. "The Decade of the Nineties at the UCLA Medical Center: Responses to Dramatic Marketplace Changes." *Academic Medicine* 75(8): 781–92.

Kassirer, J.P. 1994. "Academic Medical Centres under Siege." *New England Journal of Medicine* 331: 1370–71.

Korn, D. 1996. "Reengineering Academic Medical Centers: Reengineering Academic Values?" *Academic Medicine* 71(10): 1033–43.

Krauss, K. and J. Smith. 1997. "Rejecting Conventional Wisdom: How Academic Medical Centers Can Regain Their Leadership Positions." *Academic Medicine* 72(7): 571–75.

Lewis, S.J., D. Kouri, C.A. Estabrooks, H. Dickinson, J.J. Dutchak, I. Williams, C. Mustard and J. Hurley. 2001. "Devolution to Democratic Health Authorities in Saskatchewan: An Interim Report." *Canadian Medical Association Journal* 164(3): 343–47.

Lisoski, E. 1998. "If You Can't Measure It You Can't Manage It." *Supervision* 59(6): 8–10.

Lomas, J. 2000. "Rethinking for Today or Rethinking for Tomorrow?" Healthcare*Papers* 1(3).

Machiavelli, N. 1952. *The Prince*. Toronto: The New American Library of Canada.

Mackelm, P.T. 1990. "The Influence of Governmental Decision-Making on Academic Medicine: The Quebec Experience." *Clinical and Investigative Medicine* 13(4): 219–22.

McMurtry, R. 1995. "AHSCs: Sustaining Ventures for Their Communities." National Conference on the Future and Funding of Academic Health Science Centres, April, pp. 31–34.

Mechanic, R., K. Coleman and A. Dobson. 1998. "Teaching Hospital Costs: Implications for Academic Missions in a Competitive Market." *Journal of the American Medical Association* 280(11): 1015–19.

Miller, R.F. 1999. "University of Minnesota." *Academe* (November–December): 47–50.

Nonnemaker, L. and P. F. Griner. 2001. "The Effects of a Changing Environment on Relationships between Medical Schools and Their Parent Universities." *Academic Medicine* 76: 9–18.

O'Brien, B., J. MacDonald, B. Holmes and D. Kaufman. 1996. "Learning Opportunities for Internal Medicine Residents: Comparison of a Tertiary Care Setting and a Regional Setting." *Academic Medicine* 71(3): 284–86.

Ontario Hospital Association. 1999. "A Balanced Scorecard for Ontario Acute Care Hospitals. Report '99."

PCCCAR Reports. 1995a. "The Future of Ontario's Academic Health Sciences Centres." Prepared by the Subcommittee on the Role, Function and Financing of Academic Health Sciences Centres, February.

PCCCAR Reports. 1995b. "Equitable Health Human Resources Distribution: Fulfilling Underserviced Area Needs." May.

PCCCAR Reports. 1995c. "Ontario's Academic Health Science Centres: Sustaining Ventures for Their Communities." August.

PCCCAR Reports. 1997. "Funding Academic Health Science Networks: An Investment in the Future."

Roberts, A. 1999. "University Challenge." *Health Service Journal*, March 4, pp. 20–22.

Rogers, M.C., R. Snyderman et al. 1994. "Cultural and Organizational Implications of Academic Managed-Care Networks." *New England Journal of Medicine* 331: 1374–77.

Rosenblatt, M., M.R. Rabkin and D.C. Tosteson. 1997. "How One Teaching Hospital System and One Medical School Are Jointly Affirming Their Academic Mission." *Academic Medicine* (72) 6: 483 –88.

Rosenthal, G.E., D.L. Harper, L.M. Quinn and G.S. Cooper. 1997. "Severity-Adjusted Mortality and Length of Stay in Teaching and Nonteaching Hospitals: Results of a Regional Study." *Journal of the American Medical Association* 278(6): 485–90.

Rowand, R.S. 1995. "Together in the Academic Health Science Centre: Renewing the Partnership." National Conference on the Future and Funding of Academic Health Science Centres, April, pp. 13–17.

Scheuer, J., J. Mladenovic, L.B. Gardner, M.A. Sande and C.P. Clayton. 1996. "Developing Strategies for the Future of Academic Public Hospitals." *American Journal of Medicine* 101(November): 449–54.

Schimpff, C. and M.I. Rapoport. 1997. "Ownership and Governance of University Teaching Hospitals: Let Form Follow Function." *Academic Medicine* 72(7): 576–88.

Schroeder, S.A., J.S. Zones et al. 1989. "Academic Medicine as a Public Trust." *Journal of the American Medical Association* 262(6): 803–12.

Sherwood, T. 1993. "The Teaching Hospital and Medical School AD 2010." *Journal of the Royal College of Physicians of London* 27(4): 418–19.

Shine, D., S. Beg, J. Jaeger, D. Pencak and R. Panush. 2001. "Association of Resident Coverage with Cost, Length of Stay, and Profitability at a Community Hospital." *Journal of General Internal Medicine* 16(1): 1–8.

Shine, K.I. 1995. "The Future of Academic Health Centers." *The Physiologist* 38(2): 51–55.

Simon, J. 1995. "The SEAMO Model: The OMA Perspective." National Conference on the Future and Funding of Academic Health Science Centres, April, pp. 68–69.

Sinclair, D. 1995. "Alternative Funding: The Comprehensive SEAMO Model." National Conference on the Future and Funding of Academic Health Science Centres, April, pp. 63–67.

Stoddart, G.L. and M.L. Barer. 1992. "Toward Integrated Medical Resource Policies for Canada: The Roles and Funding of Academic Medical Centres." *Canadian Medical Association Journal* 146(11): 1919–24.

Stoddart, G.L. and M.L. Barer. 1999. "Will Increasing Medical School Enrolment Solve Canada's Physician Supply Problems?" *Canadian Medical Association Journal* 161: 983–84.

Takahashi, T. 1997. "An Academic Teaching Hospital – The Japanese Model." *World Hospitals and Health Services* 33(3): 12–15.

Taylor, D.H, Jr., D.J. Whellan and F.A. Sloan. 1999. "Effects of Admission to a Teaching Hospital on the Cost and Quality of Care for Medicare Beneficiaries." *New England Journal of Medicine* 340(4): 293–99.

Taylor, P.L. 1999. "Clinical Integration and New Options for Academic Medical Institutions in Network Development." *Academic Medicine* 74(3): 213–20.

Their, S.O. 1994. "Academic Medicine's Choices in an Era of Reform." *Academic Medicine* 69(3): 185–89.

Tjam, F.S. 1997. "University Teaching Hospitals: An Outline of Some Major Issues." *World Hospitals and Health Services* 33(3): 35–39.

Valberg, L.S., M.A. Gonyea et al. 1994. "Planning the Future Medical Centre." *Canadian Medical Association Journal* 151(11): 1581–87.

Valberg, L.S. and M.A. Gonyea. 1995. "New Conceptual Framework and Financial Design for Academic Medical Centres in Canada." National Conference on the Future and Funding of Academic Health Science Centres, April, pp. 18–25.

Weiner, B.J., R.J. Culbertson and R. Dickler. 2001. "Organizational Models for Medical School – Clinical Enterprise Relationships." *Academic Medicine* 76(2): 113–24.

Weitekamp, M.R., L.E. Thorndyke and C.M. Evarts. 1996. "Strategic Planning for Academic Health Centers." *American Journal of Medicine* 101(September): 309–15.

Williams, J.F., R.K. Riegelman and J.H. Grossman. 1999. "Academic Health Centers Can Bridge the Gulf between Medicine and Public Health." *Academic Medicine* 74(5): 484–87.

Wingo, C.S. 1997. "Are Academic Medical Societies Needed in a Changing Healthcare Arena?" *American Journal of the Medical Sciences* 314(6): 357–64.

Internet References

"Aab Institute of Biomedical Sciences, University of Rochester Medical Center." www.urmc.rochester.edu/Aab/index.html

"Harvard Medical Center." www.hmcnet.harvard.edu/anaesthesia/virtualh.html

"NYU Health System: Organizational Framework." www.hcahealthcare.com

"Visit to University of Calgary Faculty of Medicine, October 28-29, 1996." ww.med.ufl.edu/oea/cc/calgary.html