FISCAL SUSTAINABILITY & THE TRANSFORMATION OF CANADA'S HEALTHCARE SYSTEM

A Shifting Gears Report

Will Falk
Matthew Mendelsohn & Josh Hjartarson
with Alex Stoutley

School of Public Policy & Governance
UNIVERSITY OF TORONTO

PURPOSE

This report from the Mowat Centre and the School of Public Policy and Governance at the University of Toronto, supported by KPMG, is intended to help facilitate informed, strategic, long-term decision-making in healthcare in Canada. This report is part of the Shifting Gears series.

The Mowat Centre and the School of Public Policy and Governance have undertaken this study because of our commitment to better understanding how governments can improve their ability to deliver high-quality public services and public policy, even in times of fiscal constraint.

KPMG has supported this study financially because of its commitment to help its clients understand the challenges faced by governments and to contribute to the discussion of strategies that can be used to address these challenges.

CONTENTS

Fiscal Sustainability & the Transformation of Canada's Healthcare System
A Shifting Gears Report

By Will Falk Matthew Mendelsohn & Josh Hjartarson, with Alex Stoutley

Report produced by the Mowat Centre and the School of Public Policy & Governance at the University of Toronto, supported by KPMG.

ISBN 978-1-927350-08-9

EXECUTIVE SUMMARY

Healthcare spending is skyrocketing in Canada and governments are struggling to find the money to pay for it. For example, if current trends continue, by 2030 healthcare will account for 80 per cent of Ontario's budget, up from 45 per cent today. The trends are no different in other provinces.

But current trends simply cannot continue. Something has to give. Governments will need to either raise large sums of money to delay budget calamity or embrace transformative change in the healthcare system. "Straight line" projections of indefinite yearly increases in health spending are misleading. They do not, in fact, demonstrate that spending will bankrupt governments. Rather, a new phase in the spending cycle will begin and, as in the past, impending fiscal crisis will force change.

Transformative change is possible. Healthcare has seen major technological changes and innovations during the past decade. Through years of investment to reduce wait times, measure the quality of care, and introduce technological innovations, governments and healthcare providers have created a platform for cost-savings. When access and quality improve, costs often drop.

Attention must now focus on how to recover the cost-savings that new service delivery models and new technologies have seeded within the healthcare system. Technological advancements and more efficient ways to provide care have meant that per unit costs of many procedures have been falling. Unfortunately, these efficiencies have not necessarily reduced government spending. Instead, added volumes have actually led to increased public spending since the fee paid by governments for each procedure has often remained the same or even risen. The healthcare pricing mechanism is fundamentally broken.

Transformative action will require a shift in how policy makers think about and respond to changes in the healthcare system. This shift in perspective can be achieved through the application of four concepts:

1. **Use disruptive innovation as a framework to understand changes in technology and service delivery**

2. **Recognize that Moore's Law—which suggests declining costs over time—applies to healthcare and recover productivity gains as they emerge for the public purse**

3. **Focus on improving quality and access as costs decline**

4. **Treat healthcare as a high-tech industry**

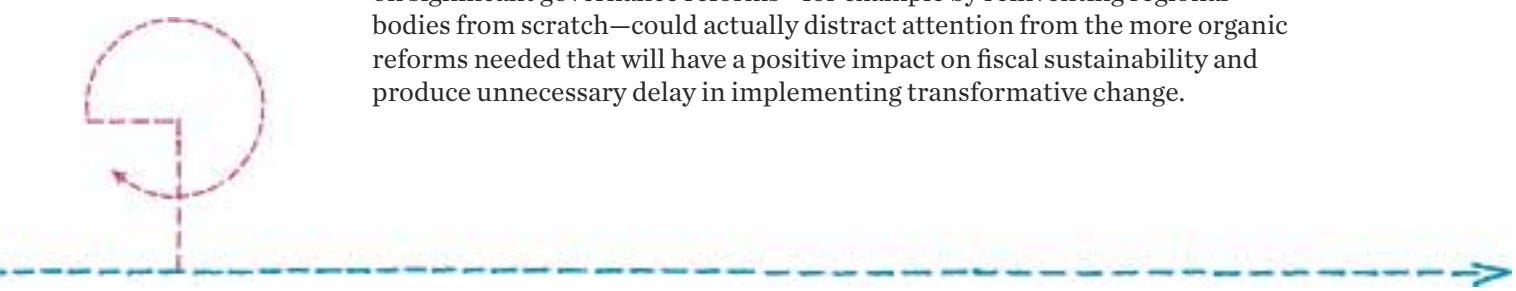
These concepts will be applied throughout this report to identify ways in which Canadian healthcare systems can be transformed. The application of these four approaches leads to a set of five transformative reforms that governments should consider. These would likely produce short-term government savings, but also a healthcare system that can respond to continuous change in a fiscally sustainable way:

1. **Modernize the organization of hospitals by disrupting clinical business models**. The current system, where many procedures are done either in general hospitals or in a doctor's office, does not allow efficiency gains to be realized. Much that goes on today in a general hospital could be provided more efficiently elsewhere: academic centres could focus on excellent diagnostic work-ups, specialty clinics could provide routine procedures efficiently and accessibly, and networks of care could monitor patient well-being. As today, these alternative organizational structures would exist as part of the public healthcare system and, oftentimes, within the governance umbrella of existing hospitals.

2. **Use virtualization to develop new roles for providers and patients**. The virtualization of provider-patient and provider-provider interactions is creating new opportunities for healthcare system redesign and sustainability. It comes at a time when the scopes of practice of various health professionals are already changing quickly in many settings. Virtualization can allow health professionals to use the telephone and email for patient interaction—as well as encouraging more breakthrough technologies. Virtualization will also mean that healthcare access will no longer be contingent on geography and region, thereby allowing more savings without adverse effects on care. Export markets and new revenue streams could also open up for Canadian providers of care.

3. **Widely deploy digitization in the second decade of Infoway**. After years of government capital investment in health information technology, operational costs have now begun to fall in areas like diagnostic imaging. Policy makers need to actively recover the cost-savings from these productivity gains and reinvest them. They can support the process of IT modernization by reforming agencies so that they can respond to technological change more quickly, and by providing more of the available IT funding directly to care providers. This may begin by supporting grassroots innovation in healthcare, including the use of smart phones and tablets to enable doctors to communicate more effectively and deliver treatment more quickly.

4. **Devolve decision-making selectively and where appropriate**. Policy makers should consider expanding the accountability functions of regional bodies, strengthening specialty care networks, and supporting organic mergers and acquisitions within the system. Any system transformation primarily focused on significant governance reforms—for example by reinventing regional bodies from scratch—could actually distract attention from the more organic reforms needed that will have a positive impact on fiscal sustainability and produce unnecessary delay in implementing transformative change.

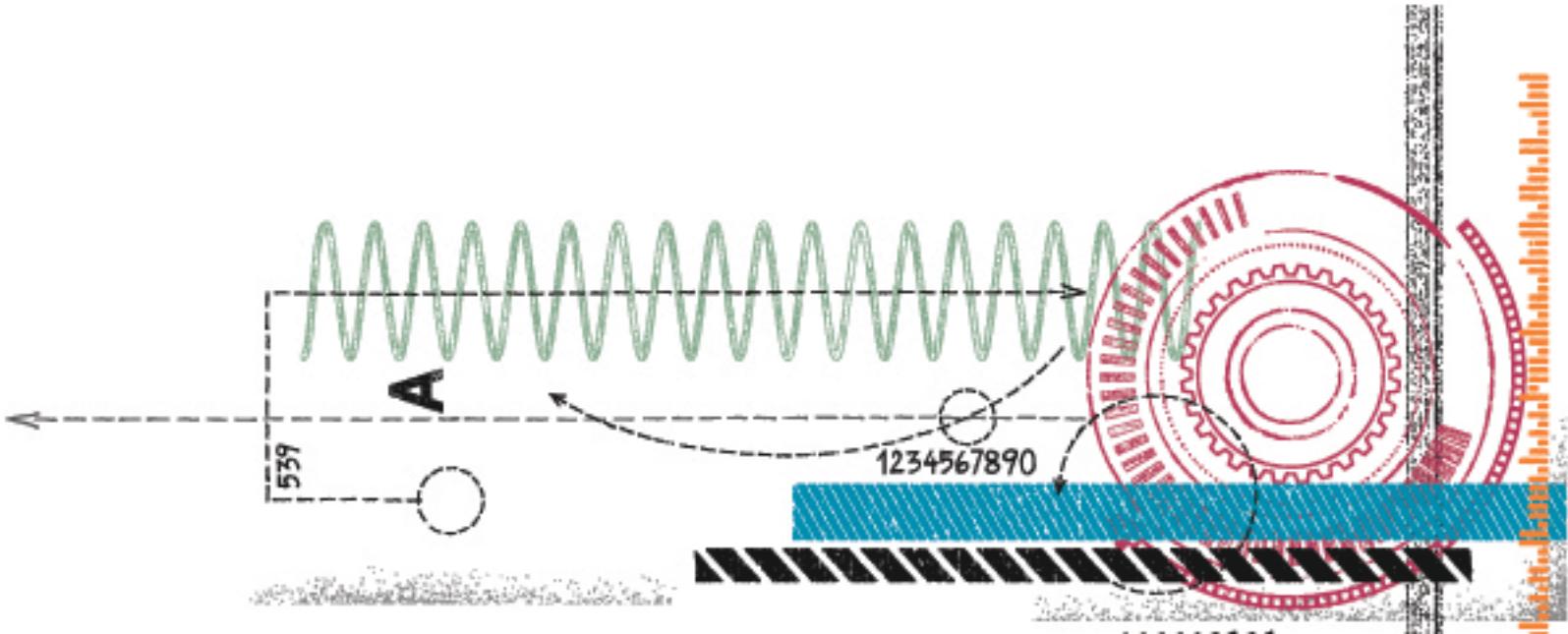


5. **Reform the way health services are purchased**. The problems associated with current funding practices, such as global allocation budgets for hospitals and fee-for-service payments that include inflation, have not yet been addressed in most provinces. The current system has allowed the benefits of productivity gains to accrue largely to providers, when at least some of those benefits should be returned to funders (i.e. governments) in the form of lower prices. By moving to a more sophisticated payment system for physicians, pharmacies, acute care, and chronic care, spending can be reduced, particularly in those areas where real costs are falling fastest. Alternative pricing models may also curtail the growth of inappropriate and often expensive procedures.

The recommendations in this report avoid areas like improved health promotion, the cost of wage settlements, and tighter management of existing processes, such as improved supply chain management. Most policy makers are well-aware of the challenges and opportunities available in these areas. A continued focus on them by policy makers is assumed. This report sketches out the next steps in a transformative agenda for the Canadian healthcare system.

This agenda does not rely on new revenues or any form of privatization to create a fiscally sustainable healthcare system. The proposals could all take place within the umbrella of the Canada Health Act and are consistent with its principles, which were identified as crucial to Canadians in the Romanow Report (Romanow 2002).

Discussions of new revenues or privatization would distract Canadian policy makers from tackling the main task of transforming health systems. Rather, the recommended reforms begin to treat healthcare as the high-tech industry it is and accept rapid change as a good thing for Canadians. Innovative service delivery models and new technology have already begun to lower costs. The next step will be to turn those lower costs into lower spending and to do so in a way that continues to improve quality and access to care for Canadians.



SECTION ONE

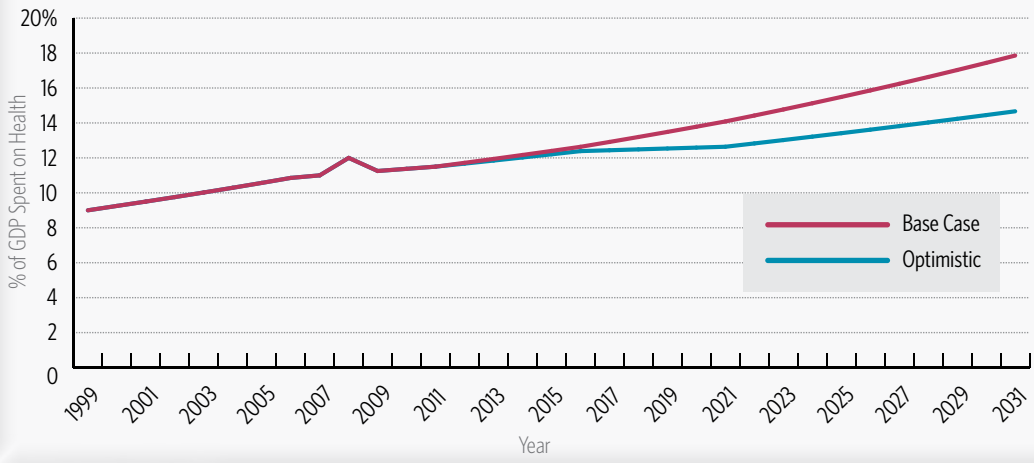
CURRENT CONTEXT & INTERNATIONAL PERSPECTIVE

WHERE IS CANADA HEADED?

Facing an unpredictable global economy, Canadian governments are under increasing pressure to reduce public spending wherever possible. At the same time, spending on healthcare has been rising at rates significantly above general inflation and significantly faster than government revenue growth. Canada's Parliamentary Budget Officer has noted that provinces will struggle to return to balanced budgets due to the pressures of healthcare spending (Parliamentary Budget Officer 2010, 20).

Trends show that over the last 25 years healthcare as a share of Canada's GDP has grown rapidly, from 7 per cent to 12 per cent, and will continue to grow, quite possibly to 19 per cent, by 2030 (see Figure 1). According to calculations by David Dodge and Richard Dion, healthcare expenditure has grown faster than nominal GDP by an average of 1.7 per cent per year since 1975 (Dodge and Dion 2011, 3).

FIGURE 1 Projected Healthcare Spending-to-GDP Ratio

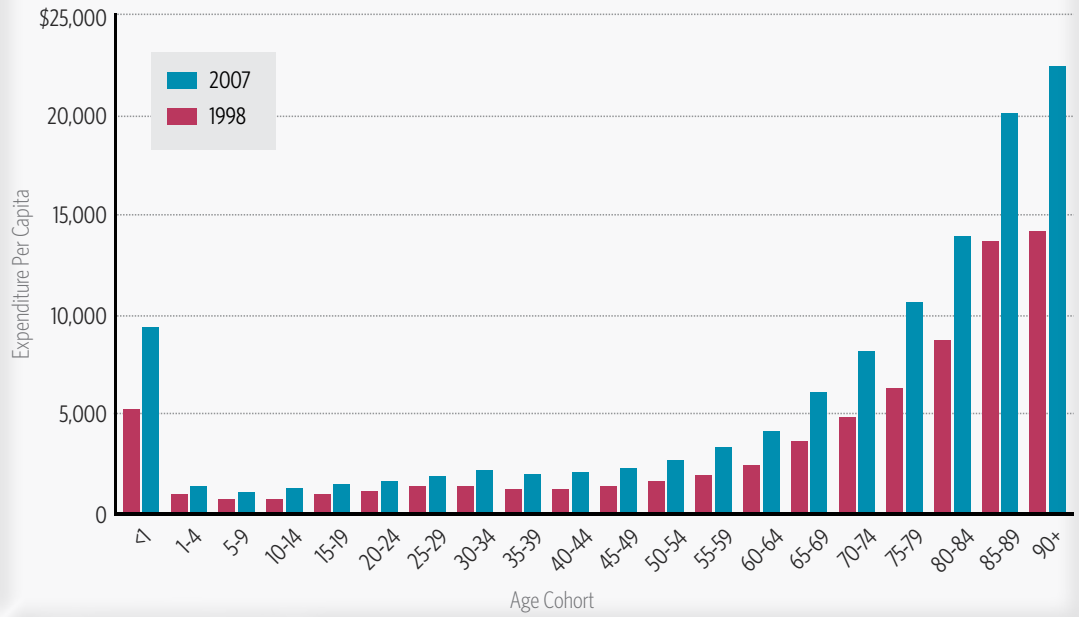


SOURCE: Dodge and Dion 2011

Projections suggest that this trend is set to continue as Canada's population ages and Canadians require increasing levels of care. Health expenditures increase dramatically for those aged 65 and up (see Figure 2) and their number is set to increase dramatically (Casey et al. 2003).

Don Drummond and Derek Burleton forecast that spending growth will continue at 6.5 per cent per year from 2010 to 2030, a rate 2.5 per cent above projected nominal GDP growth (Drummond and Burleton 2010, 14-15). Left unchecked, this growth would have serious negative consequences, including crowding out other government services, increased taxation of working-age people, increased spending by individuals for services currently funded by the provinces, and a decline in the quality of care.

FIGURE 2 Total Health Expenditures Per Capita & Per Age Cohort



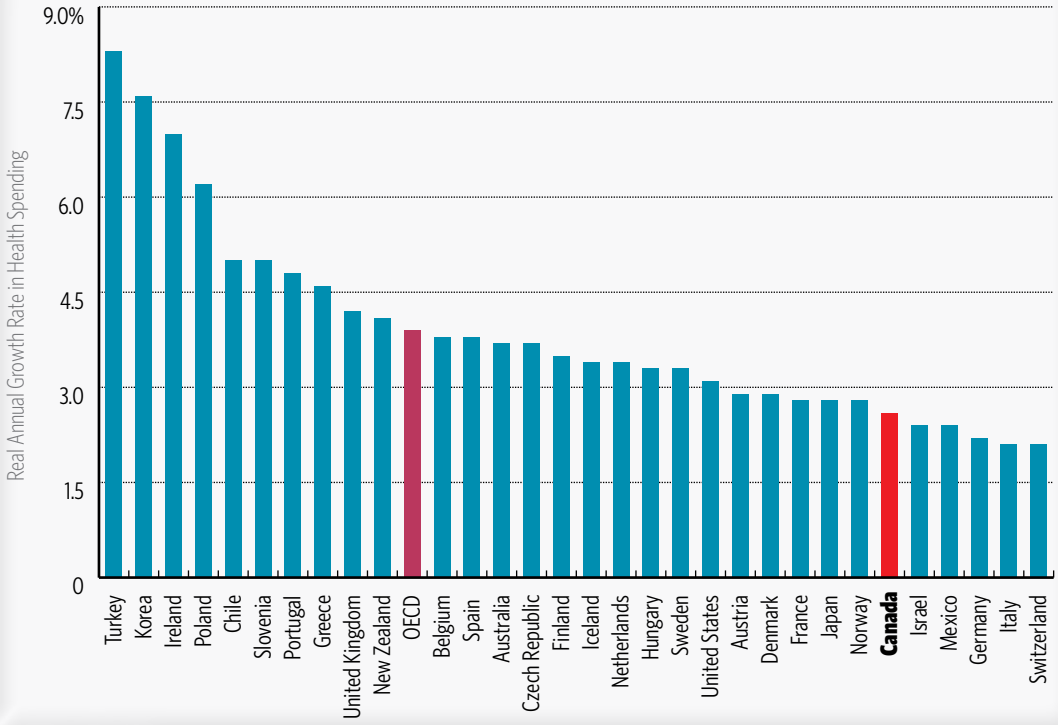
SOURCE: Drummond and Burleton 2010

TRENDS IN OECD COUNTRIES

These concerns are not unique to Canada. Across the Organisation for Economic Co-operation and Development (OECD), countries are grappling with increasing healthcare costs (see Figure 3). Healthcare spending could increase from an average of 7 per cent of GDP to between 10-13 per cent of GDP across the OECD by 2050 (see Figure 4) (OECD 2010, 33).

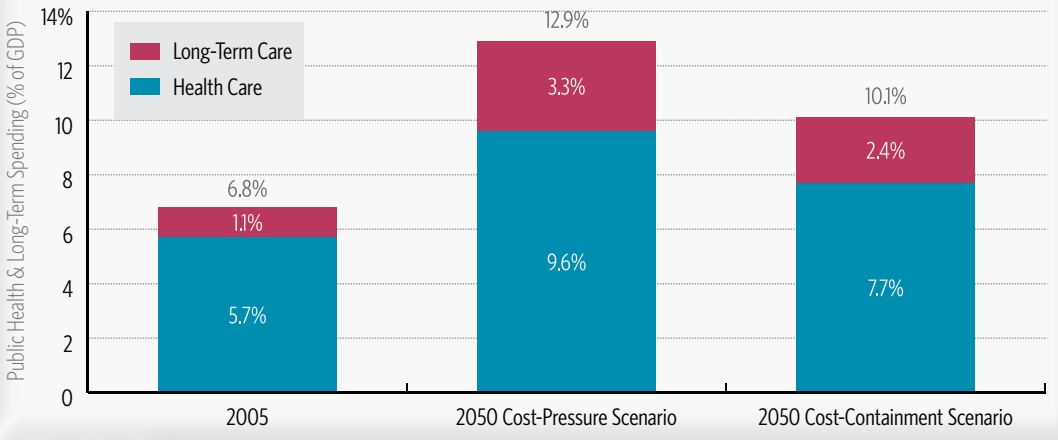
These projections of inevitable increases in health spending, for both Canada and the OECD, suggest urgent action needs to be taken or fiscal catastrophe will follow. Section 2 addresses the limits of using "straight-line" projections in the current context, while Section 3 discusses how the current system can respond to the spending challenges by embracing system transformation.

FIGURE 3 Annual Growth in Per Capita Health Expenditure, 1993 to 2008



SOURCE: OECD 2010

FIGURE 4 Projections of Public Health & Long-Term Care Spending, 1995 to 2050



SOURCE: OECD 2010

SECTION TWO

CURRENT STATUS & LESSONS FROM THE PAST

The challenges set out in Section 1 are substantial, but not insurmountable. In Ontario, both the Ontario Hospital Association (OHA) and the Ontario Medical Association (OMA) have proposed potential solutions that could significantly improve the sustainability of the healthcare system (OHA 2010; OMA 2010). After ten years of greater than 6 per cent growth in healthcare spending, Canadian providers find themselves well funded, physician salaries have been rising dramatically, and new technologies are in place thanks to substantial government investments.

By drawing on lessons from the past and harvesting cost-savings from recent investments in quality and access, policy makers can fundamentally transform Canada's healthcare system. ***It would be unfortunate, and a missed opportunity, if healthcare systems and healthcare bureaucracies emerge from this current period of fiscal adjustment unchanged—apart from doing somewhat less with a few fewer staff***. Labour shortages in many healthcare professional groups could make transformative change less threatening and these shortages create an opportunity for organized labour and professional associations to embrace these changes as fully engaged partners in change.

The challenge now is to recognize the major trends shaping healthcare and its economics, and to respond innovatively in ways that make patient care better and more accessible.

"STRAIGHT LINES OF DEATH"

"Straight line" projections based upon prior periods' data have their value and place in policy discussions. They are useful in projecting steady variables when there is a reasonable expectation that prior periods are representative of future trends.

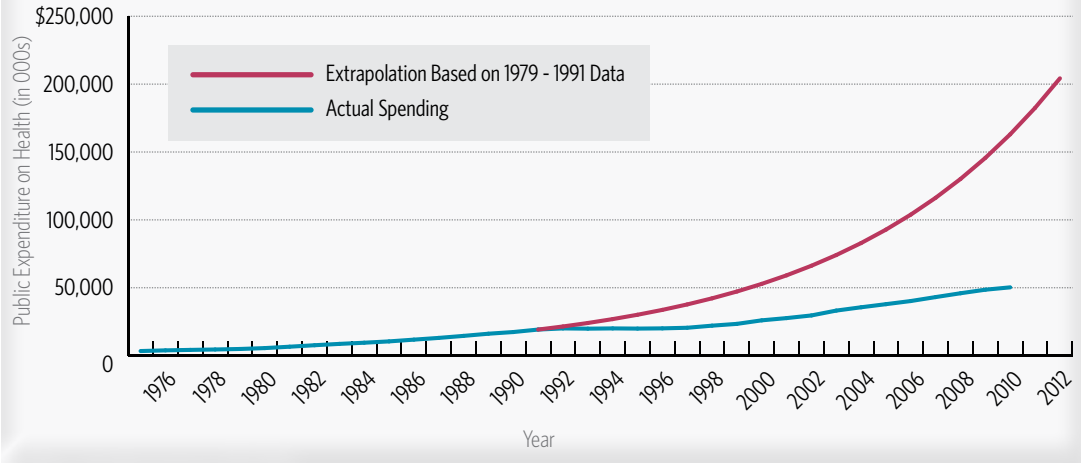
However, straight line projections for healthcare economics can result in serious miscalculations, and have done so in the past. Healthcare has a history of cyclical investments and retrenchment, with long periods of high growth followed by system restructuring and rationalization. Investments in new technologies during the high growth phase often create opportunities for efficiencies that are best realized in tighter economic conditions. Managers end up managing differently—not better or worse, but in a fundamentally altered manner.

To illustrate the point that straight line projections can fundamentally mislead it is useful to examine what a straight line projection from 1992

based on data from 1979 to 1991 would have looked like and compare the results to what actually happened (see Figure 5). From 1979 to 1991 in Ontario there was an average increase of 11.9 per cent a year in the health budget before the government shifted gears (CIHI 2010a). In fact, only once during this period did Ministry of Health (MOH) spending rise by less than 10 per cent annually. A 1992 straight line projection based on 1971-1991 expenditures would have concluded that the MOH would be spending over $200 billion in 2012. That is approximately four times greater than current spending and nearly twice the size of the total current Ontario government budget (CIHI 2010a; MOF 2011a). Health system actors at the time felt that healthcare would crowd out all the other public expenditures and that a publicly-funded system of healthcare was unsustainable.

Yet many leading commentators draw similarly neo-Malthusian "straight lines of death" today. Don Drummond and Derek Burleton identify four major drivers of healthcare spending growth that form the basis of these projections. First, healthcare costs rise as the general population grows. Secondly, healthcare costs also increase as the population ages. According to the authors, per capita spending on Ontarians aged over 65 is six times higher than for those under 65 years. Inflation in health services also tends to rise faster than general price inflation, increasing healthcare spending relative to other expenditure. Finally, utilization of health services tends to increase due to advances in technology, treatment decisions by physicians, the health of population, and the extent of insurance coverage (Drummond and Burleton 2010).

FIGURE 5 Actual vs. 1979 to 1991 Straight-Line Projected Health Expenditure



Authors' calculation based on CIHI 2010a

In their 2011 report, CD Howe authors David Dodge and Richard Dion project spending increases based on expenditure from 2000 to 2010. They project that "from 2012 to 2031, the annual growth of healthcare expenditures averages 6.4 per cent in the base case and 5.8 per cent in the optimistic case" (Dodge and Dion 2011, 10). They conclude, therefore, that "some combination of increased taxes, reduced public services other than healthcare, increased individual spending [...], or a degradation of publicly insured healthcare standards—longer queues, services of

poorer quality—is necessary to manage the growth in healthcare spending" (Dodge and Dion 2011, preface).

While it is true that *if prior trends continue* the system would be unsustainable, there is a fundamental error of interpretation at work here. The healthcare system is dynamic. Rather than concluding that the system is unsustainable, analysts should acknowledge that a fundamental technological shift has required increased investments over the past decade—but that other practices and processes in the healthcare system have not yet adjusted.

Until now, it has been easier to spend six per cent more per year than to make difficult decisions that may disrupt people's lives and job descriptions. At the same time, many of the system improvements that are needed for sustainability have already begun. We now should begin to capture the resultant cost-savings and ensure that other processes are adjusted to take advantage of the investments Canadian governments have been making.

A CLUTCH MOMENT
LESSONS FROM THE 1990s IN ONTARIO

A similar deviation from straight line projections—and a resulting healthcare transformation—occurred in the early 1990s in Ontario. Health sector productivity gains were in different areas than those of today, but that process of change is still worth examining.

During that period, the system experienced a "clutch moment"—a time of discontinuity during which the gears of government shifted dramatically, and prior assumptions were overthrown. It occurred quickly when the Ontario government ran out of operating funds in 1993.

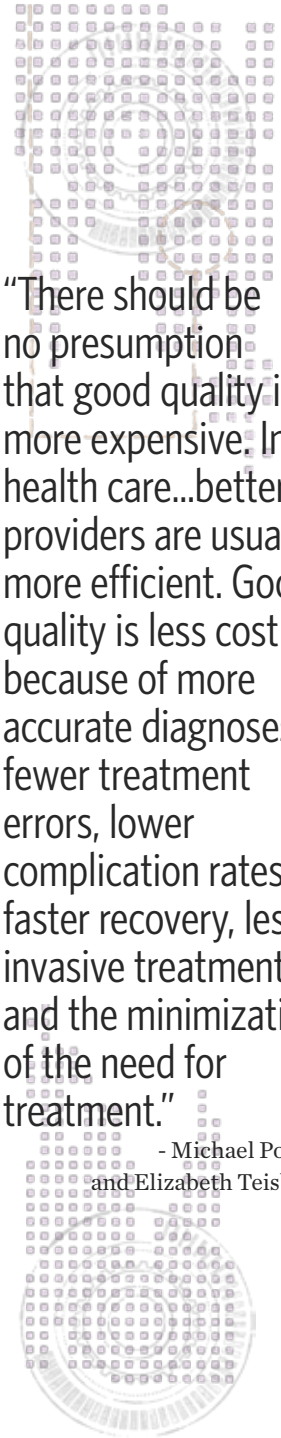
Michael Decter, Deputy Minister of Health at the time, describes a dinner the Deputy Minister of Finance and he had with bankers from Goldman Sachs. They needed to borrow $20 billion, but it became clear that borrowing even $15 billion would be nearly impossible (Decter 2010). From that point on, straight line projections based on the prior decade, with its 10 per cent spending increases and generous collective agreements, were irrelevant. The government was forced to consider options that had previously been unpalatable. Several cabinet ministers who had been labour negotiators ultimately supported the rewriting of collective agreements through legislation.

Excerpt from Michael Decter's Tales from the Back Room

When I mentioned the $15 billion a long and uncomfortable silence descended over the table. No one spoke. Finally Bob Hormats of Goldman Sachs spoke, "That would be uncharted territory for a non-sovereign borrower."

In plain language, no entity smaller than a nation had ever contemplated borrowing that sum of money in a single year. It was uncharted territory because no province or state or corporation had borrowed that much. Our hosts were far too polite to say it couldn't be done. They just said it had never been done. And they did not give us any reason to believe that this was a course that they would advise embarking upon.

Eleanor (Deputy Minister of Finance) and I silently agreed not to try the $20 billion number. There seemed little point. Even $15 billion was a risk beyond the Ontario's advisors at Goldman to contemplate. Clearly the Rae government needed a new budget plan. We returned home and delivered the news to the premier, finance minister and cabinet. We were not received as conquering heroes. The cabinet mood was just short of "shoot the messenger."



"There should be no presumption that good quality is more expensive. In health care...better providers are usually more efficient. Good quality is less costly because of more accurate diagnoses, fewer treatment errors, lower complication rates, faster recovery, less invasive treatment, and the minimization of the need for treatment."

- Michael Porter and Elizabeth Teisberg

From that moment, actual spending increased by less than 1 per cent per year for the next four years. As a percentage of GDP, healthcare spending declined through the entire decade.[1]

The recession of the early 1990s forced provincial governments to address the spending issue. Early reforms centred on reducing a few straightforward costs:

+ More detailed supply chain and group purchasing programs were introduced and/or expanded. Supply costs were managed tightly and substitutions of clinically equivalent supplies considered.
+ Shared centralized provision or procurement for clearly non-core services, such as laundry in hospitals, were introduced and/or expanded.
+ Wage and hiring freezes were combined with tougher bargaining positions.
+ Program reviews were undertaken to identify lower value services and programs for process redesign. Hospitals used these reviews to exit some clinical services that were viewed as non-strategic and to do some voluntary consolidations across hospitals.
+ Drug costs were curbed or reduced.
+ Some outsourcing, particularly in support areas such as housekeeping and biomedical engineering, was introduced.
+ Hard caps were implemented on physician salaries.

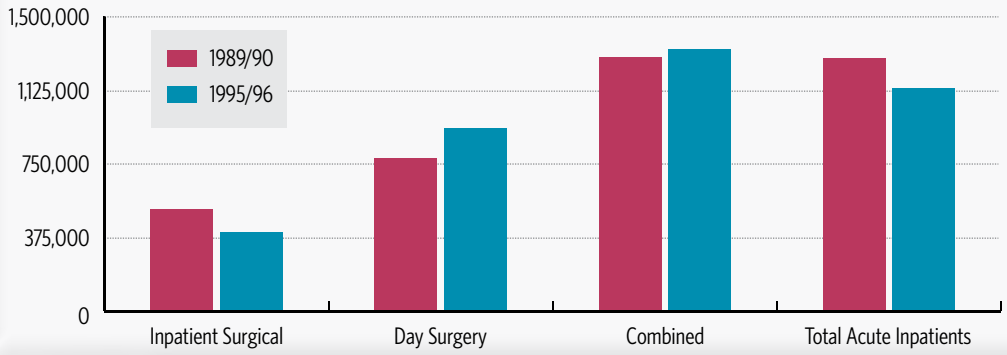
These measures not only saved a significant amount of money but also helped set the stage for a more comprehensive and fundamental transformation of healthcare delivery. In Ontario these early measures were greatly enhanced by forced furloughing of staff, which immediately reduced government costs while also putting the onus on hospitals and other institutions to find longer-term transformative savings on their own.

Early waves of investment had set the stage for the transformation that took place in the 1990s. One major change was the dramatic reduction of the size of the inpatient acute care sector with cuts to the number of inpatient beds and the consolidation of programs across institutions. This reduction was made possible by advances in health services technology during the previous decade, including less invasive surgical techniques. This made possible a rapid shift in terms of how and where care was delivered. In fact, leading institutions had already begun implementing these new technologies before spending reductions were mandated from above.

Simultaneously, scientific breakthroughs changed entire practice areas while dramatically improving patient experience. For example, after the discovery that gastric ulcers are caused by bacteria rather than diet and lifestyle, as was previously thought, ulcers went from being one of the most common reasons for surgical procedures to being largely treatable by antibiotics (NIH 1994).

Figure 6 illustrates the remarkable shift in this period from inpatient surgery toward day surgery and the decline in total acute inpatients. In the 1990s, hospitals dramatically reduced the number of inpatients present at any given time (Rochon 2011).

FIGURE 6 Comparison of Surgical Activity & Acute Separations, 1989/90 & 1995/96

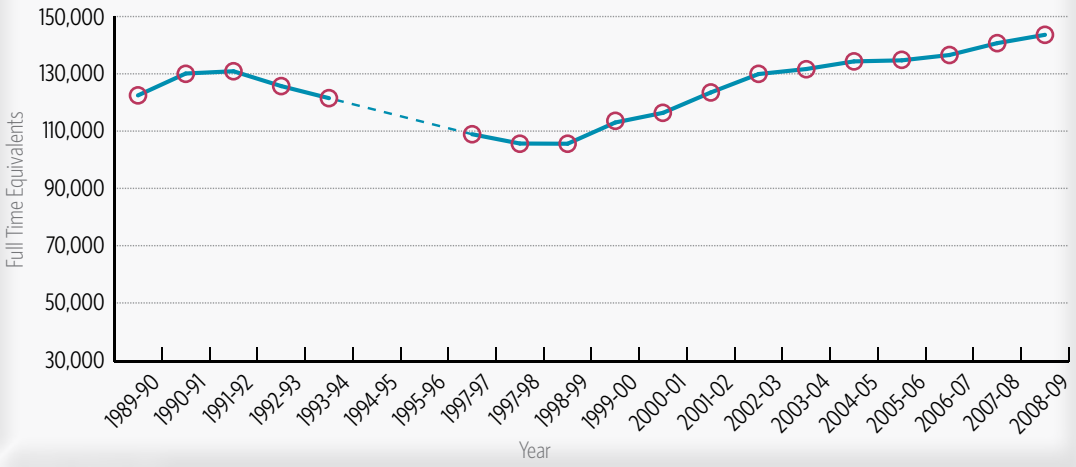


SOURCE: Rochon 2011

As restructuring proceeded across Canada, inpatient hospital days declined 12.6 per cent, from 23.3 million in 1995/6 to 20.4 million in 2003/4. Measured by hospital day beds per capita, this is a decline of 20 per cent. Ontario led the way with a 33 per cent decline, though every territory and province, with the exception of Alberta, experienced significant decreases (CIHI 2005, 6).

Technological changes created opportunities to rationalize the healthcare system. Few facilities actually closed, but new alliances, new consolidations, and repurposing emerged. This horizontal integration meant that excess beds could be removed from the system and that hospitals slow to adopt new methods could be forced to modernize.

FIGURE 7 Change in Hospital Employment



SOURCE: Rochon 2011

As Figure 7 demonstrates, these changes had implications for healthcare workers. Fewer beds meant fewer nurses and in Ontario the decline was dramatic. Nursing employment only returned to 1995/6 levels in 2003 (CIHI 2004; Rochon 2011). However, the expansion of ambulatory (i.e outpatient) and community care created new opportunities for nurses.

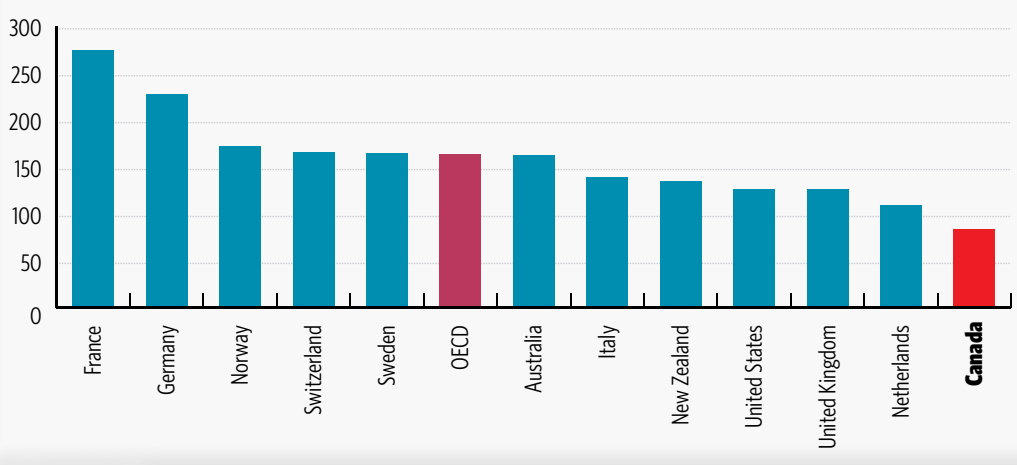
These healthcare reforms were effective in removing excess capacity and facilitating the transition to a new standard of outpatient practice. As Figure 8 shows, Canada performs remarkably well compared to its peers in reducing the inpatient population (Rochon 2011).

Restructuring in the 1990s left deep scars within the provider community and the damaged relationships were felt by patients whose faith in the system was undermined (Gandalf Group, 2009). Caregivers were either directly affected through loss of employment, or indirectly affected as they scrambled to plug holes created by sometimes ill-considered cuts which put access and quality at risk. To avoid these pitfalls today, healthcare professionals need to be full partners in the process of transformation.

This document does not pass any normative judgments on earlier periods of restructuring and cost adjustments. The case could be made that the cuts were too severe and led to access problems that subsequently needed to be addressed through wait time reduction initiatives. The important lesson policy makers should take from earlier periods is that investments in new processes can be costly, and it then takes transformative change across the system to harvest the savings that accrue from these investments.

The transformation process can in fact result in improved quality at reduced costs—the holy grail of public service transformation. As Porter and Teisberg have shown, higher quality often comes at a lower cost (Porter and Teisberg 2006). The same is true for better access. Given the investments of the past decade, we may be able to achieve this today.

FIGURE 8 Hospital Discharges per 1,000 Population as of 2007



SOURCE: Rochon 2011

The Revenue and Privatization Questions

Won't we inevitably need to find new revenue sources to meet the challenges of an aging population? Wouldn't creating a second tier of healthcare allow both new revenues and the introduction of private sector techniques? To each of these questions our answer is a firm "no." Neither revenue raising nor privatization will deal with the underlying issue of sustainability.

Raising revenue will not address the sustainability of the healthcare system even if it will reduce government deficits. By increasing taxation or introducing more user fees, we will do nothing to stabilize (and eventually shrink) the share of GDP spent on healthcare. Absent systemic transformation, total healthcare spending will continue to rise.

Privatization is not a necessary precondition to creating a sustainable healthcare system. If anything, it will transfer more of the burden of rising healthcare spending to individuals without reducing the percentage of GDP spent on healthcare. Instead, policy makers should focus on creating internal markets within the public system, which would create incentives for providers to continue to find new ways of delivering higher quality services at lower costs, with some of those cost savings passed onto governments.

There is no inevitable need to raise taxes or allow more care outside of the single payer public system. It is possible that at some point in the future additional options will be put on the table, but at this stage it is incumbent upon all governments to undertake the transformational change that should reduce growth costs in the current system, knowing that failure would require Canadian governments to consider less palatable options.

Regardless of one's views on the need for more revenue in the system, transformational ideas are worth pursuing. Those committed to raising revenues or moving toward for-profit care are encouraged to put aside those discussions and consider system transformation options which can both reduce costs and improve quality. Shifting Gears Health focuses on these microeconomic healthcare issues and leaves the questions of revenue raising and privatization to the macroeconomists already writing on the topic.

SOWING THE SEEDS FOR REFORMS IN THE 2010s

Healthcare spending is due for another correction. Much like in the 1990s, the "straight line" projections all show out-of-control healthcare spending crowding out all other government expenditures. As we did 20 years ago, we are approaching a "clutch moment" as we enter a period of healthcare system transformation. Shifting gears to an improved system will depend upon the infrastructure developed during the past decade to support access to care and quality care initiatives. The result could be continuous improvement in our healthcare system.

The challenges seem enormous, but we are lucky; the challenges of 2012 are much less daunting than those of 1992. The current spending growth rate based on 2001-2010 data is "only" 7 per cent and, in Ontario, the government has committed to curbing the growth rate to 3 per cent by using many of the methods of cost reduction that were pioneered in the 1990s, including supply chain audits and program review (CIHI 2010a; MOF 2011a).

However, when the gears shift, targets will become less important than transformational change. There are several environmental factors that should reduce the negative consequences of reform.

Low Nursing Unemployment

There is an acute nursing staff shortage and in 2005 Ontario alone needed to recruit 34 per cent of new nurses from other countries (Baumann et al. 2006). Labour conflicts are less likely in this situation because layoffs are far less likely.

A Decade of Technology Investments

Governments have invested heavily in electronic health agencies. As a result, Canada has a thriving virtual health industry that places Canada in a strong, internationally competitive position moving forward, with many of the initial capital costs already paid for. This point is expanded in Section 3.

Cost ≠ Spending

Cost refers to the resources in time and dollars a provider requires to produce a good or service
Price is the payment received from a payer for a good or service
Spending is price x volume

In healthcare, costs have been falling for providers in many areas as technology enables more efficient treatment, but price paid by payers has remained the same based on fee-for-service payments. In effect, efficiencies facilitate more volume and increase spending even as costs are dropping.

In several key areas, costs of providing services have diminished, though the government has continued to pay the same price

Some services and procedures are much less expensive and time-consuming to perform than they once were, with the result being that fee-for-service compensation systems have arbitrarily rewarded physicians who practice in areas where technology has improved most quickly. Policy makers can quickly reduce government spending by bringing prices (i.e. fee schedules) into line with actual cost trends. The government and OMA implicitly recognized this discrepancy in August 2011, when the OMA refunded $223 million in the final year of its fee accord with the government in a number of service areas, including: cataract surgery, endoscopy, and methadone labs (MOHLTC 2011a). Quite simply, the rate of growth of physician compensation has been too great and without a good principle-based rationale (see Table 1).

TABLE 1 Total Clinical Payments to Physicians in Ontario 1999-2000 to 2008-2009

FISCAL YEAR	CLINICAL PAYMENTS ($billions)	GROWTH RATE %
1999-2000	4.10	---
2000-2001	4.27	4.2
2001-2002	4.46	4.3
2002-2003	4.53	1.6
2003-2004	4.90	8.1
2004-2005	5.17	5.6
2005-2006	5.77	11.6
2006-2007	6.08	5.4
2007-2008	6.69	10.0
2008-2009	7.48	11.9

SOURCE: CIHI 2010b

Drug prices are also positioned for major reductions. If Ontario reforms to generic drug pricing and professional allowances were replicated across Canada, it is estimated that overall spending on generic drugs would drop by at least $1.28 billion annually (Law et al. 2011). Further savings are likely as several "blockbuster" drugs come off patent and are forced to compete with generic substitutes (Picard 2010).

Laboratory costs are ready for another round of cost reductions. The Ontario government has embarked upon a Medical Laboratory Services Review that could achieve a major cost reduction without adversely affecting services.

A decade of investment in access and quality

During the 2000s, yearly 6 per cent spending increases were sustainable so governments spent to develop infrastructure to measure and report on quality of care and access to care.

Lean Six Sigma

> "Can you ever be too busy for improvement? Frequently, I am rebuffed by people who say they are too busy and have no time for such activities... I make it a point to respond by telling people, look, you'll stop being busy either when you die or when the company goes bankrupt."
> – Shigeo Shingo, Toyota Production System

"Lean" focuses on eliminating any resource expenditure that does not add value to the customer experience. "Six Sigma" refers to a management strategy centred on removing the causes of defects or errors and minimizing variability in production systems. The concepts underlying Lean/Six Sigma have expanded from manufacturing to other markets that require constantly improving quality and efficient delivery.

The Thedacare hospital group in Wisconsin identified three principles to translate Lean to healthcare:

1. "**Focus** on patients, and design care around them"
2. "**Identify** value for the patient and get rid of everything else"
3. "**Minimize** time to treatment and through its course"

Lean techniques are now being applied to Ontario's healthcare system using metrics that are meaningful to everyone from CEOs to front-line care providers. In a project run by the Ministry of Health in Ontario, over 50 hospitals participated in a program with clear improvements in metrics linked to provincial funding:

- 10-50 per cent reductions in emergency department length of stay (ED LOS) for low acuity patients
- 5-25 per cent reductions in ED LOS for high acuity patients
- 5-15 per cent reductions in inpatient LOS for admitted patients

The application of Lean principles in healthcare will likely continue to improve outcomes globally.

Reforms focused on building on pre-existing quality infrastructure, including national and provincial health quality councils, the Canadian Institute for Health Information (CIHI), as well as distinguished academic centers across the country. Hospital boards and managers now measure and report quality using a balanced scorecard. Measurement and reporting have led to reductions in hospital infection rates, bed sore rates, and readmission rates, all of which have positive effects on quality and cost (Health Quality Ontario 2011). This new transparency and reporting will allow for more effective management of the system moving forward.

Emergency Department Performance Improvement Projects have been instituted in dozens of leading hospitals. This has created a culture of continuous improvement and deep knowledge in Canadian hospitals of Lean Six Sigma methods (see the textbox to the left).

Cancer surgery money and cardiac money were used to strengthen integrated cancer systems, such as Cancer Care Ontario (CCO) and the Cardiac Care Network (CCN). CCO has become an active and intelligent clinical services purchaser and quality monitor.

The 2004 federal Wait Times Reduction Fund provided $4.5 billion over six years and initiated an access-focused system transformation—especially in Ontario and British Columbia. By clearly identifying Canadians' reasonable expectations, the federal government created transparent and national standards for wait times for the "5 in 5" procedures: surgical (hips and knees, eyes, cancer, and cardiac) and diagnostic imaging (CT and MRI). Provinces were required to measure and improve wait times for these procedures.

+ When first Ontario and then BC expanded the program to include all surgeries, de facto national standards were created for surgical acute care. The Wait Times Initiative transformed the system by introducing system performance standards, measuring against those standards, and creating incentives for providers by attaching funds directly to the achievement of those standards (MOHLTC 2008). New, modern methods and facilities were introduced and prices (and costs) per procedure dropped. In some cases, outdated delivery models were shut down.

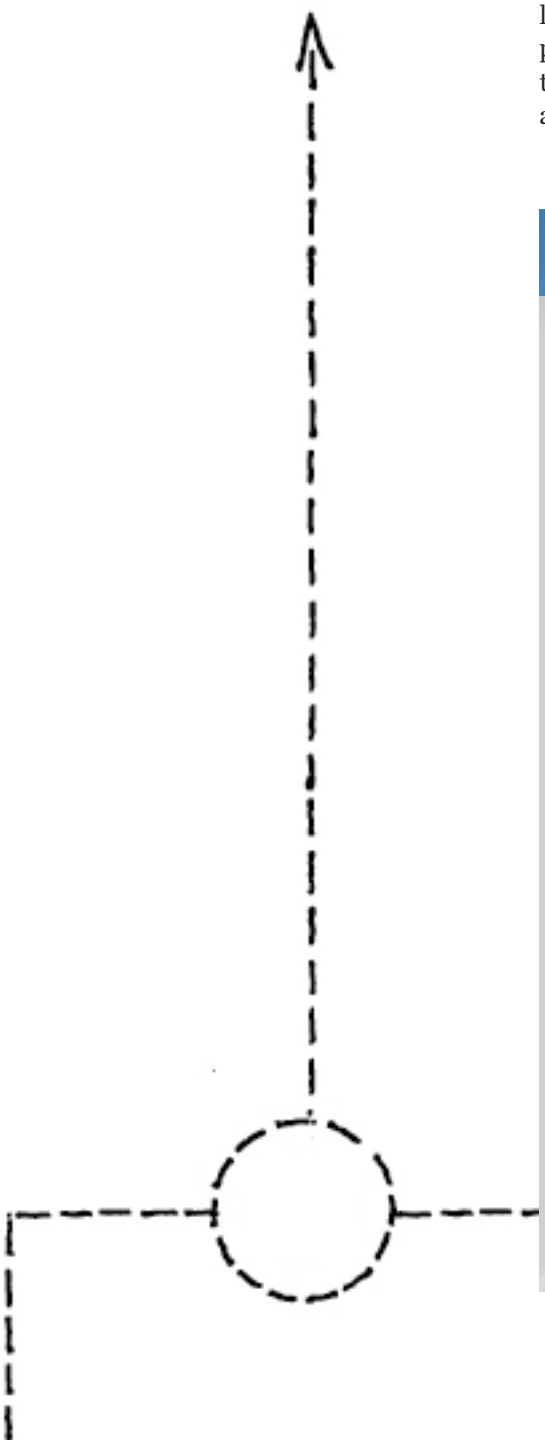
+ The Wait Times Initiative also included major investments in diagnostic imaging technology that substantially increased the volume of images processed (You et al. 2007).[2] The access gains were less consistent but huge efficiencies resulted from

technology improvements. Costs per unit of service dropped dramatically but prices have remained stubbornly high and supported growing incomes for radiologists.

There is currently no well-defined systematic process for harvesting the productivity improvements that result from past investments

As discussed further on, unit costs are collapsing in many areas, including surgeries, diagnostics, specific drugs and even hands-on patient care, yet spending continues to rise. Working with providers as partners in identifying a better way of sharing the savings and ensuring that the public purse also benefits are logical next steps.

Identifying areas where costs are declining is tricky in practice; sometimes initial investments inflate costs in the short-term while providers learn and adapt. But it is nonetheless essential to develop a systematic process to identify savings, communicate best practices in applying new technologies or processes, and document the improvements on quality and access.



Excellent Care for All Act, 2010

The Excellent Care for All Act (ECFAA) established new standards for high-quality patient care in Ontario since its enactment in June 2010. With ECFAA the Ontario government demonstrated a commitment to quality-based healthcare and responsiveness, transparency, and accountability to the public. The legislation expanded the role of Health Quality Ontario (HQO - formally the Ontario Health Quality Council) and mandated that healthcare organizations implement three key functions—quality committees, patient and staff satisfaction surveys, and a Quality Improvement Plan (QIP). The four core principles guiding ECFAA are:

1. Care is organized around the person to support their health
2. Quality and its continuous improvement is a critical goal across the healthcare system
3. Payment, policy, and planning support quality and efficient use of resources
4. Quality of care is supported by the best evidence and standards of care.

Under ECFAA, every healthcare organization must develop and share with the HQO a QIP, and link executive compensation to the achievement of targets established by a quality committee. A quality committee monitors service standards, makes recommendations on improvements, ensures capacity building of healthcare organizations' staff, and is informed by best practices and scientific evidence. It also oversees the preparation of the QIP and reports the results to the HQO.

The HQO is now working to monitor, report, and make recommendations on standards of care and the provision of funding for healthcare services and medical devices. A recent amalgamation with five other quality improvement organizations and programs has also been undertaken (MOHLTC 2011b).

SECTION THREE

TRANSFORMATIVE CHANGE FOR SUSTAINABILITY

FIVE AREAS OF INNOVATION

INTRODUCTION

TRANSFORMING HEALTHCARE BY REDEFINING THE CHALLENGE

Technological change is always affecting the healthcare system but we often fail to recognize it. A first step toward achieving savings is to recognize that healthcare is a high-tech innovative knowledge-based industry. Recognizing this has major implications for how the system should be managed.

The impacts of technological change are complex and difficult to untangle. As healthcare unit costs have fallen in many areas, spending has continued to rise. Policy makers can sometimes struggle to understand what is happening in the clinical arena and occasionally feel that the knowledge asymmetry is being used against them in funding negotiations. A few introductory observations make explicit some of the issues that need to be addressed:

+ Practice patterns are regularly changing in many areas of healthcare. Change is a constant and is often fast-paced.

+ Per unit costs often decrease—in some cases dramatically. Building CPI or other inflators into the fee structure is therefore not appropriate.

+ Increases in productivity often drive total system spending up because prices paid do not fall while the increasing productivity increases volume.

+ Fee-for-service payments have rewarded physicians most where technology has improved productivity quickly. In some cases, hospitals have not benefitted because of global funding.

+ Extending patient lifespan drives up system costs as acute conditions become chronic. Extending life is usually a good thing but it can be expensive and ways to manage costs or chronic conditions need to be explored.

In order to extract the benefits of productivity increases and to invest these savings thoughtfully policy makers need to see healthcare in a fundamentally new way—*as a fast-changing high-tech industry in which*

Collapsing Costs, Improving Outcomes!

Technological change has been improving outcomes and reducing costs for generations. For example:

- **Cataract surgery**: declining costs of 5-7 per cent a year since invention 60 years ago
- **Infectious disease burden**: decline by 5 per cent a year over most of the past century
- **Diagnostic imaging**: Infoway's 500 "virtual" radiologists and the tremendous growth in salary that followed
- **Brain surgery**: three major procedural areas all undergoing technological transformation
- **H.Pylori and gastric ulcers**: conversion of a disease from chronic to acute (and curable)
- **Osteosarcoma (and other cancers):** conversion of a disease from acute (and fatal) to chronic; in the short-term costs have risen, but savings may be found in the longer-term
- **Virtual patient visits** to US health provider Kaiser Permanente: resulting in 26 per cent reduction in physical visits
- **Virtual Home Care visits**: more than $5 in hospital costs have been avoided for every $1 invested
- **Joint surgery**: Where length-of-stay and operating room time continue to decline for less complex cases
- **Ontario Telemedicine Network's dermatology storefront**: virtual consultations remove the need for a visit to a specialist in simple cases
- **Retinal scans**: through changes to scope of practice and virtualization, simple scans can be read by optometrists rather than ophthalmologists

changing patterns of practice are expected, anticipated and managed to achieve higher productivity, all of which is in the interest of patients. The way in which physicians are paid must reflect this.

Four concepts should guide efforts to transform Canadian healthcare systems.

1. Use disruptive innovation as a framework to understand changes in technology and service delivery. The changes happening in the healthcare industry are similar to those taking place in other high technology industries: roles evolve, traditional models of care change, and regulations need reform (Christensen et al. 2009). These changes include the introduction of disruptive technology, evolution in business models, and the movement from intuitive to empirical to precision medicine (see Figure 9).

2. Recognize that Moore's Law—which suggests declining costs over time—applies to healthcare and recover productivity gains as they emerge for the public purse. In 1965, Gordon Moore observed that computing power—measured as transistors that could be put on a circuit for the same price—doubled every year (Moore 1965). Subsequent work has shown that the cost savings reduce price by about 6% a year and result in improved performance of about 14% a year (Computer Economics 2005). Moore's Law demonstrates how technological advances result in lower costs and improved performance at the same time. The same phenomenon is occurring in many healthcare services. In diagnostic imaging, cataract surgery, endoscopy, orthopaedics, and brain surgery, policy makers need to alter their models and expectations to reflect that per unit costs are declining rapidly. Otherwise, governments will continue to overpay.

3. Focus on improving quality and access as costs decline. High quality care is usually lower cost care (Porter and Teisberg 2006). Investments in access to care have improved systems and knowledge in ways that are reducing costs on a per unit basis. Not all improvements in access and quality reduce costs, but many do, particularly over the long-term. Strategies to reduce health spending could identify how processes that improve quality and access can also be designed to produce cost-savings.

4. Treat healthcare as a high-tech industry. High-tech industries require a flexible environment in which to operate. Actors have to be nimble but barriers to innovation prevent this from happening. Some of the reforms that could allow more innovation include:

a. "Getting the physical out of fee schedules." Our payment systems have an implicit assumption of physician contact and geography.

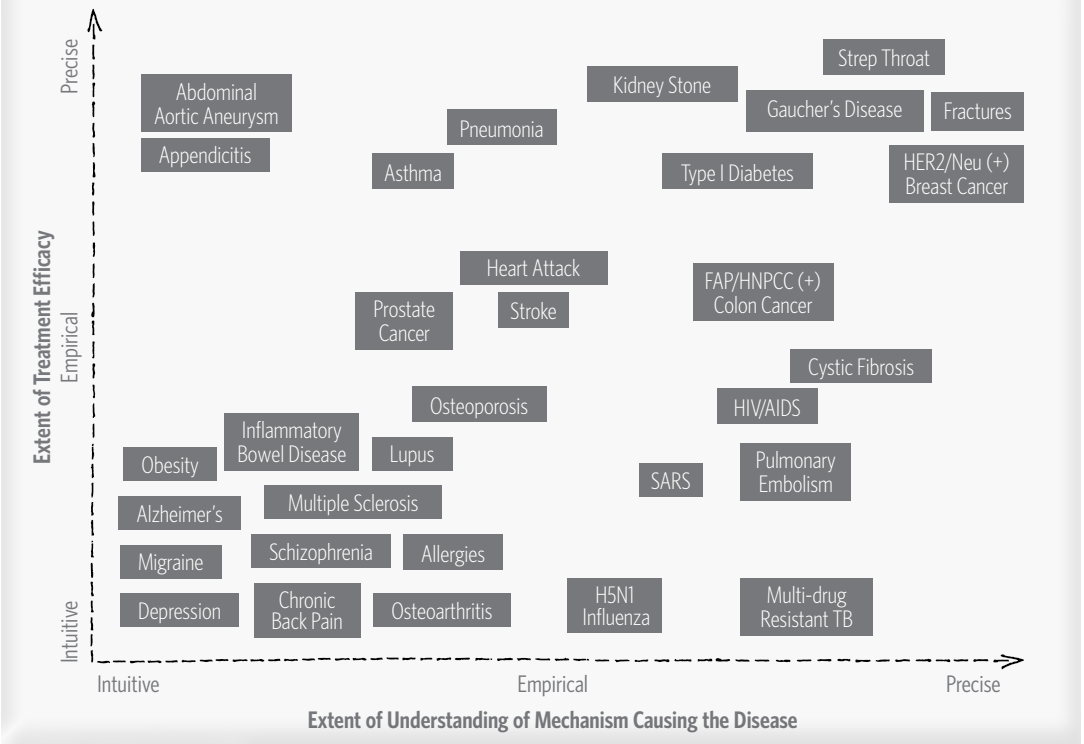
b. Create purchasers of care who are expert in buying, measuring, and pricing.

c. Improve the coordination of payments across and among "silos" that divide the patient care continuum.

d. Resolve regulatory challenges that prevent globalization of clinical skills and services.

These four themes can be deployed in a manner that recognizes that healthcare is constantly evolving and that this process can result in lower costs and improved outcomes as long as barriers to innovation are minimized.

FIGURE 9 Christensen et al.'s Current Map of Common Medical Conditions



SOURCE: Christensen et al. 2009

THE CHALLENGE OF SUSTAINABILITY IN 2012

Canada is approaching its new "clutch moment" in the healthcare system. Through innovation and transformation, it is possible to reduce the growth in healthcare spending without a decline in the quality or accessibility of services.

The four approaches discussed above can be deployed in five areas where transformational change could yield significant cost savings and contribute to the fiscal sustainability of the healthcare system:

+ **Modernize the organization of hospitals by disrupting clinical business models**
+ **Use virtualization to develop new roles for providers and patients**
+ **Widely deploy digitization in the second decade of Infoway**
+ **Devolve decision making selectively and where appropriate**
+ **Reform the way health services are purchased**

In each of these areas, it is possible that we can use new and emerging models of care and of declining unit costs in order to deliver high-quality accessible care, in a fiscally sustainable manner.

ACTION ONE

MODERNIZE THE ORGANIZATION OF HOSPITALS BY DISRUPTING CLINICAL BUSINESS MODELS

The sort of disruptive innovation needed to achieve sustainability in the healthcare system requires not only technological innovation, but also a business model to support transformative change. Technical and technological improvements have reduced costs for many health procedures. However, the existing business model has prevented those efficiencies from being translated into less expensive services (Christensen et al. 2009).

Business model innovation, when applied to healthcare, would encourage a shift from historic structures—hospitals and physicians—toward new models of care. A shift away from the general hospital would parallel the shift in the 1990s from inpatient to outpatient treatment. Existing institutions would be consciously disrupted in ways that could improve quality and access while reducing costs.

For example, the current "general hospital" is a mixture of three different kinds of services that could be more efficiently delivered if undertaken separately using three different business models:

+ Value-adding process (VAP) clinics where repeatable procedures can be done efficiently, reliably, and at a low cost (e.g. Kensington Eye Institute, where cataract surgeries are performed with low cost and high quality)
+ A solution shop where very knowledgeable, highly trained academic physicians diagnose and treat "intuitively" (e.g. The Hospital For Sick Children, where child psychiatrists treat serious cases of depression)
+ Facilitated networks where treatment for patients with acute conditions and/or chronic conditions can be coordinated effectively (e.g. Cancer Care Ontario, where patient treatments at VAP clinics and solutions shops are coordinated to improve quality and avoid duplication)

VALUE-ADDING PROCESSES

Clayton Christensen's *The Innovator's Prescription* (2009) applies well understood lessons from other industries to healthcare. Once a treatment or procedure becomes well enough understood and mastered, it becomes "precision medicine" and should be performed at a "value-adding process" clinic that focuses on delivering the required treatment. In the case of cataracts, this process was accelerated by the establishment and funding of VAP clinics like the Kensington Eye Institute.

Many other procedures have been moving out of hospitals to VAP clinics over the past two decades and are also achieving better outcomes and lower costs than general hospitals. These include Toronto's University Health Network (UHN)/General Electric Pathology project, Sunnybrook's Nurse Practitioner Colonoscopy service, the Shouldice Hospital for hernia repair in Toronto, and the Alberta Bone and Joint Institute.

Placing such processes outside of hospitals is often more convenient for patients and reduces overhead costs. Cataract surgery provides an excellent example of how technological development encourages improvements. Removing cataracts was a research intensive process that has now become a VAP clinic procedure in which access, patient experience, and lower costs are the focus. Cataract surgery costs have been dropping by about 5-7 per cent per year for more than fifty years as the procedure has steadily improved (Shapiro et al. 2001). Two surgeries are now being performed every hour.[3] Table 2 shows the reduction in inpatient nights and surgeons needed to complete the procedure as a result of standardization and systemization.

TABLE 2 The Declining Cost of Cataract Surgery

YEAR	1947	1952	1969	1972	1979	1985	1994	1998
INPATIENT NIGHTS	7	7	3	1	1 or outpatient	0 (outpatient)	0 (outpatient)	0 (outpatient)
SURGEON	N/A	N/A	1	1	1	0.8	0.7	0.5

SOURCE: Shapiro et al. 2001

When a procedure becomes "precision medicine," healthcare system managers should focus on reducing costs and improving access and quality. Governments have been insufficiently enthusiastic about identifying and supporting areas that should relocate to specialized clinics.

As Canadian governments redouble their efforts to bring down the growth in healthcare spending, efforts to shift capital spending to VAP clinics should be pursued. These specialized clinics could more efficiently serve the Canadian and eventually—with the right policy frameworks—the international market.

SOLUTION SHOPS

Before a particular service area matures and becomes "precision medicine" and a candidate for a VAP clinic, it is treated in the "Solution Shop." Much of academic medicine is set up in this way, with experienced clinicians puzzling through the difficult problems of "intuitive medicine." Cataract surgery evolved from a "Solution Shop" through relentless year by year improvements. This is a success and more and more procedures are becoming routine.

Osteosarcoma management is a good example of a condition that is still in the solution shop phase. By keeping sarcoma research and clinical management focused at the best academic centres, a disease that in 1980 was killing young adults has now become a still serious but managed chronic condition. In 1980, 80 per cent of patients had amputations and 90 per cent died within five years. Twenty years later, 90 per cent of patients avoided amputation and 75 per cent survived.[4] Further improvements are being made every year.

In the short run, solution shop success may add costs, but eventually an "empirical medicine" solution and then a repeatable "precision medicine" solution is developed, as it has for cataracts. Precision medicine is rules-based and can then often be moved to a VAP clinic and managed for better throughput, access, and quality, at lower costs.

Occasionally solution shops function as disruptive innovators in healthcare and completely change a disease and its treatment. A good recent example of this is gastric ulcers. In the late 1980s gastric ulcers were the number one procedure for general surgeons in downtown Toronto hospitals.[5] Dr. Barry Marshall and his associates believed that gastric ulcers were caused by bacteria called H. Pylori. In 1992, Dr. Marshall drank a beaker of H. Pylori, got a gastric ulcer, and then cured it with a course of antibiotic. After independent clinical trials, Marshall's conclusions were verified. What had been a terrible disease and a major expense saw treatment costs fall by more than 90 per cent. Gastric ulcers moved into the realm of precision medicine. A diagnosis results in a cure that can be easily and safely administered by a nurse (or a patient) under a doctor's indirect supervision. The cost implications of this example are profound.

Solution shops within academic centres also diagnose complex conditions. Solution shops as stand-alone diagnostic centres have not yet been clearly formalized for Canadian patients, except in children's hospitals and oncology care. US examples present a model where focused, relatively expensive but successful, diagnostic work-ups in solution shops evaluate a patient's health status, then treat and stabilize, before finally passing the patient either to a VAP hospital or a facilitated network.

This is the norm in cancer care in Canada. Every province now has a cancer agency that coordinates initial diagnosis and then assigns patients for treatment (often at VAP-like centres). Governments should consider how to extend this model to other diseases requiring complex diagnostic work-ups and understand that the payment structure should be designed to pay for time and material, but also support experimentation and innovation.

FACILITATED NETWORKS

Facilitated networks provide patient-centred care, manage the "solution shops" for diagnosis, then the VAP clinics for treatment, while empowering the patient as a vital part of the team. Features of successful facilitated networks include:

- A focus on the disease or condition, which is challenging because of the high level of comorbidities among patients.
- An interdisciplinary approach that cuts across almost all of the existing structures and systems.
- A bundled price that includes physician fees, acute care, continuing and home care, and a potential penalty if patients are readmitted to hospital within 30 days.
- Physician involvement and/or a nursing workaround roles which make up for the failings of the fee schedule to account for the time required to take care of patient needs.

Modernizing the healthcare system requires creating facilitated networks of care for patients with chronic needs, much like we have for cancer and cardiac care, and are developing for diabetes and chronic kidney disease. Identifying how best to organize, govern, and compensate facilitated networks will be a key test for governments when building systems for the 1 per cent of patients who account for 49 per cent of costs (OHA 2010).

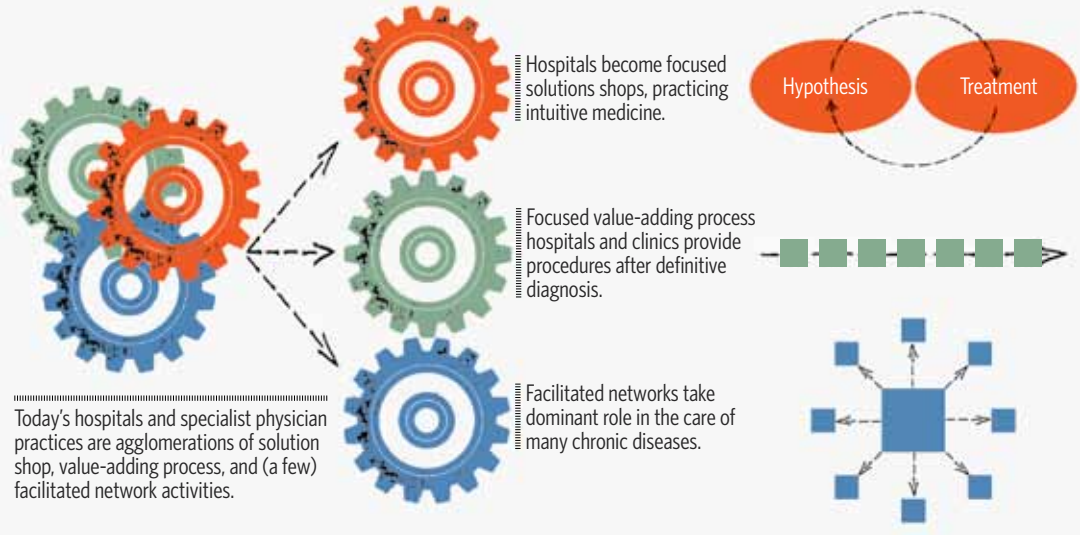
The OHA estimates in its paper *Bending the Cost Curve*, that major chronic illness accounts for $12 billion in expenditures. The use of facilitated networks could help reduce hospital readmission. If this could reduce major chronic illness spending by 10 per cent, $1.2 billion could be saved. Savings are also likely to be achieved in post-acute care for non-chronic conditions, although up-front investments are likely to produce short-term costs as new organizations are established, just as we saw with earlier waves of investment.

COST SAVINGS IN THE NEW MODEL

Cost savings should occur as we take a comprehensive view of the three parts of the general hospital and reorganize them as separate business models. Some short-term investments will likely be required, and careful analysis will be needed to assign specific functions. But even in the short-term, the savings that accrue from the establishment of more VAP clinics could partially fund the transition to new organizational models in the healthcare system.

Our expectations about how we receive healthcare within the public system would need to change under a new model. Many services delivered in solution shops would likely only be available in a relatively small number of centres with services for outlying areas provided through telemedicine facilities. These solution shops could be linked to large diagnostic hubs which would be organized internally based on a VAP model, and would be highly competitive on price and quality. Telepathology, laboratory medicine, and diagnostic imaging could all be moved to large VAPs controlled within the academic centers where accuracy and cutting edge diagnostics will be a competitive advantage internationally.

FIGURE 10 Christensen et al.'s Business Model Disruption in Healthcare



SOURCE: Christensen et al. 2009

VAP clinics, facilitated networks and solution shops may continue to share some common governance, including a common board, but savings are likely so long as each is given operational freedom to reduce overhead costs.

Capital allocation processes will need to consider how to encourage more efficient patient-friendly operations. The migration of some functions away from the hospital would have an immediate impact on hospital capital projects. Governments' focus on the bricks and mortar

of hospitals in their capital plans may inflate spending and produce poorer quality service for patients. The consequences of this new focus would be enormous. For example, ambulatory centres could be reconceptualised as true community hubs that leverage telemedicine to connect patients and providers virtually.

Several practical steps could move this agenda forward quickly:

1. Identify precision medicine areas that are candidates for VAP clinics and allow existing and new capital projects to include separate clinics
2. Accept the OMA's recommendation to allow more independent health facilities if they are established on VAP principles and under institutional quality assurance and appropriateness controls
3. Facilitate virtualization by removing the expectation that a patient must always physically visit a physician at a particular site when making funding decisions for capital projects
4. Expand the pilot projects on bundled pricing that are underway to encourage facilitated network developments. The current projects are "bundling" costs from across the continuum into a lump sum paid to a responsible provider who will help the patient navigate care.

The biggest challenge in disrupting the general hospital model will be labour dislocation. Implementing new models of care will change the jobs of nurses, allied health professionals, and doctors; if done properly, these changes could improve their professional lives while also alleviating labour shortages. The inevitable result of modernizing administrative structures is a redefinition of roles and responsibilities.

Similar disruptive shifts in the business models of physicians are also predicted by Christensen et al. VAP models will see nurse practitioners disrupting primary care physicians as predictive medicine advances, networks of providers will disrupt solo physicians in facilitated networks and, over time, solution shops will see primary care physicians disrupting specialty care as they have started to do in areas such as diabetes and mental health. These changes in roles and responsibilities and others are covered in the next section.

TABLE 3 Summary of Recommendations

CONCEPT	ACTIONS
USE DISRUPTIVE INNOVATION FRAMEWORK	• Recognize the separate business models that exist within the general hospital and the physician's practice • Identify emerging precision medicine areas
APPLY MOORE'S LAW TO HEALTHCARE	• Recover productivity gains from public investments by reducing prices on highly-efficient VAP procedures
IMPROVE ACCESS AND QUALITY AS COSTS DECLINE	• Improve the quality of chronic care treatment through facilitated networks to avoid hospital re-admission • Encourage creation and expansion of VAP clinics to provide high-quality, high volume procedures at low cost
TREAT HEALTHCARE AS A HIGH-TECH INDUSTRY	• Provide fee-for-outcome funding for VAP clinics, bundled prices for facilitated networks • Modernize capital allocation to support the three delivery models • Remove the requirement for physical contact from the fee schedule

ACTION TWO

USE VIRTUALIZATION TO DEVELOP NEW ROLES FOR PROVIDERS & PATIENTS

The virtualization of healthcare delivery (V-Health) has the potential to significantly improve health outcomes, quality, and access, while reducing spending. V-Health refers to care delivered remotely using information and communications technology, from a simple telephone call to robot-assisted telesurgery. Virtualization is reshaping many areas of healthcare, including primary care, home care, diagnostics, and pharmaceuticals.

Virtualization is also beginning to transform how providers and patients monitor and manage care. It is now incumbent upon governments to fully embrace this technological change and the reality of healthcare as a high-tech industry by adopting appropriate management, organizational, and payment frameworks within Canada's public system.

VIRTUALIZATION OF HEALTH DELIVERY (*V-HEALTH*) IN PRIMARY CARE

Relatively simple information and communication technology is an important part of making primary care systems work well. As a first step, physicians and other care providers need to be able to use the telephone

and email as part of their daily clinical business, and be compensated accordingly. Yet the fee schedules and regulations often discourage the use of these common-place technological innovations. Kaiser Permanente, an American healthcare provider, recently reduced the number of primary care visits by 26 per cent through a pilot project that allowed email and telephones to be used for "virtual visits" (McCarthy et al. 2009).

A major obstacle to broadening the scope of virtual health services is the system's current primary reimbursement protocol; only actual face time with a provider in the patient's own province is reimbursed. If clinicians could perform, and be reimbursed for, virtual consultations, the throughput for primary care would increase and waitlists should decline.

There are legitimate concerns about encouraging virtual treatment. From a fiscal perspective, some are concerned about an explosion of visit volumes and therefore increased spending. These concerns would need to be managed through approaches such as funding health teams on a per patient basis.

Virtualization is facilitating primary care funding reforms. The move to capitated (fee-per-patient) team-based practices, such as the Family Health Teams (FHTs) in Ontario, has shown that building care around a professional team can significantly improve patient access and outcomes. E-mail communication and phone calls can facilitate the focus on the overall health of the patient, including health promotion and disease prevention, which may reduce emergency room visits. Ontario is a leader in this regard, with physicians increasingly members of FHTs, which has contributed to slowing the growth of spending.

More modern and flexible scope of practice regulation that establishes what actions and procedures can be done by a licensed practitioner can interact with virtualization to deliver less costly care. Precision medicine is encouraging an expansion of the scope of practice for nurses, and V-Health will further accelerate this trend as patients see the most appropriate practitioner during various stages of a visit. For example, retinal exams could be screened by an optometrist before some are sent to ophthalmologists through telemedicine networks for assessment. Better defined diagnostic and treatment protocols can allow a lower-cost skilled practitioner to deliver care. Incentives and audits to ensure the right mix of professionals are performing various functions are increasingly being used globally.

This trend could be encouraged by policy makers by allowing price competition among providers within FHTs. Over time, governments could look to harvest the gains from using lower-cost resources by reducing payment levels. Such an evolution would be extremely threatening to physicians who have chosen to remain sole practitioners because they are less economically viable, although fewer young physicians are making this choice.

V-Health Innovators

CSII Telesurgery

The Centre for Surgical Invention and Innovation (CSII) at St Joseph's Health System in Hamilton is pioneering remote robotic-assisted telesurgery and surgical telementoring. Since 2003, 23 telesurgeries have been performed in North Bay from Hamilton and the center is currently providing live video mentoring for 50-100 surgeries a year. Next generation equipment will allow increased surgical volumes, but according to Dr. Mehran Anvari, Scientific Director and CEO of CSII, regulatory barriers remain: "I have not received one dime of payment for the surgeries performed remotely. There is no fee schedule code. I do it as a labour of love but I can't ask other surgeons to do it." However, Dr. Anvari predicts that within ten years almost every operation done in a community hospital can be done remotely: "Certainly most gastroenterology and gynaecology; even many cardiac and neurological procedures will become possible as the technology advances."

PharmaTrust

The PharmaTrust MedCentre™ is a remote pharmacy dispensing technology that allows a patient to use a touch screen, insert a prescription, and speak with a pharmacist through two-way video technology. There are currently fifteen sites operating with their third generation machines in Ontario including at the Curve Lake First Nation Territory; PharmaTrust also has one site in unit testing in the UK and there are targeted sites in the US. PharmaTrust is an example of a "good-enough" disruptive technology. A virtual pharmacy is not an actual pharmacist but if they are available when the actual person is not, they are quite capable of dispensing drugs. The introduction of these machines should improve access while driving down supply chain costs.

UHN Telepathology

"As is your pathology, so goes your clinical care."
- Sir William Osler, 1890

The Laboratory Medicine Program (LMP) at the University Health Network provides laboratory testing and diagnostic services to over 150 hospitals across Canada and telepathology is taking UHN global. Virtualization of the specimen images allows the very best experts to read and review the specimen from anywhere in the world. UHN is currently involved in a telepathology project with support from the Ministry of Health, Canada Health Infoway (CHI) and the Province of Ontario to establish a telepathology network that will enable UHN, Manitoba and Newfoundland and Labrador to establish a pathology service network. According to LMP Executive Director Brad Davis, "telepathology is where medical imaging was 10 years ago and the global market for telepathology is projected to exceed $3 billion by 2020." With UHN leading the way, telepathology creates real opportunity to create knowledge economy jobs in Canada while improving quality and access.

Ontario Telemedicine Network (OTN)

Ontario Telemedicine Network uses two-way videoconferencing to enable patient-provider and provider-provider communication in every Ontario hospital and many healthcare locations. For example, OTN has developed a "Store Forward" program that allows a health practitioner to take a digital picture of a skin condition and conduct a virtual consultation with a specialist. A family doctor could provide permission to view a skin condition to a handful of trusted dermatologists, with the first available specialist receiving payment for the consultation. This is an example of asynchronous diagnosis where the patient and provider do not need to be in the same place at the same time. This improves access to specialists by avoiding a patient trip to the dermatologist and reducing wait times for results. Other OTN programs include telehomecare, remote consultation through two-way video conferencing, and tele-emergency consultation. These programs have already been effective in reducing costs by avoiding patient and provider travel, avoiding infection, and reducing re-admittance to hospitals.

INNOVATIVE V-HEALTH PROVIDERS

The potential for V-Health extends far beyond primary care. The theory of disruptive innovation suggests that radical change often begins among marginal or marginalized groups. Recent innovations have focused on bringing V-Health to underserved rural and remote communities. In the short-term, these innovations may have increased costs, but the productivity benefits are now ready to be recaptured for reduced spending.

These new innovative groups include the Telesurgery team at St. Joseph's Health System, Pharmatrust, UHN/GE Telepathology hub and the Ontario Telemedicine Network (see textbox).

These virtual services were initially "good enough" for people who did not have access to large hospitals in urban centres. However, continuous improvement means that now mainstream users are beginning to prefer virtual healthcare delivery. Policy makers should encourage this disruption so that V-Health grows to account for an increasingly large share of clinical services, including diagnostics, routine monitoring, routine visits, and prescription renewal. V-Health could also include very high end specialty consultations with Solution Shops as well as remote surgery and procedures requiring fine, machine-assisted operations. All of these changes will expand policy makers' options for organizing networks, VAP clinics, and solution shops.

Virtual health services also create the potential for competition around quality. Once location is not an issue, the lab that will process the specimens or the radiologist who will interpret the scans can be chosen based on lowest cost and best quality. There will still be local physicians and surgeons, but if a region can purchase other types of care from providers based elsewhere, these providers can both plug gaps and provide needed competition. High-quality, lower cost providers will have incentives to increase their volumes and scale up their clinical business.

Delocalization means that VAP clinics can reach scale without ever having to move patients to an actual physical facility. This is already happening with telepathology as it happened with diagnostic imaging in the last decade. Patients in over 150 hospitals across Canada are having their cancer pathologies remotely analyzed by professionals in Toronto. This skilled and efficient professionalization could form the start of a highly-competitive high-tech cluster if Canada wishes to permit the export of virtual healthcare services.

V-Health providers are discovering new benefits from virtualization as disruptive innovation gains scale and scope.[6] Some of these benefits appear to include:

+ Reduced travel and wait times for patients (and providers). When patients receive consultations virtually, specialists do not need to travel to remote communities as often.

+ Reduced costs. The entire OTN program is less expensive than the travel grants avoided for northern healthcare.

+ Elimination of "politeness time." This refers to a specialist's ability to diagnose immediately without spending time on small talk.
+ Ability to aggregate volumes and organize processes better. This can mean substituting lower cost care providers or using manufacturing techniques to ensure quality.
+ Asynchronous diagnosis, where provider and patient are not present at the same location at the same time, using "Store-Forward" in areas such as dermatology.
+ Substantial avoidance of greenhouse gases.
+ Lower infection rates and improved infection control when sick and well patients can be kept physically separate.

The fundamental changes caused by disruptive innovation will yield more benefits as V-Health matures. What started as a marginal system for underserved rural and remote communities is becoming an integral part of how providers deliver the right care by the right provider to the patient wherever they are.

ACCREDITATION & HEALTHCARE FOR EXPORT

The virtualization of healthcare takes place against an even more radical disruption of healthcare globally. Put simply, high quality expertise is increasingly clustering in a smaller number of global cities, and these clusters of world leaders are providing services for export. Canada, Ontario, and Toronto could emerge as world leaders in the provision of health services remotely. One opportunity is to set the standard on international accreditation. With Bill 179, Ontario has become a leader in credentialing and expanding the scope of practice for healthcare professionals (Legislative Assembly of Ontario 2009).

The globalization of clinical credentialing standards is important for healthcare system sustainability. The old notion of local providers is quickly breaking down. In the near future "health value" in terms of quality, cost, and access will be internationally measured. With Canada's leadership in V-Health and supportive clinical immigration policy, policy makers can support the development of a knowledge economy based on Canadian standards of care and Canadian practice guidelines. Given Ontario's leadership on credential reform, it is conceivable that Ontario policies could form the basis for global standards that would support the internationalization of healthcare. Canada's proximity to the US means that providers have access to a very large healthcare market that also has the highest costs in the world and is looking for lower-cost high quality options. Canada's innovative virtual health delivery systems could expand beyond serving Canadians:

+ Diagnostic centres at places like UHN could combine pathology, laboratory, genomics, and diagnostic imaging to provide high-quality and low-cost services internationally.

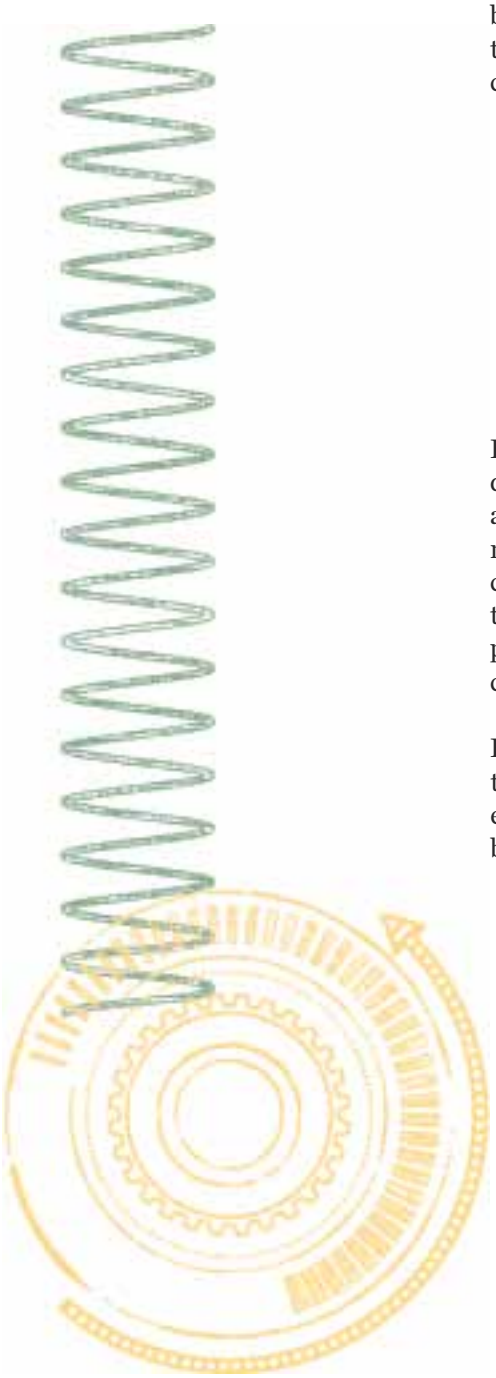
- Virtual pharmacists and nurses could be located in large call centers. Linked by high-tech equipment and with access to the best treatment protocols and advice these clinical call centers could provide fee-for-service consultation anywhere in the world.
- Telesurgeons, who are able to perform operations over long distances using robotics, will be able to deploy their expertise in remote or underserved areas. By consolidating volumes in centres of excellence, costs can be reduced while quality and access improved.

Some are concerned that provision of services for an export market would divert resources from Canadians. This is a concern that should be taken seriously but one that can be managed. A simple expansion of the existing wait times standard to include a "Wait Times Plus" standard could answer this need:

> *"No facility will be allowed to serve export markets until their region (or LHIN) has met and exceeded the published wait times plus standard." For example, where the existing standard for hip and knee replacement is 90 per cent of patients at 26 weeks the WTP standard could be 99 per cent at 13 weeks. Exceeding the standard would give a hospital the choice to serve patients from outside its region, the province or the country."*

Benefits for the system should be expected. Policy makers would see direct benefits from spreading fixed overheads across larger volumes and indirect benefits from gaining better pricing information as international prices are tracked. Institutions that gain scale advantage and create new clinical business models would provide higher quality care to both Canadian and foreign patients. Most importantly, Canadian patients would need to see a second dramatic improvement in access to care as a precondition to the opening of export markets.

How policy makers manage this opportunity—which is both an opportunity for alternative revenue streams for the healthcare system and an economic opportunity to be a global leader in a high-tech industry—will be an enormous policy, political and communications challenge.



CARE MANAGEMENT ROLES FOR PROVIDERS AND PATIENTS

Virtualization is also streamlining roles and responsibilities for patients and providers. In most cases, a patient with a chronic disease or the patient's family member is responsible for scheduling lab tests if he or she is well enough to be at home. Because some patients struggle to manage their diseases well, this structure can lead to acute problems and expensive hospital readmission.

Virtualization allows the burden of managing a patient's disease to evolve from the patient's responsibility alone to include the participation of a clinical or support person who is specifically trained, equipped, and focused on managing the disease.

Innovative solutions to improve outpatient management include Ontario Telemedicine Network (OTN). Such programs identify patients with chronic disease comorbidities who are likely to be readmitted to hospital within thirty days of discharge. These programs subsequently track their care, offer them health coaches, and identify when exacerbations of existing conditions are most likely and try to prevent them. For patients in OTN's program, hospital admissions dropped 65 per cent, emergency room visits dropped 72 per cent, and walk-in clinic visits dropped 95 per cent (Ontario Telemedicine Network).

Policy makers' understanding of these new models and approaches is growing all the time. Expanding their application across an even broader range of practice areas should be one of the defining features of the coming wave of transformation.

Patient self-management, which allows people to participate proactively in the continuum of their care, is another promising development. PatientsLikeMe, for example, is an online data sharing forum where patients can create a profile of their current condition, treatments and outcomes; the website uses the resulting data to improve products, services, and care for patients in real time (Mansell 2011). This shifts the responsibility of data collection from producers and regulatory bodies to the end users of services—who have the greatest vested interest in success and are often happy to take on this responsibility. Policy makers should be asking how these emerging social media tools can be used to improve quality and reduce costs.

Patient Navigation

Patient navigation refers to two key roles that can reduce costs by avoiding unnecessary hospital readmissions: 1) Patients with a high likelihood of being readmitted to hospital are monitored in their homes so that healthcare professionals can proactively address potential problems before they become acute; 2) Facilitators assist patients in securing and coordinating the services and resources they need to manage their care more effectively.

How this is achieved depends on the patient's condition. Patient navigators help post-acute patients make educated treatment decisions and help connect them with community resources for post-treatment support. For those with chronic conditions, patient navigators set up equipment to allow daily monitoring of the patient's condition and activate treatment options when problems are identified. Cancer Care Ontario has had patient navigator roles in place for years.

The OHA's Bending the Cost Curve estimates cost savings from preventing trips to the emergency department, reduction in palliation costs, and reduced wait times as potential benefits from patient navigation. Major savings would accrue from avoided hospital readmissions and the reduced need for other services including drugs, physicians, acute care, and other healthcare costs. The OHA says that this could be $1.2 billion for every ten per cent reduction in expenditures of chronic care.

TABLE 4 Summary of Recommendations

CONCEPT	ACTIONS
USE DISRUPTIVE INNOVATION FRAMEWORK	• Identify and support disruptive V-Health companies serving marginal(ized) groups
APPLY MOORE'S LAW TO HEALTHCARE	• Encourage price competition among mature V-Health providers to reduce spending and grow the Canadian V-Health industry
IMPROVE ACCESS AND QUALITY AS COSTS DECLINE	• Permit virtual visits to allow better access to care. This may reduce costs through avoided trips to the doctor or emergency room • Encourage primary care group practices and the use of lower cost resources • Encourage virtualization to treat and diagnose without unnecessary travel costs
TREAT HEALTHCARE AS A HIGH-TECH INDUSTRY	• Allow and encourage virtual visits to primary care practitioners by funding them appropriately • Fund virtual patient navigation systems and pilots for chronic care • Support internationalization of credentials and allow virtual healthcare exporting

ACTION THREE

WIDELY DEPLOY DIGITIZATION IN THE SECOND DECADE OF INFOWAY

Since 2001 and the creation of Canada Health Infoway, the federal government's Health IT agency, governments across Canada have invested heavily in new healthcare technology and electronic health records. Policy makers understood that there was a clear role for government in the early days of the nascent industry and that new information capital investments could increase the quality, efficiency and long-term sustainability of the system—and that these were beyond the scope of individual healthcare providers.

Infoway and the provincial eHealth agencies have deployed capital to targeted domains such as diagnostic imaging, laboratory, and drug information systems and created entirely new infrastructure layers for physicians, hospitals, and the healthcare system. Governments' support of new industries can go through three stages:

+ **Stage 1:** Subsidizing the foundation of the industry.
+ **Stage 2:** Stabilizing and strengthening the companies involved, ensuring fair and equal access to their products, and services and assuring that their products are safe and effective.

+ **Stage 3:** Encouraging competition to reduce prices (Christensen et al. 2009).

Infoway and the Health IT industry in Canada have moved through stage one successfully and are now in stage two—the stabilizing and strengthening stage. The fast pace of new technology development and the emergence of virtual healthcare make it likely that we will move quickly into stage three. Policy makers face difficult decisions about how best to realize the dream of digitized healthcare and the electronic health record.

In stage two, with a well-capitalized health IT industry and many strong private and public sector corporations, governments can shift the focus of their investments toward the needs of a maturing industry, namely, supporting providers and patients. Hospitals, doctors, nurses, and others will make technology choices directly and as a part of their day-to-day clinical decisions, using the platforms that have been developed with public monies over the past decade.

By recovering the savings from previous rounds of investments in IT, new investments can be made. Those should be designed to build the capacity of the public and private sector to respond to a faster pace of technological change, including support for grassroots innovation (as exemplified by the growing number of providers who use smartphones and tablets to perform their job better and more efficiently).

CREATE A CAPACITY TO RESPOND TO FAST-PACED TECHNOLOGICAL CHANGE

Infoway is both a high-tech and a government venture. The combination presents unique challenges which have threatened to overwhelm the public sector delivery model. High-tech ventures, regardless of industry, traditionally get some assumptions spectacularly wrong. In the private sector, high-tech start-ups constantly course-correct to respond to fast-changing technology trends.

Government agencies simply cannot respond and adjust with ease or keep pace with technological change. For a variety of good reasons, organizations like Infoway and the provincial agencies have to go through rigorous processes on procurement, reporting and auditing, and other processes. These processes mean that Infoway and the provincial agencies are sometimes too slow-footed for a maturing and digitizing healthcare industry. Existing agencies' scope may need to be redefined based on what governments have learned over the past decade and, in the end, many agencies may have to be replaced with something else.

Canadian governments are entering a period when they will ask how to monetize and/or sunset the provincial agencies, all the while driving the culture of information technology into the clinical businesses that clearly require it. The focus of new investments is likely to evolve away from large repositories, lab systems, or drug systems and toward those

"We see the Moore's Law effect happening in neurosurgery as well. For our three highest volume procedures, which comprise almost 80 per cent of most neurosurgeons' OR time, we have had major technology improvements that are dropping costs quickly."

- Retired Neurosurgeon

that drive change on the ground and that show tangible improvements in cost, quality, or access. Development projects that take a decade or more will no longer be acceptable as providers expect the same fast pace of modernization that they experience in other parts of their life.

Other structural forms are needed for a maturing industry. The recent decision to restructure Saskatchewan eHealth as a Treasury Board Crown Corporation is one possibly attractive model: Health IT is a service that needs a revenue model. The deal between the NWT and Alberta for the provision of Health technology is another model of multi-jurisdictional services that makes economic sense for both partners: one generates revenue, the other gets a service that they could not deliver on their own. In some provinces, a partnership with the private sector will be a better option to access capital and monetize assets.

HARVEST BENEFITS FROM PAST INVESTMENTS

To ensure sustainability, provinces need to consciously extract the productivity benefits from IT investments. This has not always happened so far.

For example, in the area of radiology, federal investments have resulted in improved productivity and 6-7 million new examinations—the equivalent of 420-500 new radiologists (Canada Health Infoway 2008). Presumably Canadians are received better, more accurate, and more timely diagnoses. This is good. But from a fiscal perspective, higher volumes have simply resulted in higher payments to radiologists, who have seen their incomes grow enormously. Governments must see a greater return on their investment in the form of lower fees per service.

Diagnostic radiology is now a fast-changing high-tech business thanks to substantial government investments over a long period of time. And like most high-tech businesses, it has a declining cost curve now and into the future. In other high-tech industries, competitive pressures ensure that gains are distributed away from providers and manufacturers to consumers in the form of added product quality and/or reduced prices.

Diagnostic Radiology should be less expensive and better next year than this year. Infoway has invested $340 million plus provincial and hospital funds to make it so (Canada Health Infoway 2008). These gains should

not go overwhelmingly to providers in the form of higher compensation. Rational, real-time adjustments, rather than quadrennial negotiations, should be made to the fee schedule. Policy makers require a systematic approach to harvest the gains and, in so doing, provide the public interest case and policy rationale to justify the next round of investments. Some suggestions on the appropriate approaches are discussed in the Pricing section of this report.

"When I returned to my Cardiology Fellowship in 2009 after a two year practicum the most significant change that I noticed was the decline in the pager. The ubiquitous buzz of the pager had largely stopped and been replaced by the ping of the smartphone. Residents and Interns had en masse switched to iPhones, Blackberries and even plain vanilla cell phone texting to communicate amongst themselves and with Attending Physicians and Fellows."

- Cardiology Fellow

SUPPORT GRASSROOTS INNOVATION

The action in eHealth is increasingly moving away from building large systems that are fraught with execution risk toward enabling providers and individual processes. For instance, smartphones are now a tool physicians commonly use in their practices, though not yet for virtual visits.

Smartphones, and more recently, tablets like the iPad, are being used in a variety of ways. Healthcare professionals use them to communicate quickly about mutual patients, send patient care orders to other members of the team, and get results in real time. Improved screen quality allows medical images such as ECGs, X-rays, and simple photos to be transmitted to specialists remotely in order to allow for quick diagnoses. While these devices do not yet support formal diagnostic quality, they are incredibly useful in daily practice, saving both time and lives.

These devices are revolutionizing the way that health practitioners deliver care. It is truly a grassroots revolution that is being driven by providers themselves, not by policy changes from above. The benefits are clear to doctors, nurses, and patients, but policy makers have thus far avoided engaging with these changes in a formal way. This will need to change.

Policy makers are beginning to think about how to provide regulatory support to IT-enabled providers. Rather than ignoring the evolution, policy makers will need to establish appropriate ways to incorporate smartphone technology, tablets, and unknown new technologies into eHealth plans.

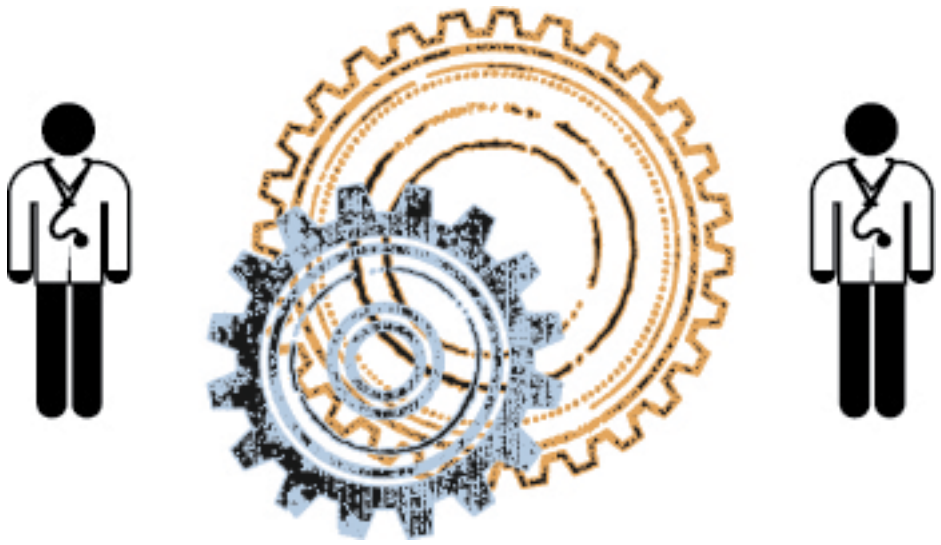
Concerns about privacy and the accuracy of information will need to be addressed, but the only way these can be addressed is by bringing the use of new technologies into plain sight so that their use can be properly managed. Privacy concerns are not insurmountable. Just as some travellers now choose to give up some privacy through trusted travellers programs like "NEXUS," some patients may choose to have a different level of

privacy for their health information in return for better service. Healthcare is increasingly a high technology service that can be delivered remotely, not just locally. In many parts of the system, services have a declining cost curve and governments can do a better job designing structures that allow the public purse to benefit from these declining costs. Infoway's investments in technology are dramatically improving not just access, but cost and quality as well in areas such as radiology.

The next generation of systems may allow for price competition among radiologists as is occurring in Scandinavia and other parts of Europe. This will break up geographic monopolies and allow improved competition within the public system. Well-designed auction systems could harness competition to promote the values of the Canada Health Act and allow better access to Canadians wherever they live. Residents of remote and rural areas may be the biggest beneficiaries from many of these changes, as they were with telemedicine, because they will have new ways of accessing the best quality remotely.

TABLE 5 Summary of Recommendations

CONCEPT	ACTIONS
USE DISRUPTIVE INNOVATION FRAMEWORK	• Shift health IT funding away from central planning to the front line providers
APPLY MOORE'S LAW TO HEALTHCARE	• Develop rational, real-time adjustments to the fee schedule
IMPROVE ACCESS AND QUALITY AS COSTS DECLINE	• Use digital systems to allow real-time competition among providers
TREAT HEALTHCARE AS A HIGH-TECH INDUSTRY	• Allow providers to use smartphones and tablets • Allow providers to use the telephone for patient consultations • Modernize privacy so that patients have choices that meet their care needs



ACTION 4

DEVOLVE DECISION MAKING SELECTIVELY & WHERE APPROPRIATE

This report has outlined the need for significant shifts in models of care to support efficiency and innovation. These reforms can be implemented without substantial regional governance restructuring by provinces. Large-scale restructuring now could result in slowing the pace of transformative change and delay Canadians' ability to recover the benefits of new technology and new models of care.

The time is now to begin to drive transformative change through the system. There are three major drawbacks to another round of restructuring at this time:

Constant structural change leads to politicization

In 1994, the Alberta Government enacted the Regional Health Authority Act, and established seventeen Regional Health Authorities. These Health Authorities replaced hospital and organizational boards in hope that the system would become horizontally and vertically integrated (Church and Smith 2008). In 2003, the number of authorities was reduced to nine (along with a cancer agency, a mental health agency, and an addictions agency). They were well run if sometimes expensive. In 2008 all the authorities were scrapped and replaced with a single super board—Alberta Health Services Board. This structural instability has resulted in the politicization of health decision-making. More governance discussions are likely to be a lengthy distraction.

Restructuring in Ontario would undermine strong, well-functioning hospital boards and executive teams

In Ontario, a significant reform might mean the decommissioning of more than half of the hospitals, which would bump up against local politics. In Ontario, hospital boards have been revitalized. They have been invested with accountability for costs, quality, and access and, in general, they work well. Restructuring would damage this progress.

Structural change requires a pause in transformation activities

It has been almost six years since Ontario introduced the LHIN system and only now is it approaching some stability. A restructuring would require redesigning, re-legislating, reappointing, and rehiring without addressing the reform's key goals. Policy makers need to use the emerging tools that we know can break down silos within the continuum of care, integrate primary care physicians into regional structures, and rationalize relations between the LHINs and Community Care Access Centres.

As governments consider roles, responsibilities and governance, one question is paramount: how can we quickly improve access and quality while bringing costs down? A new round of restructuring would mean real innovations would have to wait years.

Governments should approach changes to governance with scepticism. Should they pursue these reforms, they should recognize the opportunity costs—delay in transformation while restructuring takes place—and be very clear about the deficiencies of the current structure and confident that a new structure can be put into place that will produce better outcomes. Taken together, this is a high bar.

Caution before pursuing restructuring does not mean that governments should shy away from all changes to the roles and responsibilities of various actors. For example, in Ontario, four specific changes should be considered, all of which are applicable in other provinces as well, albeit with some modification to account for current differences between provincial systems:

1) Expand the role of regional bodies in purchasing

LHINs and community care access centres could be used as a basis for expanding the purchasing of clinical services. Regional bodies could also be given an expanded role in funding and organizing the primary care system. These changes would have the benefit of devolving some decision-making power on funding to the community level. These planning bodies might be better positioned to respond to the needs of individual communities than the central Ministry. Care would need to be taken to apply provincial purchasing models and expertise from the Ministry and Health Quality Ontario on a local basis. There are good examples in Ontario where this is already happening, such as telehomecare in three LHINs.

2) Strengthen Specialty Care Networks and/or Create a Multi-Specialty Agency (MSA)

Our organizational models in healthcare have traditionally been organized on the basis of geography. Virtualization makes easier an expansion of an alternative method of organizing treatment: not by geography, but by disease. Policy makers should consider this approach when there are benefits in terms of quality, access, or cost.

Canada has already had success in organizing by disease. Cancer Care Ontario (CCO) has successfully integrated the provincial cancer system across more than 100 sites of service. It is a planning and purchasing organization and helps produce better results for patients because it helps them navigate through the continuum of care. The Cardiac Care Network has had a mandate for more than a decade to plan and organize cardiac services across the province. Trillium Gift of Life organizes the organ donation and retrieval system across the province. The Ontario Ministry has recently extended this “disease-based” purchasing to chronic kidney disease (CKD) and diabetes. Virtualization makes possible even greater use of organization by disease.

Dr. Alan Hudson’s 2006 report outlined how to combine CCO with the Cardiac Care Network, Trillium Gift of Life (Organ transplantation), and other small specialty networks into a multi-specialty agency (MSA) (Hudson 2006). Through an MSA, the knowledge and procedures around purchasing and quality management that have been built for

cancer are extended to other disease states and care is organized based on the needs of patients no matter what facility is providing treatment. Hospitals and doctors are left in place but the MSA plans, purchases, and coordinates patient navigation.

A much more complete devolution to specialty care agencies should create active clinical service purchasing and management that can cut across health silos and integrate care. Specialty agencies have proven effective at collecting and interpreting data on quality and access, which can then be used to appropriately fund agencies that are improving outcomes.

While strengthening specialty networks may require some legislative and regulatory changes, they will likely be changes that can work within the current system and not require changes to structural frameworks. As the chronic kidney disease network rolls out, it will work with hospital providers to create a facilitated network for end-stage renal patients. Other diseases could follow. These reforms fit well within the purchasing framework defined further on in this report and fit with the disruptive innovation conceptual model.

3) Support and encourage organic mergers and acquisitions

The formation of the St. Joseph's Health System in Hamilton, and the mergers between Credit Valley and Trillium Health Centre in Mississauga, UHN and Toronto Rehab, and Sunnybrook and St. John's Rehab in Toronto are recent examples of organic consolidations that are happening outside of regional planning or government direction. These emerging organizations are now large and sophisticated healthcare systems that have a mission to provide a continuum of services to patient populations. These organic mergers create more efficient organizations, but the decisions to merge are being driven by the institutions and the communities—not centrally-directed restructuring efforts.

The capacity to manage major change increasingly exists within these larger healthcare institutions. Provincial governments and regional authorities can support these evolutions by encouraging organic, patient-focused, and locally driven re-organization.

Organic, community-led organizational transformation will build on the success of projects such as ECFAA, Access to Care, and CCO quality initiatives, all of which have strengthened hospital governance. Careful attention needs to now be directed to identifying the best areas for reorganization—and the tools that govern-

ments have at their disposal to encourage change to happen. Hospital-led reorganization does risk becoming solely focused on the needs of the hospital rather than the patient. Mergers to date have been focused on community needs and values. Attention needs to be paid to ensure that this continues.

4) Bring doctors into the emerging regional systems

Physicians should be included in emerging integrated systems, whatever their form. To date, the specialty networks have been the most effective at including doctors. CCO has included oncologists, for example. Moving forward, regional structures should consider including primary care physicians. This would require changes in the upcoming fee negotiations to the schedule of benefits and the organization of physicians. Doctors can also be directly included in the organic merged systems through more direct employment of physicians. While direct employment, rather than fee-for-service payments, has been unattractive in the past, the new generation of young physicians may be more open to considering these options. Provincial governments could encourage even further linkages between emerging health systems and group practices, such as FHTs in Ontario.

TABLE 6 Summary of Recommendations

CONCEPT	ACTIONS
USE DISRUPTIVE INNOVATION FRAMEWORK	• Allow regional bodies to experiment more easily with disruptive innovations • Organize specialty care initiatives to provide patient-centred care through facilitated networks
APPLY MOORE'S LAW TO HEALTHCARE	• Encourage existing and future specialty agencies to track cost, quality and access improvement data. Consider program management.
IMPROVE ACCESS AND QUALITY AS COSTS DECLINE	• Support organic mergers and acquisitions that can lead to efficiencies and scale • Increase role of physicians in community care to manage complex and chronic conditions • Encourage physician employment in health systems and linkages with FHTs
TREAT HEALTHCARE AS A HIGH-TECH INDUSTRY	• Give regional bodies a role in funding and organizing the primary care system • Start with functions not form. Stop endless restructuring of governance

ACTION 5

REFORM THE WAY HEALTH SERVICES ARE PURCHASED

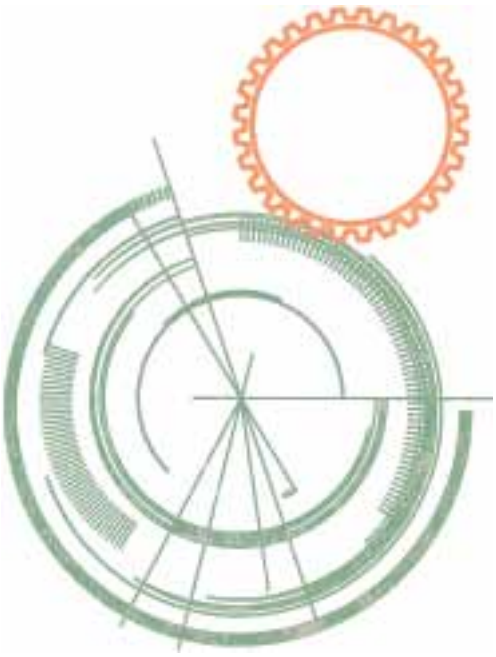
The pricing mechanisms for healthcare goods and services need to be rethought. The fiscal benefits of the disruptive transformation outlined in this report can best be achieved with significant reform in how governments pay for healthcare within the publicly funded system. In general, Canadian provinces continue to provide global budgets/block grants to hospitals and fee-for-service to physicians. These represent obstacles to many of the changes that are need in healthcare.

Both Michael Kirby in the 2002 Senate report *The Health of Canadians* and the OECD in *Economic Survey of Canada 2010* have recommended replacing global budgets for hospitals with activity-based funding. Governments should at last move ahead with these pricing reforms.

Many of the transformative changes listed above will add some short-term costs as they are implemented. Quality, access, digitization, virtualization, and the establishment of new clinics are investments with longer-term payoffs. Savings cannot be fully recaptured within the public healthcare system without changes to the pricing mechanism. It will be crucial to ensure that technological advances do not simply add to inappropriate and unnecessary care, which continues to be a significant driver of healthcare spending.

Many of the transformations discussed in this report should produce significant cost savings if pricing and incentives are appropriate. Examples could include:

- VAP procedures yield more savings when they are paid on an outcome basis. This may include a bundled payment for the procedure along with any post-acute care. A bundled payment would mean that one payment is issued and one provider would determine how this is allocated for the various services the patient requires.
- Facilitated networks will best integrate care across the continuum if paid on a membership (i.e. capitated) basis, whereby quality and outcomes are monitored and measured.
- The savings possible through the virtualization of services will best be realized if the need for physical contact is systematically removed from fee schedules.
- Primary care could yield savings if regional bodies are allowed to respond to local needs by influencing—or even controlling—physician payments.
- Breaking apart "silo-based funding" that flows only to one type of institution and directing funding across the continuum would encourage more cooperation and consolidations to occur among providers.
- Recovering the cost savings in areas like cataract surgery, orthopaedics, radiology, and endoscopy might be accelerated by the introduction of auction systems into payment methodologies—creating internal markets within the public system for particularly fast-changing areas of technology.



"Overall, the majority of witnesses agreed that after years of global budgets in a number of provinces, no one knows how much anything costs any more and that, as a result, it is difficult to know even approximately what the public is getting for its spending on hospitals."

- Kirby Report 2002, chapter 2.1.4

The question for policy makers is not whether but rather how to implement funding reform that shares the benefits of productivity gains between provincial governments and providers. A commitment to activity-based financing in the acute care hospital sector will create significant momentum to rethink pricing in other areas of healthcare. Activity-based financing involves paying a case-based payment rather than through a block grant or global budget. Activity-based payment rates can be set based on prior period costs, normative pathway models (which examine how care should be delivered), and/or using auction models in which volumes are contested by different providers within a public sector envelope.

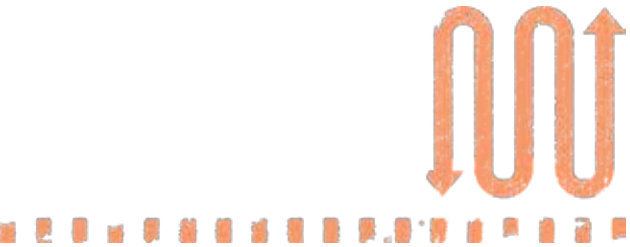
Activity-based payments are often conflated with cost-based or population-based systems. This limits the discussion and the policy options available. Today, payments are modelled based on costs. We need to move beyond cost-plus modelling and look at other methods of setting prices (Falk 2011a; Falk 2011b). A mixed model that uses price signals from several systems would allow flexibility and provide stability to the system.

Policy makers may find it most effective to address five areas of clinical purchasing in parallel: physician (and allied professional) payments, pharmacies, home care, acute care (including post-discharge care), and long-term chronic care (with patient navigation). Lab services may be a sixth area or may be bundled into the five above, given that laboratory medicine is important across the board.

Tackling these five (or six) together will allow policy makers to build expertise in areas such as pricing negotiations, costing models, and incentives. Such an approach could provide a coherent framework to govern the transformation in payment models which will allow recovery of the benefits from investments made.

PHYSICIAN (& ALLIED HEALTH PROFESSIONAL) SERVICES

Canada's doctors have had a very good decade. For example, total clinical billings have risen in Ontario by an average of 8.9 per cent per year in the past five years (CIHI 2010b). A hard cap on total physician payments, like the one imposed in the 1990s, could be justified. Even increases of 3 per cent—still above inflation levels—could curb spending growth by $5 billion over the life of a four year agreement and would result in fee schedule adjustments *downward* of an average of 3-4



"Fee-for-service payments to physicians for ECG reading are a complete waste. I get paid $9.90 to read an ECG which has already been read by a computer with nearly 100 per cent accuracy. ECGs are always used in real-time by clinicians. Having me confirm the computer's interpretation of the ECG a day after it has been performed is a complete waste of money. At my hospital alone $400,000 in fee-for-service payments would be saved if ECGs interpretation was no longer a benefit of OHIP."

- Practicing ICU Physician at a Toronto hospital

points per year (given current volume trends).[7] This hard cap could be considered if other reform options are not forthcoming from physicians.

Healthcare practitioners and governments are partners in delivering healthcare services in Canada. Governments and medical associations should work together to undertake significant payment reforms that would allow productivity improvements to be shared more equally. Some of the options to consider include:

1) Medical associations could apply fee reductions more fairly across specialties. Available mechanisms include:

- A capital charge on public investments in new technologies for specialists who have seen large increases in their income due to productivity gains.
- A review of reductions in the length of hospital stay and operating room time used for different surgeries and a proportional reduction in the fees paid.
- An annual reduction of lab fees to reflect ongoing technological improvements.
- A review of specific technological innovations that should be reflected in fees paid.
- An automatic review of any specialty area that sees significant volume growth in any one year.

2) Membership-based group systems could be expanded with payments made to physicians (and allied practice professionals) for the management of care in facilitated networks.

3) Physical contact requirements could be removed from fee schedules.

When group practices are funded on a membership/capitated basis, these practices could be responsible for the whole continuum of care, which would mean that the group practices would themselves make or monitor payments for acute care, pharmaceuticals, home care, and other forms of care.

PHARMACIES

Recent reforms in Ontario have reduced prescription drug costs by approximately $500 million per year by increasing transparency in dispensing fees and monitoring generic drug prices (MOF 2011a). This is a huge endorsement of the value that can be unlocked through pricing transparency and reform. It lays a foundation for possible additional steps, including increasing generic substitution, substitution of clinically equivalent products, better medication compliance, and managing pricing and drug supply chains more aggressively.

The next generation of pharmacy reforms can go well beyond drug costs to create systemic savings. Remote dispensing and pharmacy virtualization are major trends (see PharmaTrust textbox above) which could transform pharmacy services across Canada as OTN is transforming nursing and physician consultations. Pharmacists can interact remotely with patients in a variety of locations using automatic dispensing systems. This refocuses pharmacists on advising patients on their medication needs rather than dispensing pills. This virtualization may cause a reorganization of the pharmacy supply chain that could expand several opportunities:

- Increased ability to encourage generic and clinically equivalent substitution.
- Automatic creation of a medical record during drug dispensing.
- The ability to do virtual home consultations through videoconferencing to monitor compliance with medication regimes.

The pharmacy reforms begun in Ontario and in BC in 2007 are taking hold across the country. Pharmacy pricing has shown the value of a functioning price mechanism to return the benefits from lower costs to the government and public.

HOME CARE PURCHASING

In recent years, the home care market has matured and excellent progress has been made on home care pricing and procurement. More can be done. The design of home care purchasing should respect the fact that a number of players will need to buy home care services. Both acute care hospitals (receiving bundled payments) and physician practices (managing chronic conditions) will need to purchase home care for their customers. Dialogue between practitioners, government and, organizations will be necessary.

Investment and transformation in home care will make life better for patients and provide technology to many community-based nurses so that they can perform even better. Technology-based transformation of the system to enable a mix of physical and virtual visits from nurses, allied care providers, and physicians should end up providing better

quality care to patients and their families. Auctioning and/or procurement processes could facilitate these improvements.

ACUTE CARE

Any move away from global budgets to activity-based payments will be disruptive and transformative for the acute care hospital sector. An activity-based payment system is likely to lead to consolidation among providers. Smaller, poor performing hospitals and low volume providers will be threatened. In the end, this is likely to have a beneficial effect on both cost and quality.

To maximize outcomes and recover savings, payment methods must be appropriately designed for each distinct business model:

+ Solution Shops should be paid on a cost-plus time and materials basis. This is similar to today's models but should be focused on the highest quality diagnosticians and linked to virtualization to allow the best providers and diagnostic services to be delivered to everyone. This could expand the reach of the large academic centers and bring outlying solution shops under the quality control and performance measurement systems of world leaders in larger academic centres.

+ VAP Clinics could be paid a straight outcome-based fee for a well-defined service. This may be a bundled payment that includes post-acute care. Many more services should be moved into VAP payment models with price competition among providers. Once a price is set for procedures, the corresponding funds would need to be removed from the base funding allocated to hospitals. A systematic process to identify new areas of "precision medicine" will be needed, with new procedures being added over time as they move into the realm of precision medicine.

+ Facilitated networks could be paid on a membership (or capitation) basis and, over time, would evolve to take on the principal role in chronic care. These networks could be allowed to compete for volumes based on price. To successfully move in this direction, healthcare providers would themselves have

to be able to make payments to other providers who would be taking responsibility for some aspect of the care continuum. Because Canada has not yet developed good models to allow this, capitated payment models and patient navigation models for chronic conditions continue to face hurdles in most provinces. These will need to be addressed by policy makers.

Transforming how governments pay providers for healthcare is an important step to realizing fiscal savings from the technological changes underway in the system. These changes in pricing models contribute to greater fiscal sustainability and also incent improvements in quality and access. By providing appropriate funding to healthcare providers and having them pay for the services their patients need, patient and provider incentives will be aligned to promote better health outcomes. By allowing for pricing competition among providers we will allow the more effective providers to gain volume and drive down overall system costs.

LONG-TERM CHRONIC CARE

A patient navigation function, appropriately compensated, that focuses on organizing care for the highest utilizing 1 per cent of patients is an idea whose time may have come (OHA 2010). Policy makers can support this approach and move toward achieving it by using a facilitated network payment arrangement for a variety of chronic conditions. Membership-based pricing systems are becoming increasingly sophisticated.

The key design principle is that the navigating provider would be responsible for setting up the entire treatment course *and* for paying other providers including other hospitals and physicians. This would lead to a patient navigation function and integration across the care continuum. It would redefine the roles of the players in the system and would force integration among hospitals, home care, and physicians, and can be done in a way that ensures that the navigating provider does not carry any financial risk for these payments.

It is likely that a patient navigator system will add costs in the short term because it will require the introduction of new funds. However, recovering these costs over the medium term is likely as navigating providers help patients get the care they need while avoiding unnecessary procedures.

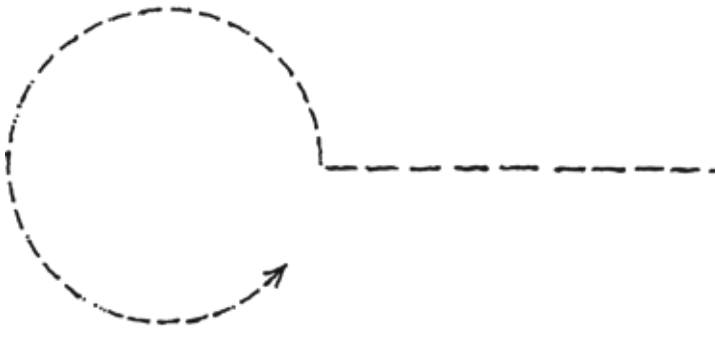
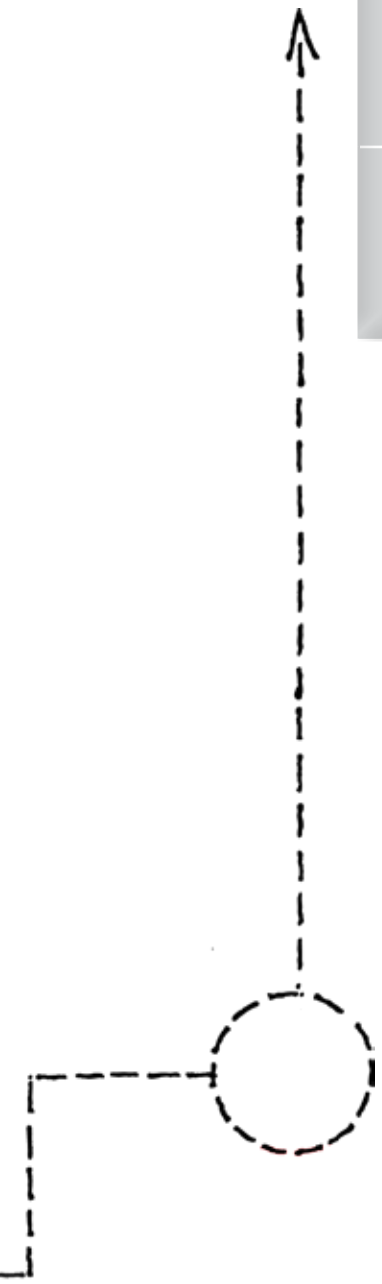
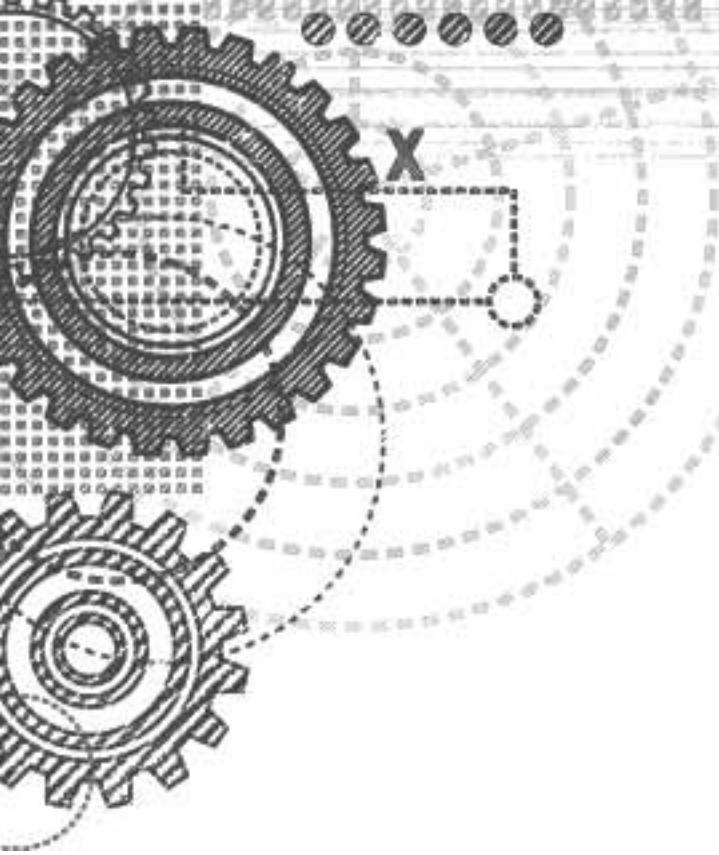


TABLE 7 Summary of Recommendations

CONCEPT	ACTIONS
USE DISRUPTIVE INNOVATION FRAMEWORK	• Group-based payments for facilitated networks • Implement virtual pharmacy and virtual nursing in underserved areas
APPLY MOORE'S LAW TO HEALTHCARE	• Medical associations should self-monitor and reduce fee levels fairly by recognizing where efficiency gains have arbitrarily rewarded certain specialties
IMPROVE ACCESS AND QUALITY AS COSTS DECLINE	• Virtual visits priced appropriately would increase volume and keep costs down • Have group practices purchase acute care, drug, home care, and long-term care • Take steps to ensure that unnecessary procedures that do little for quality are not performed
TREAT HEALTHCARE AS A HIGH-TECH INDUSTRY	• Implement activity-based pricing • Fund solution shops using zero-based budgeting to allow transparent cost plus time and materials funding • Fund VAPs using fee-for-outcome, including post-acute care • Fund Facilitated networks based on membership





CONCLUSION

Current rates of growth in government spending on healthcare are not sustainable. This report has outlined a framework that suggests there is hope that costs can be brought down. Canadian government investments over the past decade have established a platform on which we can harvest the productivity gains from these investments. The result is a transformation in our healthcare system, facilitated by technology.

Policy makers are increasingly seeing healthcare as the high-tech industry that it is. Regulations, pricing, and administrative models will need to catch up to reflect this. This new lens through which governments are seeing healthcare represents a significant change from traditional approaches. It creates huge opportunities to improve access and quality for patients, without increasing costs.

Key changes occurring include the use of disruptive technologies, huge productivity and efficiency gains in some practice areas, improved quality in some procedures without increased cost, and new forms of compensation. Policy makers are finding ways to encourage these evolutions.

General hospitals may be broken up to allow innovation to occur. Virtualization of healthcare will expand. How practitioners are compensated should evolve. The pricing and regulatory environment will be challenged to keep up with real time changes that take place far more quickly than traditional administrative processes can move.

This policy discussion has nothing to do with current debates over alternative ways of channelling more money into the healthcare system through higher taxes, user fees, or more for-profit care. Those debates distract us away from what is really going on: a technological revolution in healthcare that holds open the promise of reigning in the growth in healthcare spending in a manner consistent with the Canada Health Act —if policy makers, practitioners, and patients manage this clutch moment properly.

SOURCES CITED

Baumann, Andrea, Jennifer Blythe, Ann Rheaume, and Karen McIntosh. 2006. "Internationally Educated Nurses in Ontario: Maximizing the Brain Gain." *Human Health Resources Series*, 3, November 2006. Hamilton, ON: Nursing Health Services Research Unit.

Canada Health Infoway. 2008. *Diagnostic Imaging Benefits Evaluation Final Report*. Ottawa: Canada Health Infoway.

Canadian Institute for Health Information (CIHI). 2004. *Workforce Trends of Registered Nurses in Canada*, 2003. Ottawa: Canadian Institute for Health Information.

Canadian Institute for Health Information (CIHI). 2005. "Inpatient Hospitalizations and Average Length of Stay Trends in Canada, 2003-2004 and 2004-2005." *CIHI Analysis in Brief*. November 30, 2005. Ottawa: Canadian Institute for Health Information.

Canadian Institute for Health Information (CIHI). 2010a. *National Health Expenditure Trends, 1975-2010*. October 2010. Ottawa: Canadian Institute for Health Information.

Canadian Institute for Health Information (CIHI). 2010b. *National Physicians Database – Payments Data, 2008-2009*. Ottawa: Canadian Institute for Health Information.

Canadian Institute for Health Information. 2011. *Wait Times in Canada—A Comparison by Province*, 2011. Ottawa: Canadian Institute for Health Information.

Casey, Bernard, Howard Oxley, Edward Whitehouse, Pablo Antolin, Romain Duval and Willi Leibfritz (2003). "Policies for an Aging Society: Recent Measures and Areas for Further Reform." *OECD Economics Department Working Paper No. 369*. November 20, 2003. Paris: OECD.

Christensen, Clayton, Jerome H. Grossman, and Jason Hwang. 2009. *The Innovator's Prescription: A Disruptive Solution for Health Care*. New York: McGraw-Hill Professional.

Church, J., and N. Smith. 2008. "Health Reform in Alberta: The Introduction of Health Regions," *Canadian Public Administration* 51 (2):217-238.

Computer Economics. 2005. *Desktop PC Price/Performance Study 2001-2005*.

Decter, Michael. 2010. *Tales from the Back Room: Memories of a Political Insider*. Winnipeg: Great Plains.

Dodge, David A. and Richard Dion. 2011. "Chronic Healthcare Spending Disease: A Macro Diagnosis and Prognosis." *C. D. Howe Institute Commentary 327*. April 2011. Toronto: C. D. Howe Institute.

Drummond, Don and Derek Burleton. 2010. "Charting a Path to Sustainable Health Care in Ontario." *TD Economics Special Reports*. May 27, 2010. Toronto: TD Bank Financial Group.

Falk, William. 2011a. "Healthcare, Moore's Law and Joints; A statistical appendix and discussion of case costing." *Longwoods*. Accessed at: http://www.longwoods.com/content/22509.

Falk, William. 2011b. "Radiology as an Example of Moores Law in Healthcare - Getting to Sustainability." *Longwoods*. Accessed at: http://www.longwoods.com/content/22475.

Gandalf Group, The. 2009. "Building A Public Consensus For Action – Canada's Fiscal Turnaround in the 1990s" (Presented at the Centreforum's "Dealing with Debt – Lessons from Abroad" Conference, November 2009).

Health Quality Ontario. 2011. *Quality Monitor: 2011 Report on Ontario's Health System*. Toronto: Health Quality Ontario.

Hudson, Alan. 2006. *Report of the Review to Optimize Cancer, Cardiac, and Transplantation Services in Ontario*.

Law, Michael R., Allison Ystma, and Steven G. Morgan. 2011. "The Short-term Impact of Ontario's Generic Pricing Reforms." *UBC Centre for Health Services and Policy Research Working Papers*, May 2011. Vancouver: UBC Centre for Health Services and Policy Research.

Legislative Assembly of Ontario. 2009. Bill 179 *Regulated Health Professions Statute Law Amendment Act, 2009*. Royal Assent, December 15 2009.

Mansell, Peter. 2011. "PatientsLikeMe Lithium Study Shows Real-time Value of Social Networks." *Pharma Times Online*. Accessed at: http://www.pharmatimes.com/article/11-04-26/PatientsLikeMe_lithium_study_shows_real-time_value_of_social_networks.aspx.

McCarthy, Douglas, Kimberly Mueller, and Jennifer Wrenn. 2009. "Kaiser Permanente: Bridging the Quality Divide with Integrated Practice, Group Accountability, and Health Information Technology." *Commonwealth Fund Publication 1278*, Vol. 17, June 2009. NYC: The Commonwealth Fund.

Moore, Gordon. 1965. "Cramming More Components onto Integrated Circuits." *Electronics*, 38(8), April 19, 1965.

National Institute of Health (NIH). 1994. "Helicobacter pylori in peptic ulcer disease. NIH Consensus Statement." January 7-9, 1994, 12(1): 1-23.

OECD. 2010. "Value for Money in Health Spending." OECD *Health Policy Studies*. October 7, 2010. Paris: OECD.

Ontario Hospital Association (OHA). 2010. Ontario Association of Community Care Access Centres, and Ontario Federation of Community Mental Health and Addiction Programs. *Ideas and Opportunities for Bending the Healthcare Cost Curve: Advice for the Government of Ontario*. April 2010.

Ontario Medical Association (OMA). 2010. "Patient-centred Care." *Ontario Medical Review*, June 2010, 34-49.

Ontario Ministry of Finance (MOF). 2011a. *Ontario Budget 2011*. Toronto: Government of Ontario.

Ontario Ministry of Finance (MOF). 2011b. "Disclosure for 2010 under *the Public Sector Salary Disclosure Act, 1996*: Hospitals and Boards of Public Health". Toronto: Ontario Ministry of Finance. Accessed at http://www.fin.gov.on.ca/en/publications/salarydisclosure/2011/hospit11.html.

Ontario Ministry of Health and Long-Term Care (MOHLTC). 2008. *Improving Access to Care: A Three-Year Progress Report on How Wait Times Information is Transforming Healthcare in Ontario*. Toronto: Ontario Ministry of Health and Long-Term Care.

Ontario Ministry of Health and Long-Term Care (MOHLTC). 2011a. "McGuinty Government and Ontario's Doctors Working Together." Toronto: Press Release. Accessed at: http://news.ontario.ca/mohltc/en/2011/08/improving-publicly-funded-health-care-for-ontarians.html

Ontario Ministry of Health and Long-Term Care (MOHLTC). 2011b. *Health Bulletins: Health Quality Ontario to Promote Evidence-based Health Care*. Toronto: Press Release. Accessed at: http://www.health.gov.on.ca/en/news/bulletin/2011/hb_20110404.aspx

Ontario Telemedicine Network. Telehomecare. http://otn.ca/index.php?uri=/en/services/telehomecare/.

Parliamentary Budget Officer. 2010. *Fiscal Sustainability Report 2010*. February 18, 2010. Ottawa: Government of Canada.

Picard, Andre. 2010. "Patent expiry for some blockbuster drugs presents huge saving opportunity." *The Globe and Mail*, June 23, 2010.

Porter, Michael and Elizabeth Teisberg. 2006. *Redefining Health Care: Creating Value-Based Competition on Results*. Watertown, MA: Harvard Business Press.

Rochon, Mark. 2011. "Restructuring Health and Hospital Services: The Ontario Experience" (Presentation for the Canadian Health Services Research Foundation). Accessed at: http://www.nuffieldtrust.org.uk/talks/slideshows/mark-rochon-restructuring-health-and-hospital-services-canada

Romanow, Roy. 2002. *Building on Values: The Future of Health Care in Canada*. Ottawa: Government of Canada.

Shapiro, Irving, Matthew Shapiro, and David Wilcox. 2001. "Measuring the Value of Cataract Surgery." In David Cutler and Ernst Berndt, eds. *Medical Care Output and Productivity*. Chicago: University of Chicago Press.

Standing Senate Committee on Social Affairs, Science and Technology (Kirby Report). 2002. *The Health of Canadians – The Federal Role*. Ottawa: Government of Canada.

You, John J., David A. Alter, Karey Iron, Pamela M. Slaughter PM, Alexander Kopp, Raymond Przbysz, Deva Thiruchelvam, Linda Devore, and Andreas Laupacis. 2007. "Diagnostic Services in Ontario: Descriptive Analysis and Jurisdictional Review." *ICES Investigative Report*, April 2007. Toronto: Institute for Clinical Evaluative Sciences.

ENDNOTES

1. Authors' calculation based on data from CIHI 2010a.
2. From 1993-4 to 2003-4, there was a 300% increase in CTs and a 600% increase in MRIs. These trends have likely continued.
3. Brian McFarlane, discussion with the authors.
4. Dr. Robert S. Bell talk at the CD Howe Institute, June 2011.
5. Dr. Peter Rossos, discussion with the authors.
6. Dr. Ed Brown, CEO of Ontario Telemedicine Network, discussion with the authors.
7. Authors' calculation based on CIHI 2010b.

ACKNOWLEDGEMENTS

This paper was reviewed by scholars, practitioners and current and retired government officials, including those identified in the list below. However, the opinions and recommendations expressed are those of the authors. Some experts consulted for the paper have requested anonymity.

Review Panel

Adalsteinn Brown, Dalla Lana Chair of Public Health Policy in the Dalla Lana School of Public Health, University of Toronto, and a Scientist in the Keenan Research Centre in the Li Ka Shing Knowledge Institute of St Michael's Hospital.

Brian Golden, Sandra Rotman Chair in Health Sector Strategy at The University of Toronto and The University Health Network; Executive Director, Collaborative for Health Sector Strategy; Professor of Strategic Management at Rotman School of Management, University of Toronto

Mark Stabile, Director, School of Public Policy and Governance; Professor of Business Economics and Public Policy, Rotman School of Management, University of Toronto

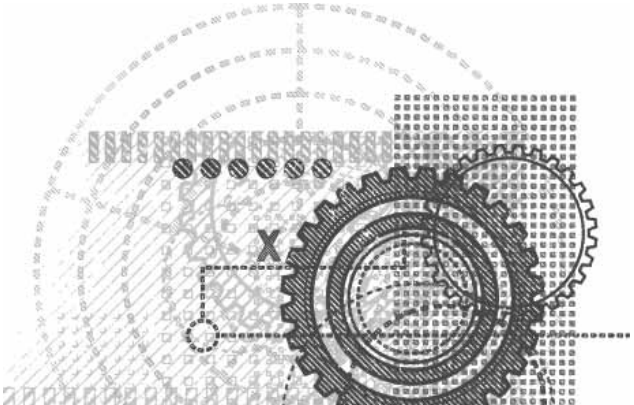
Experts Consulted

Mark Rochon
Michael Decter, OC
Dr. Bob Bell, University Health Network
Kate Fillion, Maclean's
Terry Sullivan, University of Toronto
Dr. Sacha Bhatia, Cardiologist, Mass General
Dr. Mike Warner, Intensivist, Toronto East General Hospital
Candice Camilleri, Ontario Ministry of Health and Long-term Care
Azi Boloorchi, Ontario Ministry of Health and Long-term Care
Dr. Ed Brown, Ontario Telemedicine Network
Karli Farrow, Trillium Health Care
Hugh MacLeod, Canadian Patient Safety Institute
Duncan Sinclair, Queen's University
Kevin Smith, St. Joseph's Healthcare System
Matthew Anderson, William Osler Health System
Camille Orridge, Toronto Central Local Health Integration Network
Dr. Alan Hudson, OC
Brad Davis, University Health Network, Sunnybrook Health Sciences Centre
Dr. Mehran Anvari, CSII
Dr. Danielle Martin

Research Assistants

Dylan Marando | **Matt Townsend** | **Esther Pollack**

Designed by Neville McGuire



FISCAL SUSTAINABILITY & THE TRANSFORMATION OF CANADA'S HEALTHCARE SYSTEM

A Shifting Gears Report

The Mowat Centre is an independent, non-partisan public policy research centre located at the School of Public Policy & Governance at the University of Toronto. The Mowat Centre undertakes collaborative applied policy research and engages in public dialogue on Canada's most important national issues, and proposes innovative, research-driven public policy recommendations, informed by Ontario's reality. **www.mowatcentre.ca**

The School of Public Policy & Governance has two broad goals: to form a dynamic hub for policy discourse, bringing researchers, practitioners, and interested members of our community together to contribute to policy debates, development, and discussion across many areas of expertise, both nationally and internationally; and to educate students enrolled in our innovative Master of Public Policy graduate professional program to be effective leaders and practitioners in public policy. Our academic program is led by leading public policy practitioners alongside renowned academics, and is substantiated by an extensive professional development training series, an internship program that connects our students to job opportunities in the policy community, and an exciting lineup of conferences, symposia, seminars and events. **www.publicpolicy.utoronto.ca**

KPMG LLP provides Audit, Tax, and Advisory services to help organizations manage risk and performance in the dynamic and challenging environments in which they do business. Our clients include corporations, governments, public sector agencies and not-for-profit organizations. The KPMG Public Sector industry practice assists public sector organizations to successfully manage change and achieve their desired outcomes. Through a combination of global insights and local experiences, our consultative approach seeks to support organizations to achieve innovative solutions in today's challenging economic environment.

KPMG LLP is a Canadian limited liability partnership established under the laws of Ontario. With 32 locations across the country, KPMG LLP is the Canadian member firm of KPMG International Cooperative ("KPMG International"). KPMG member firms around the world have 138,000 professionals, in 150 countries. The independent member firms of the KPMG network are affiliated with KPMG International, a Swiss entity. Each KPMG firm is a legally distinct and separate entity, and describes itself as such.
www.kpmg.ca

MOWAT

KPMG

School of Public Policy & Governance
UNIVERSITY OF TORONTO