



**MEDEC**

CANADA'S MEDICAL TECHNOLOGY COMPANIES

LES SOCIÉTÉS CANADIENNES DE TECHNOLOGIES MÉDICALES

# The Innovation Dilemma: *Achieving Value, Health Outcomes and Contributing to the New Economy*

The Future of Medical Technology in Canada

January 2017

This publication was produced by OPTIMUS | SBR on behalf of MEDEC, the national association created by and for the Canadian medical technology industry.

Prepared by OPTIMUS | SBR © 2017. All rights reserved.

## TABLE OF CONTENTS

Executive Summary .....	3
Introduction .....	6
Value of Medical Technology .....	7
Current State of Medical Technology .....	12
Issues and Challenges .....	18
The Future of Medical Technology in Canada .....	22
Vision for Medical Technology in Canada .....	25
Conclusion.....	28
Citations.....	29

## Executive Summary

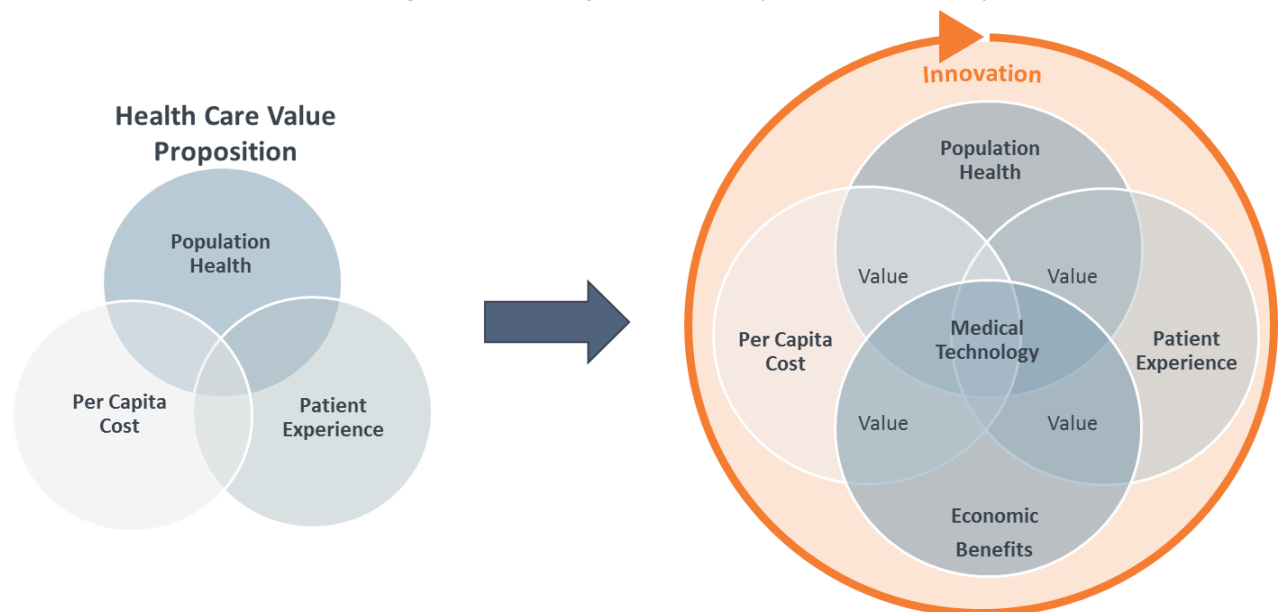
### Background

OPTIMUS | SBR was engaged by MEDEC, the association that represents Canada’s medical technology companies, to investigate a number of major questions: *What is the value that medical technology can bring to Canada? Why have we not been able to harness this value effectively? What can we do to realize more value from medical technology? How can harnessing the value of medtech contribute to better patient outcomes and health system sustainability?*

Health systems are rightly focused on the ‘Triple Aim’, whereby cost is only one element of the value proposition. Healthcare sustainability and efficiency efforts by governments and system stakeholders are focused on value-based approaches where the goals are to improve quality and deliver better outcomes that are meaningful to the health system and patients, while managing costs and creating efficiencies.

Many OECD countries around the world recognize the value of innovation that medical technologies can bring. While Canada is poised to embrace innovation, the ensuing investments in medical technologies are sub-optimal relative to their OECD counterparts. As healthcare systems across Canada seek to address their challenges, all parts of our systems must work together to support innovation, improve quality, increase sustainability and realize value. Medical technology can play an important role in achieving these ends by enhancing quality, improving access, delivering improved outcomes, supporting system sustainability and enabling economic development.

Figure 1: Innovation for Patients, the System and the Economy



## Research Findings: The ‘Value Gap’

The research undertaken to inform this paper focused on the state of medical technology in Canada and abroad, and points us to many different ways that value-based healthcare is being advanced and adopted. The challenge is that adoption of innovation remains difficult to spread and scale across Canada, and there are constant and growing pressures to improve both access and outcomes while managing costs.

This paper identifies four major barriers to the adoption of innovative medical technology in Canada:

1. System structures that hinder appetite for innovation;
2. Public and private sectors with differing cultures around innovation adoption;
3. A lack of trust between the public and private sectors; and,
4. Limited and dispersed leadership to drive change and the adoption of innovation

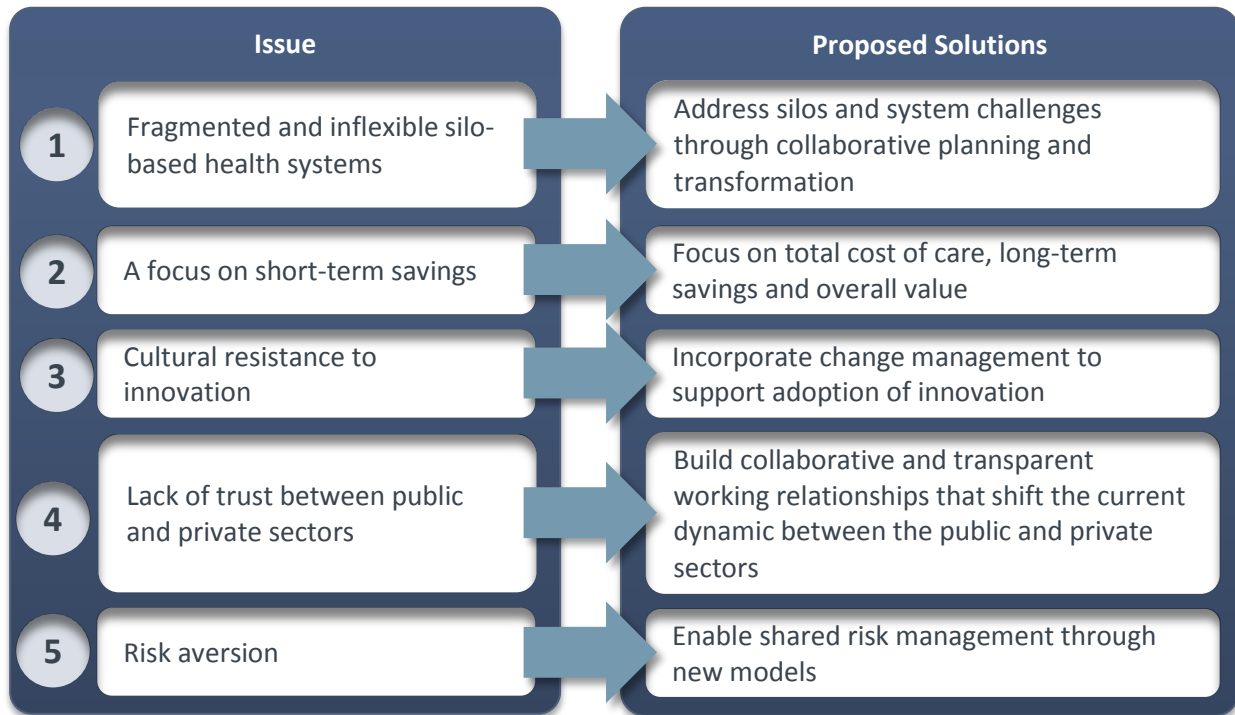
Together these barriers create a ‘value gap’ and prevent Canada from harnessing all of the potential of medical technology, and Canadians cannot access the same innovative technologies as patients in other parts of the world.

## Issues and Solutions to the Innovation Dilemma

Canada must decide and then act to harness the potential of the medical technology sector. This can improve patient and population health outcomes, help to co-manage and share risks, and support realization of the full potential of health system and economic value. All stakeholders need to reflect and decide if they are fully committed to supporting a strong medical technology sector so that all Canadians can benefit. To do this, there must be a recognition that the status quo is not cost-effective, sustainable or conducive to optimizing patient outcomes.

While there are issues, there are also potential solutions to address the innovation dilemma. The goal of this research was to seek to understand the state of the medical technology sector in Canada and around the world, shed light on promising practices to adopt value-based approaches, and describe some of the issues that can be addressed through collaboration between the public and medical technology sectors.

Table 1: Summary of Issues and Solutions to the Innovation Dilemma



There is no one size fits all approach to harness innovation in Canada. However, there is enough information from healthcare panels, white papers, literature and leading practices across jurisdictions to identify ways for meaningful collaboration with a common set of principles to anchor discussions about value-based approaches. The solutions proposed in this paper are ones to facilitate this dialogue.

## Vision for the Future

Thinking differently about the role of medical technology in our health system and building smart and more collaborative relationships between the public and private sectors is required if Canada wants to achieve better health outcomes and contribute to the new economy through adoption of innovation.

The research and interviews of stakeholders identified common acknowledgement that Canada is leaving value on the table at a time when we can least afford to do so. This raises questions about how Canada can capture all the value that the medical technology sector can provide, not just for patients and the healthcare system, but for the economy and the country as a whole.

## Introduction

Canada's healthcare system is struggling and continues to lag behind peer countries in terms of quality, access, efficiency and equity. The Commonwealth Fund's most recent national health system scorecard ranked Canada 10<sup>th</sup> out of 11 peer countries – ahead of only the United States. Canada was second from the bottom for safe care, timeliness of care and efficiency.

At the same time, innovation in health technology has been hailed as a solution that can tackle these challenges, addressing cost and care issues at all levels of the system. However, improvements in healthcare are incremental at best, and there has not been a concerted or coherent effort to scale-up and spread promising ideas.

The purpose of this paper is to explore how medical technology and innovation help to improve health outcomes and contribute to the new economy. OPTIMUS | SBR was engaged by MEDEC, the association that represents Canada's medical technology companies, to investigate several major questions:

- What is the value that medical technology can bring to Canada?
- Why have we not been able to harness this value effectively?
- What can we do to realize more value from medical technology?
- How can harnessing the value of medtech contribute to better patient outcomes and health system sustainability?

This research was conducted with the guidance of MEDEC's Value of Technology Steering Committee. The content and themes of the paper were informed through stakeholder interviews, a literature review and a jurisdictional scan. Sources and inputs included:

- Over 20 interviews with Canadian and internationally-recognized leaders representing industry, the medical technology sector and the public sector.
- A review of academic and grey literature, including reports and publications from industry organizations and associations, government and public sector agencies, think tanks and peer-reviewed journals.
- A scan of other jurisdictions and how they support medical technology innovation.

## Value of Medical Technology

### Value to the Health System: The Triple Aim

Over the past few years, healthcare systems around the world have been increasingly focused on realizing specific kinds of value, namely those captured in the Institute for Healthcare Improvement's 2008 "Triple Aim" framework: population health, patient experience, and (per capita) cost.<sup>1</sup> Healthcare systems in Canada and other countries are focused on solutions that offer the most promising combination of health outcomes, high quality and positive patient experiences and sustainable cost structures. Value-based healthcare, pioneered by Harvard's Michael Porter, is one of the most prominent examples of how systems can set up structures to realize these dimensions of value.<sup>2</sup>

Patient experience is focused on the quality of the care experience from the perspective and needs of the patient, and includes a combination of access to care, engagement or involvement in care and care planning, and access to health information. Efforts to realize value can also be seen in the recent focus on 'bending the cost curve' in Canada, though this effort has primarily focused on cost-reduction rather than a holistic approach that includes patient outcomes. This has driven many recent transformation efforts to shift care out of hospitals and into the community or home.<sup>3</sup>

### Medical Technology Value Contribution

As an industry, medical technology has continuously used innovation to support and align with these health system dimensions of value. Medical technology includes a range of devices that support diagnosis, delivery of care, procedures and ongoing needs of a patient. For many years, medical technology was focused on improving care of individual patients, and there is now increasing evidence that it can also support broader system objectives like increasing quality, decreasing costs, improving prevention, while also contributing to broader economic development.



**1** *Enhancing quality and safety of patient care*

Medical technology contributes to improved health outcomes through less invasive and faster procedures, reduced error rates and complications, and faster recovery times. Medical technology also improves health outcomes and allows patients to take a more active role in recovery or chronic disease management by supporting monitoring and self-administration at home.

**2** *Improving access to effective medical technologies across the continuum of care*

Advances in medical technology are changing the context in which patients receive care, from acute settings to community or home-based settings. Supporting the safe and effective delivery of care in these non-acute environments helps to free capacity in the acute care system and supports patients to remain at home or in the community for as long as possible.

**3** *Supporting sustainability of Canada's publicly-funded healthcare systems*

Medical technology offers the potential for both direct and indirect cost savings and improved data to support decisions in care provision and system planning. Less invasive procedures and improved health outcomes reduce the average cost to treat patients by reducing treatment times, shortening hospital stays and reducing the costs of long-term complications and readmissions. Increasingly, medical technology is also realizing additional value for the planning and management of health systems by providing improved data on both the quality and effectiveness of care delivery.

**4** *Enabling economic development through investments and highly-skilled jobs*

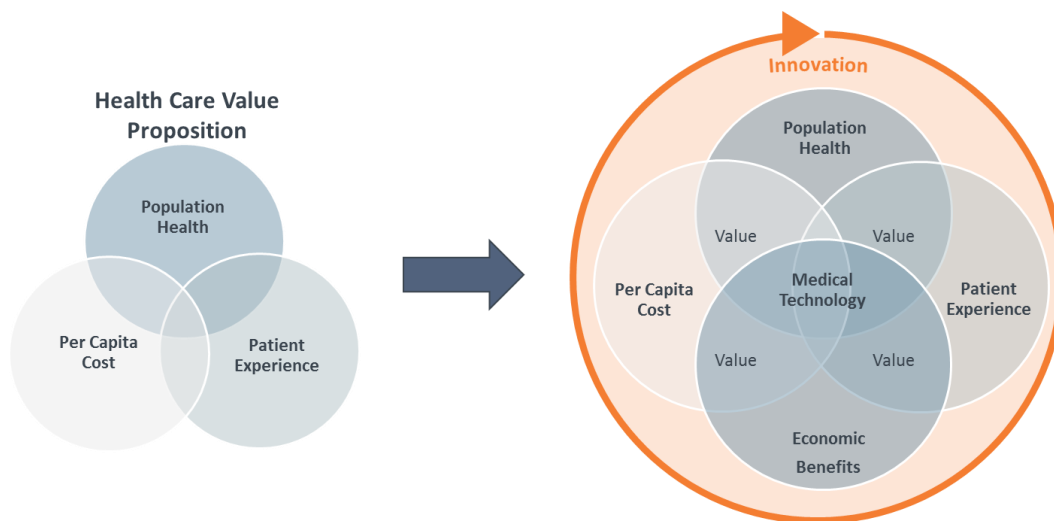
Medical technology companies provide a broad range of economic benefits, and the medical technology sector has the potential to be an even more significant economic driver. Beyond the benefits of skilled job creation, Gross Domestic Product growth and international trade, medical technology also brings the possibility of increased foreign investment to Canada. Ultimately, from an economic standpoint, medical technology provides Canada with an opportunity to be globally relevant in a competitive and cutting-edge industry.

**Alignment to the Triple Aim: How the Medical Technology Sector Contributes Value**

Medical technology is directly aligned with all Triple Aim components: population health, patient experience, and (per capita) cost. In addition to bringing value to patients, medical technology provides opportunities for cost savings through direct cost savings (e.g., shorter hospital stays) and indirect cost savings (e.g., from reduced need for ongoing treatment and fewer long-term complications). Increasingly, medical technology provides value to health systems by improving data on care quality and effectiveness for planning and management purposes. As noted above, medical technology companies also provide a broad range of economic benefits to Canada.

The healthcare system and medical technology sector share much in their respective quests for value. However, it is innovation that allows medical technology to support these goals. As Figure 2 shows, a device or medical technology can drive patient outcomes, cost savings, and broader economic and population benefits. Innovation is about supporting this constant drive to gain *greater* value and a drive for excellence in every aspect of the health system. While medical technology has always contributed to these efforts, it has not always been clear to the many system stakeholders what medical technology is and how it contributes to patient care and outcomes.

Figure 2: Innovating for Patients, the System and the Economy

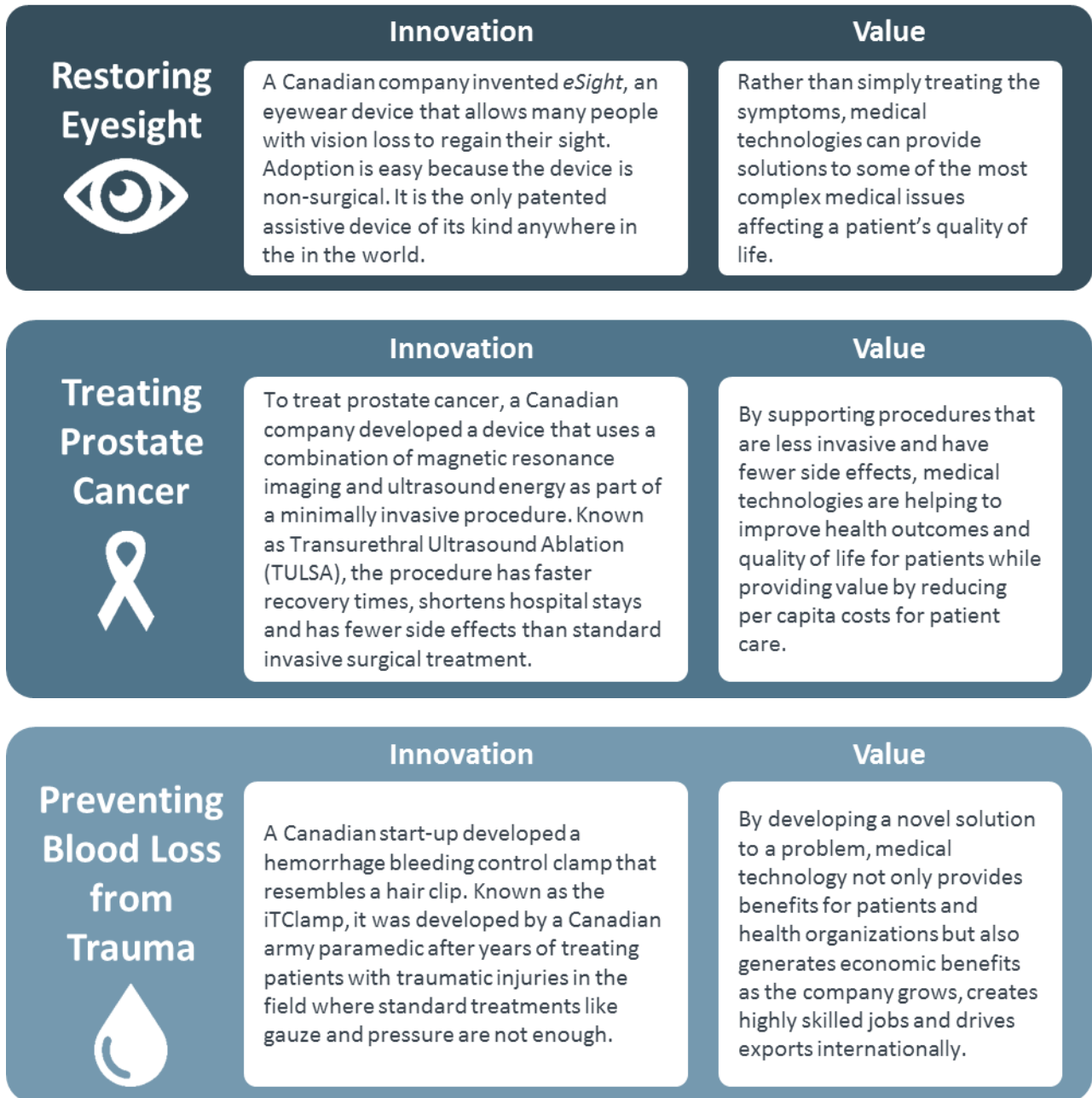


Like other areas of healthcare, medical technology has benefitted greatly from both incremental and disruptive innovation. Incremental innovation can be seen in devices like heart stents, which have evolved from simple pieces of metal to drug-eluting stents that slowly and automatically release drugs to the heart. In contrast, disruptive innovation makes once incurable conditions manageable, rendering old models of care unviable. For example, many symptoms of Parkinson’s disease can now be drastically and immediately eliminated with deep brain stimulation, made possible by an implanted neurological device. Innovation is expanding the capabilities of medical technology along multiple dimensions. Medical technology is now focused on the full breadth of patient outcomes, enabling patients to care for themselves and supporting cost savings for the system as a whole.

### Innovation and Value Case Studies

The case studies described in Figure 3 (see next page) demonstrate how innovative medical technologies are helping to harness value in different ways. By focusing on outcomes and moving from a passive to active role in healthcare, medical technologies are supporting better outcomes for patients, cost savings at a system level and economic benefits through locally-developed solutions.

Figure 3: Case Studies of Medical Technology and their Role in Delivering Value



	Innovation	Value
<b>Preventing Hospital-Acquired Infections</b> 	Canadian start-ups are using innovative medical technologies to combat the challenges and costs of hospital-acquired infections. One has developed a proprietary copper alloy-based spray coating known as Aereus Shield that acts as an anti-microbial agent. It can be sprayed on any metal or plastic surface in a hospital or care setting, can kill 99% of any germs present in 60 minutes and is the only product of its kind available in Canada. Another organization, BlueDot, aims to mitigate and minimize the impact of infectious diseases using geographic information systems, spatial analytics and data visualization solutions to inform improved decision making and risk management.	Preventative efforts not only enhance quality, but also support the sustainability of our system by reducing the costs required to treat unnecessary complications.

### What Medical Technology Innovation Means for Canada's Healthcare Systems

Innovation with a focus on the patient demands that the medical technology sector considers who uses these technologies and how medical technology is integrated into care delivery. While technologies have been primarily developed and adopted to improve care for patients, system stakeholders are now realizing that medical technology can also support broader system goals like improving access, improving broader population outcomes and reducing system costs. In order to assess the potential for medical technology to support these goals, it is important to consider not just the overall state of the medical technology sector in Canada, but also the state of the health system and how Canada fares in a global context.

## Current State of Medical Technology

### Current State of Medical Technology in Canada

A strong medical technology sector can improve outcomes, provide the best care to patients and support a more sustainable and effective healthcare system. Based on our analysis and interviews with industry, government, and thought leaders, Canada's medical technology sector is not realizing its potential, and in many cases it is stagnating.

#### Canada's Healthcare System in Need of Improvement

Overall, Canada is spending more on healthcare as compared to other developed countries. In 2015, total health expenditures in Canada were \$219 billion or \$6,105 per Canadian. This spending represents 10.9% of Canada's gross domestic product (GDP) – higher than the OECD average of 9%, and in the top quartile of international peer countries.

Despite the high level of spending, Canada continues to lag behind peer countries in terms of quality, access, efficiency and equity. As noted at the beginning of this paper, The Commonwealth Fund's most recent national health system scorecard ranked Canada 10<sup>th</sup> out of 11 peer countries, ahead only of the United States. Canada ranked second from the bottom for safe care, timeliness of care and efficiency – all areas where medical technology can improve performance. As Jeffrey Simpson puts it, "...our results are those of a Chevrolet compared with outcomes in countries with largely public systems, but we pay at Cadillac costs, since Canada stands near the top of the spending list of countries with largely public systems."<sup>4</sup>

The greatest drivers of healthcare spending are the cost of hospitals, treatment and services, as well as population growth and aging. Much of this spending is driven by a few areas within the system, with the three largest being hospitals (29.5%), pharmaceuticals (15.7%), and physician services (15.5%). Spending is continuing to grow nationally, although at a slower pace than in the past<sup>5</sup>. A 2011 analysis by Canadian Institute for Health Information indicated that cost drivers in Canada's healthcare systems are complex and intertwined, and vary across the country.

The same report noted that technological change involves two aspects: the introduction of new products (for example, new cancer drugs) and techniques (for example, bariatric surgery); and changes in clinical practices and patient demand due to the introduction of new products and techniques. The impact on overall spending is mixed. New technologies may increase costs in the short-term, however they can also be a major factor in reducing costs in the medium and long-terms if total cost of care is decreased by replacing a more expensive treatment, curing a chronic disease or decreasing treatment cost<sup>6</sup>.

## Spending on Medical Technology in Canada

Canada's high level of healthcare spending has created significant pressure to reduce costs and achieve increased value for money. While the medical technology sector should not be exempt from this focus on value, it needs to be better understood that making investments in medical technology and harnessing the value of technology can be a source of both value and cost savings across the system over time.

The overall size of the medical device market has remained relatively stable over the last few years. From 2010 to 2012, the sector grew from USD\$5.9 billion dollars to nearly USD\$7 billion dollars. Since then, it has actually contracted to USD\$6.5 billion dollars (as of 2015). Much of the recent industry growth has been driven by increasing levels of imports, which have, with the exception of 2010, grown every year since 2005.<sup>7</sup> However, given the increased expenditures across many of the areas noted earlier, such as hospitals and physician services, medical device spending makes up a shrinking proportion of health expenditures in Canada.

At just 3% of overall Canadian health system spending, medical technology offers limited direct potential for overall system savings through ongoing price reductions. It would be more worthwhile for governments to focus on the role that medical technology can play in enabling a value-based healthcare approach that supports sustainability and efficiency.

While Canada spends significantly more than the OECD average on healthcare overall, it spends well below the average on medical technology relative to an even wider set of peer countries. In examining the proportion of healthcare expenditures specifically devoted to medical technology, the Canadian Health Policy Institute places Canada 60<sup>th</sup> out of 72 countries, and 23<sup>rd</sup> out of 25 of its OECD peers, with Germany, Japan, the UK, and Israel ahead of us, among others.<sup>8</sup>

Together with stagnating real spending, industry stakeholders indicate that price erosion has been a part of the Canadian medical technology sector story in recent years. This is a natural consequence of both efficiency gains from reduced technology costs, as well as health system efforts to reduce spending on healthcare overall through increased purchasing power and procurement initiatives.

## Medical Technology and Economic Development

Beyond its potential to support health system challenges, there is widespread agreement that innovation in medical technology has a critical role to play in Canada's economic development and future prosperity. Indeed, knowledge, innovation and technological change have transformed Western economies over not just decades but centuries.<sup>9</sup> Governments across Canada at the federal, provincial and municipal levels recognize that this must continue, and are committed to supporting Canada's innovation economy. When announcing a \$15 million investment in York University and Southlake Regional Health Centre in July 2016, the Honourable Navdeep Bains, Federal Minister of Innovation, Science and Economic Development, noted:

*[We are] committed to positioning Canada as a global centre for innovation – one that creates well-paying jobs for Canadians...while also helping to foster a thriving middle class, drive growth across all industries and improve the lives of all Canadians...The most innovative solutions often happen when people from different fields collaborate. That's why it's important for universities, healthcare providers, the business community and government to work together. That's how we will come up with health-care solutions that improve the quality of life for Canadians.<sup>10</sup>*

Given this government support – at least in principle – it is natural to ask: what role is medical technology currently playing in Canada's innovation economy? It is worth asking...

- Why is it that only a handful of the 4,000 medical device and technology products that gain Health Canada approval end up in the hands of clinicians and patients?
- While there are many products that support patient outcomes, system quality and sustainability, why are they not currently available in Canada?

In considering the challenges facing healthcare in Canada, we need to ensure that all parts of our system are working together to support innovation, sustainability, and the realization of value.

## The Value Gap in Canada

As recognition and attention of Canada's healthcare challenges continues to grow, so have calls to draw on innovation and medical technology to tackle them. These appeals for innovation have come from a wide range of voices, including government-commissioned expert panels (Naylor Report<sup>11</sup>), think tanks (Conference Board of Canada<sup>12</sup>), academic institutions (Ivey Centre for Health Innovation<sup>13</sup> and Institute for Health Economics<sup>14</sup>), journalists<sup>15</sup>, and political leaders<sup>16</sup>. Federal Minister of Health, Jane Philpott, noted recently that "...the problems facing Canada's healthcare system will not be solved by just spending more money, [but through innovation]."<sup>17</sup>

Prominent stakeholders and thought leaders recognize that Canada is leaving value on the table at a time when the country can least afford to do so. This raises questions about how all the value that Canada's medical technology sector can provide might be captured, not just for patients and the healthcare system, but for the economy as a whole.

### Canada's Market Challenge

From an international perspective, with a population of 35 million people and GDP of about \$2 trillion, Canada is a small market. Canada ranks 9th in medical technology sales globally, accounting for about 2 percent of the global market.<sup>18</sup> Canada's medical technology market is similar in size to Russia's, but smaller than those of other advanced economies such as Italy, the United Kingdom, and France, among others. The United States is by far the largest market for medical technology, accounting for nearly 40% of global sales and over US\$119 billion. While Chinese per capita spending remains low in absolute terms at US\$10.5 billion, the market is the 4th largest in the world in 2012, and is forecasted to become the second largest by 2017.<sup>19</sup>

Market sizes influence how large multi-national enterprises (MNEs) set many of their priorities. While small and medium enterprises (SMEs) comprise the majority of Canada's medical technology companies, Canada's medical technology market is dominated by MNEs in terms of revenue.<sup>20</sup> SMEs can play an important role in Canada's innovation economy (more on this below), but MNEs are critical to bringing new and innovative products to Canadian patients in both the short and long term. MNEs make investments in the Canadian economy through employment, manufacturing, research and development. However, it was noted in the key informant interviews with MNEs that Canada is increasingly viewed as a third tier market for investment.

"Why should we invest in Canada when the market is small, prices are eroding, and the future is unclear?"

— VP, Large Multi-National Medical Technology Enterprise

Given the country's small market size, price pressures and adoption challenges, Canadian managers confirmed that it is increasingly difficult to advocate globally within MNEs for investments in Canada. Interviews with MNEs noted reductions in their presence in Canada in recent years (via plant closures), and are choosing to launch their products in Europe or the United States and not bring them to Canada. This lack of investment extends to other high-value areas in research and development.

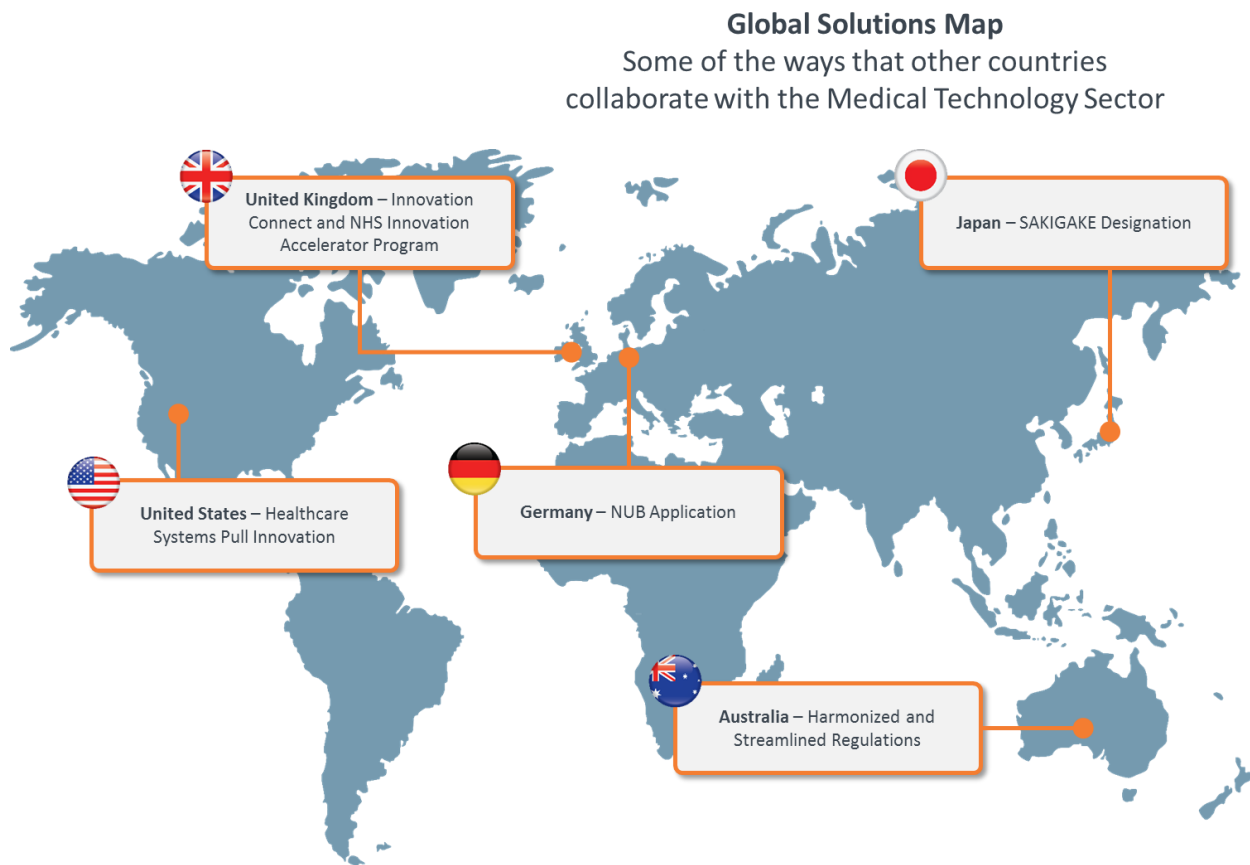
The most important consequence of this trend is that Canadians do not have access to the same innovative technologies as other patients in higher priority markets. For example, glucose monitors that do not use a needle or draw blood now exist for patients with diabetes, which improves the patient experience by allowing self-managed care. Today, these meters are available in the UK, France, Germany, Italy, the Netherlands, Spain, and Sweden, but not in Canada.<sup>21,22</sup>



## Current Status of Medical Technology in Other Countries






### Support for Medical Technology Innovation in Other Countries

What have other countries done to either avoid or address these challenges of collaboration between the public and private sectors? As described earlier, medical technology plays a larger role in the health systems of Canada's peers in the OECD and elsewhere. In a number of different ways, other countries like the UK<sup>23</sup>, the United States<sup>24</sup>, Germany<sup>25</sup>, Australia<sup>26</sup>, and Japan<sup>27</sup> work collaboratively with the medical technology sector to support the adoption of innovation.



The following is a synopsis of value-based healthcare approaches in five countries where there is collaboration between health system stakeholders or governments and the medical technology sector to adopt innovation and achieve better outcomes.

Table 2: Synopsis of Value-Based Health Solutions from Around the World

Country	Challenge	Solution
<b>United Kingdom</b> 	Access to innovative treatments for patients	<p><b>UK enables adoption to strengthen the medical technology sector as an economic driver.</b></p> <p>Through the creation of Innovation Connect and the NHS Innovation Accelerator Program, the UK is trying to fast-track innovation to give patients more access to emerging innovative technology as well as address the conditions and cultural change needed to scale these innovations and impacts across the system.</p>
<b>Japan</b> 	Strength in basic research led to many discoveries that were not being developed and commercialized	<p><b>SAKIGAKE strategy includes a designation system and accelerates the adoption of local innovation.</b></p> <p>The strategy promotes R&amp;D in Japan by focusing on early practical applications for innovative medical devices. The SAKIGAKE designation allows innovative products that meet an urgent clinical need and demonstrate substantial improvement over conventional therapies in early clinical trials to undergo an accelerated review to support rapid clinical adoption with appropriate post-marketing efficacy and safety monitoring.</p>
<b>Germany</b> 	Lengthy gaps between regulatory approval and reimbursement	<p><b>The NUB Application provides a gateway for innovative medical devices to get rapid reimbursement and an entry point into the healthcare system.</b></p> <p>If approved through the NUB application, innovative technologies are eligible for short-term reimbursement. This provides hospitals with the financial incentive to use new devices while collecting data on the device's impact and value.</p>
<b>Australia</b> 	Small domestic market	<p><b>Australia compensates for its small domestic market by reducing red tape and minimizing regulatory burden for business.</b></p> <p>Streamlined and simplified regulations make conducting clinical trials simpler and less expensive in Australia than other jurisdictions. Additionally, the ability to market some products in Australia with a CE certification reduces regulatory burden and/or speeds regulatory approval and increases access of innovative technology to patients.</p>
<b>United States</b> 	Systems and cultures reinforce the status quo and impede the adoption of innovation	<p><b>Kaiser Permanente creates a culture of innovation</b></p> <p>This California-based health system has been able to create a culture of continuous innovation through arming front-line staff and clinicians with actionable information, developing an innovation infrastructure such as the Garfield Innovation Center to support prototyping and evaluation and promoting cross-learning and scaling across the system.</p>

## Issues and Challenges

The structure of Canada's healthcare systems, level of spending, and small market size are to a large degree fixed structural features of the landscape in which the medical technology sector operates. But other factors, such as the role of leadership and collaboration between the public and private sectors, are more easily influenced.

## Research Findings

The literature reviews and interviews completed for this paper identified four consistent themes about why Canada has been so poor at supporting and adopting innovation. These are:

- 1) System structures that hinder widespread adoption of innovation
- 2) Public and private sectors with differing cultures around innovation adoption
- 3) A lack of trust between the public and private sectors
- 4) Limited and dispersed leadership to drive change and adoption of innovation

These barriers and their implications are described more fully in Table 3 below. These challenges are widespread and not limited to a single element of Canada's health system. They not only impede medical technology innovation, but also the ability of the country's economy to foster, support and encourage innovation more broadly.

"Fundamentally our systems were not designed to innovate. They were designed to minimize risk."  
– Health Commercialization Expert

To fully support the adoption of innovation in a meaningful way, stakeholders across sectors will need to address these underlying challenges with jointly-developed solutions. Efforts to harness innovation must include a comprehensive and coordinated approach between the medical technology sector and health system stakeholders in order to overcome systemic, structural and cultural barriers.

Table 3: Barriers to Innovation in Canada

Barrier	Examples
System structures that hinder widespread adoption of innovation	<ul style="list-style-type: none"> <li>▪ Regulatory processes are slower and more cumbersome relative to other countries. There is also limited harmonization with other countries.</li> <li>▪ Procurement has contributed to some of the lowest medical technology prices in the world, which has in turn contributed to the current stagnation in the medical technology industry.</li> <li>▪ Health technology assessment processes are not supportive of SMEs due to time, cost, and data requirements.</li> <li>▪ Pricing and reimbursement decisions in Canada are highly decentralised to hospitals and group purchasing organizations (GPOs), creating a complex and fragmented market.</li> </ul>
Cultures in the public and private sector that deter innovation adoption	<ul style="list-style-type: none"> <li>▪ Culture among MNEs is often to develop products in other markets which are then brought to Canada, rather than supporting the development of devices directly within the Canadian system.</li> <li>▪ The nature of procurement is to focus on short-term savings, which has led to a culture of risk-aversion across hospitals and GPOs.</li> <li>▪ Most clinical workflows are not able to absorb and use new innovations. For example, billing codes are not updated for remote monitoring, encouraging doctors to continue to see patients in person and reducing efficiency.</li> </ul>
A lack of trust between the public and private sectors	<ul style="list-style-type: none"> <li>▪ Industry has often focused their efforts on regulatory and reimbursement issues, rather than engaging on broader system challenges.</li> <li>▪ There has been limited involvement of industry in system planning and needs assessment, resulting in products that do not always meet system needs.</li> <li>▪ System policymakers have been wary to engage too often or too directly with the private sector.</li> </ul>
Limited and dispersed leadership driving change and the adoption of innovation	<ul style="list-style-type: none"> <li>▪ Not enough individuals in both the public and private sectors challenge the status quo and strengthen government/industry collaboration.</li> <li>▪ Successful transformations have had leaders who are willing to break through structures and support cultures of innovation.</li> <li>▪ Many MNEs view Canada as a third tier market and are less willing to launch new products or invest in research and development in Canada.</li> </ul>

## Diverging Government Priorities

Government priorities for the healthcare system are being challenged as systems at all levels try to stimulate innovation, contain costs and ensure system sustainability and affordability.

On the one hand, governments are promoting innovation through:

- Basic research organizations like the Natural Sciences and Engineering Research Council (NSERC) and Canadian Institutes for Health Research (CIHR).
- Economic development and innovation ministries providing a policy environment for small and innovative companies to scale up.
- Alberta Innovates or MaRS EXCITE in Ontario that support more rapid adoption of innovation.
- Agencies like the Ontario Capital Growth Corporation working to catalyze access to venture capital.
- Export agencies helping to facilitate the sales of Canadian technology globally.

On the other hand, there are provincial ministries of health, regional health authorities, assessment agencies, group purchasing organizations and health service providers, all focused on reducing spending on medical technology to balance constrained annual operating budgets.

While an increased focus on accountability is welcome, procurement is siloed and unable to reflect the overall system impacts of medical technology investment.

“We need to shift from focusing on rules to focusing on principles. As organizations focused on patients, [industry and government] share the same principles”

– Provincial HTA Leader

## Missed Opportunities for Canada's Innovation Economy

Stagnating sector spending has implications for Canada's innovation economy. With a market of CAD\$6 billion, Canada's medical technology sector is a small piece of the USD\$327 billion global market, creating challenges to nurture home grown companies or attract investment from MNEs. This reality is exacerbated by Canada's siloed and divergent government priorities. The results are missed opportunities to cultivate innovation within Canadian companies, and attract foreign investment.

The irony is that Canada has the foundations in place for a strong sector. Interviewees and research reports identified that Canada has many of the prerequisites for a robust medical technology sector:

- an attractive and stable tax environment;
- research and development support;
- world-class universities, research institutes, hospitals; and;
- a diverse and multicultural population.

"Can Canada be a market for innovation in medical technology? Absolutely, but the way it is being supported now is simply not adequate."

— Senior Provincial Policymaker

In terms of the number of companies, the sector is dominated by SMEs, many of which are Canadian.<sup>28</sup> However, despite the innovative products developed by these locally-grown companies, Canada's medical technology market is primarily import-based (80%).<sup>29</sup> Small Canadian medical technology companies are often not able to break into their local markets. Without home market customers or case studies, these companies are immensely challenged in securing domestic and foreign investment or breaking into international markets.

## How Does Canada Move Forward?

Stagnating spending, a small market, and diverging government priorities are turning the medical technology sector into a sidelined player in Canada's health system and its economy. Consequently, it is not able to play the role that it could or should. This is a detriment to Canada's economy, health systems and improved outcomes, and most importantly, to patients across the country.

This raises the following questions:

- *How can Canada better support commercialization and adoption of innovative medical technologies?*
- *How can medical technology help harness greater value for patients and patient outcomes, for health systems, and for the economy? What needs to change? How does Canada move forward?*

## The Future of Medical Technology in Canada

### The Promise of Collaborative Innovation in Canada

Encouragingly, health systems in Canada and beyond are beginning to recognize the potential of medical technology and are making promising strides to harness its value more effectively. For example, progress is being made to shift the emphasis in procurement from short-term cost-savings to longer term system savings.<sup>30</sup> Models such as Value-Based Procurement<sup>31</sup> and the Most Economically Advantageous Tender<sup>32</sup> both outline structures and processes to help ensure that medical technologies and other devices are assessed based on how much value they bring to the system overall, rather than just their price.

“The concept of policymaker ‘versus’ industry is so dated. We need to move beyond this and work together”  
– Senior Health System Official

In Canada, efforts to realize more value can also be found from coast to coast, ranging from start-up accelerators to the appointment of health innovation officers (see Figure 4 below). All of these initiatives not only support greater value, but are also focused on tackling the barriers noted earlier – systems and structures that limit appetite for innovation, risk averse cultures, a lack of trust, and limited, dispersed leadership.

While these efforts will support greater value for patients and health systems, Canada will not be able to harness all of the value from medical technology if the deeper challenges noted earlier are not addressed. Structures and processes, like procurement and health technology assessments, are crucial elements of the system that need to be designed and managed to focus on value. Without consistent implementation across the country, these reforms will barely make a dent in existing challenges to innovation.

“To be relevant at a global level, Canada needs to be known as the place where innovations are tested early and adopted readily.”  
– Senior Health System Official

This is the current innovation dilemma – is Canada willing to embrace the medical technology sector as a key contributor to health system value-based approaches?

Figure 4: A Solutions Map of Promising Medical Technology Innovation Initiatives in Canada

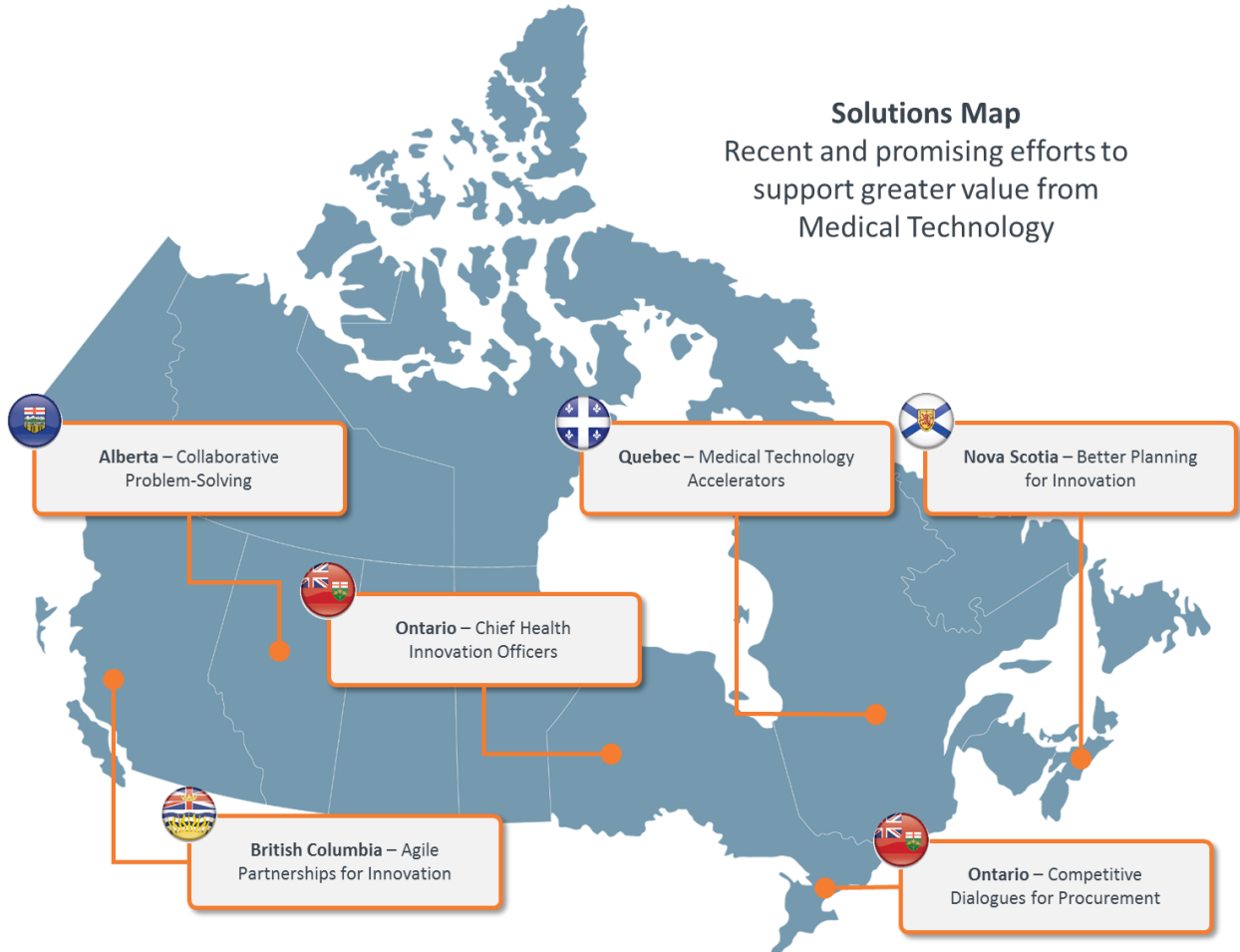










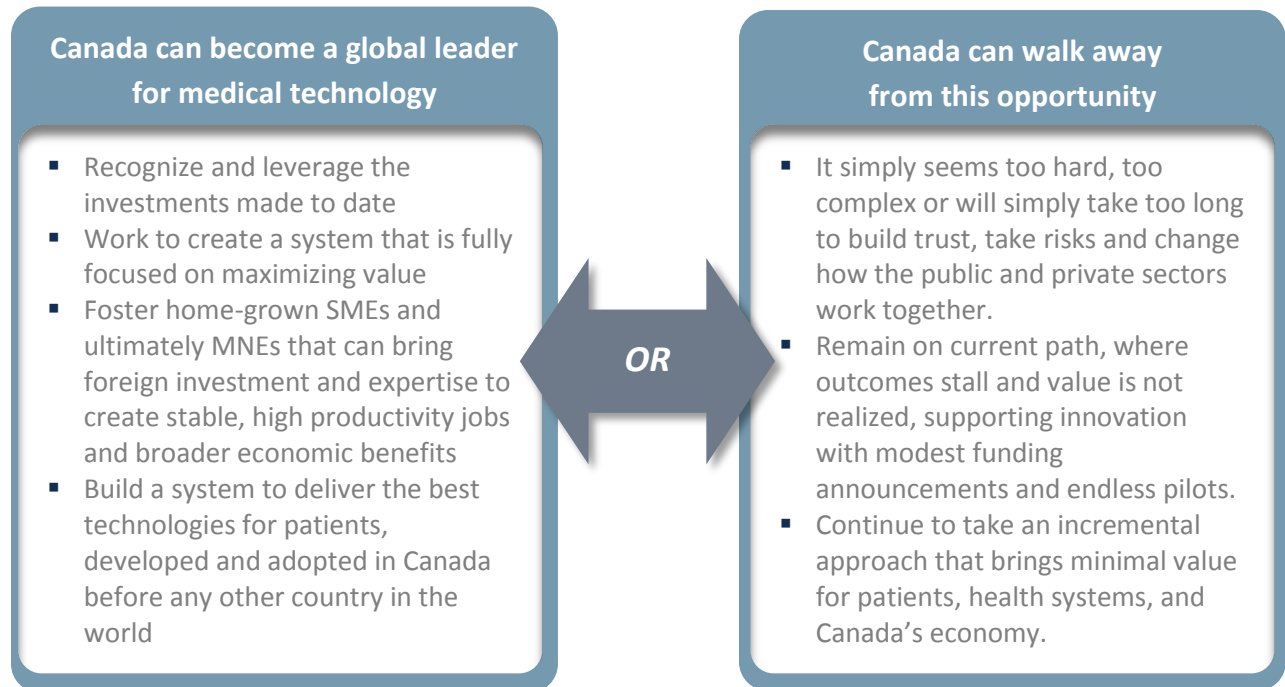
Table 4: Examples of Recent Provincial Initiatives to Support the Adoption of Innovation

Province	Innovative Initiative
<b>British Columbia</b> 	<b>Agile Partnerships for Innovation</b> An agile partnership of health, business, higher education and government creating new health technologies to improve peoples' lives. Focus is on 3 technology areas: medical devices, independent living and digital health.
<b>Alberta</b> 	<b>Collaborative Problem-Solving</b> Strategic Clinical Networks (SCNs) are a structure that align public, private and clinical stakeholders to accelerate the adoption of technological innovations that not only improve the quality of care for Albertans, but are cost-effective for the health system. Techniques include collaborative problem-solving and the development of medical technologies to address local issues.
<b>Ontario</b> 	<b>Chief Health Innovation Officer</b> The Ontario government established the Office of the Chief Health Innovation Strategist in 2015. It aims to be a catalyst for health technology commercialization efforts in Ontario.
<b>Ontario</b> 	<b>Competitive Dialogues for Procurement</b> Southlake Regional Health Centre in Ontario uses their culture of innovation to support procurement processes that emphasize outcomes-based specifications, and can include competitive dialogues with potential vendors to deliver significant added value for patients, for the facility, and ultimately for the system.
<b>Quebec</b> 	<b>Medical Technology Accelerators</b> CTS Santé, a medical accelerator, was recently launched to help support medical device founders accelerate early prototypes through initial market penetration.
<b>Nova Scotia</b> 	<b>Better Planning for Innovation</b> The Nova Scotia Department of Health & Wellness announced a plan to develop a Nova Scotia Health Innovation Strategy, which aims to leverage the health sector as an economic driver through the development of partnerships and private enterprise ventures.

## Vision for Medical Technology in Canada

### Canada's Innovation Dilemma & Critical Next Steps

Ultimately, Canada has a decision to make about the role of medical technology. All stakeholders need to reflect and decide if they are fully committed to supporting a strong medical technology sector so that all Canadians can benefit.



Making a choice is not just saying 'yes' to the vision described on the left above but working to move Canada's health systems away from the status quo. It also means committing to working with partners (both old and new) to support this transition, and a renewed approach to how innovation is supported across all aspects of the health system. The public and medical technology sectors must make these commitments together. If both the public and private sectors want the medical technology sector to grow productively, then they need to take the critical steps outlined below in Table 3.

Table 5: Critical Next Steps for Canada

Issue	Solution
<p><b>Fragmented and Inflexible Systems</b> Many system structures within the health system, including reporting, funding mechanisms and communication platforms are not integrated or aligned between and across organizations. These structures are designed to reinforce and maintain the status quo and can be a barrier to the adoption and integration of innovation.</p>	<p><b>Address System Challenges Through Collaborative Planning and Transformation</b> Ensure that system planning and transformation efforts engage a diverse group of stakeholders and facilitate meaningful collaboration between organizations to drive change.</p>
<p><b>A Short-Sighted Focus on Short-Term Savings</b> An overall focus on short-term cost savings has limited the ability of health systems to gain long-term value for patients and enhance system sustainability.</p>	<p><b>Focus on Total Cost of Care and Long-Term Savings</b> Align reporting and incentive structures so that long-term patient and system benefits drive decision making.</p>
<p><b>Cultural Resistance to Innovation</b> There are currently a number of siloed parties operating within the healthcare sector. There is also limited coordination of the system to change behavior among clinicians and health service providers that supports the adoption of innovation.</p>	<p><b>Incorporate Change Management to Support Innovation Adoption</b> Utilize change management principles to support the scale-up and spread of innovative technologies across health organizations.</p>
<p><b>Lack of Trust</b> Trust is a fundamental element to supporting the adoption of innovation. There is a lack of trust and transparent collaboration between the public and medical technology sectors.</p>	<p><b>Build Collaborative and Transparent Working Relationships</b> Building trust starts with greater dialogue and transparent communication from both the public and medical technology sector. Both sides can be more active in engaging with each other to identify problems and co-develop meaningful solutions where there is shared benefit.</p>
<p><b>Risk Aversion</b> More risk-taking is needed to support innovation and the adoption of solutions that can bring greater value; too many of our current challenges are rooted in an inability to shift from the status quo.</p>	<p><b>Enable Risk-Taking Through New Models</b> Both sectors need to take some risks they have historically been reluctant to take to allow for innovation to be supported at all levels of the system. Both sectors should also consider how they can enable new models of procurement (such as risk-sharing, or competitive dialogues) to find better solutions for patients and harness more value for Canada.</p>

Canada's healthcare systems are in need of solutions that will continue to make them sustainable for future generations. This will require thinking differently about the role of medical technology in Canada's healthcare system, and building smart and more collaborative relationships between government, health system stakeholders and the medical technology sectors for the benefit of patients.

"Stories inspire people. Stories create momentum. We need to speak louder and more often about Canadian successes and the advantages of our market"  
– *Senior Government Official*

Only then can Canada harness all of medical technology's potential for innovation, economic growth, system sustainability and patient outcomes. More than ever before, Canada has the opportunity to truly make a transformational change and become a global leader.

## Conclusion

Canada's healthcare system is faced with a dilemma. Unless strategic changes with concrete plans are established, the country's publicly-funded health systems will continue to struggle with health system transformation efforts aimed at driving value that includes improved population and patient outcomes, a more effective, efficient and sustainable health system, and recognizing innovation as a key contributor to the economy. Canada spends too much money for the health outcomes it achieves relative to other countries. On its own, the cost curve cannot be bent sufficiently through procurement or spending controls to deliver improved outcomes, realize health system value, and support innovation and economic prosperity.

Yet, most importantly, it is recognized that Canada has many of the value-based tools to address the challenges facing the health system, with medical technology and innovation among the most powerful of them. Medical technology is a critical component to achieving better health outcomes through the adoption of innovation. The medical technology sector is well positioned to address these health system challenges and contribute to Canada's future health and economic prosperity.

## Citations

- <sup>1</sup> Whittington, John W., Kevin Nolan, Nino Lewsi, and Trissa Torres (2015). Pursuing the Triple Aim: The First 7 Years. *The Milbank Quarterly*, 93(2), pp. 263-300.
- <sup>2</sup> Porter, M. & Teisberg, E.O. (2006) Redefining Health Care: Creating Value-based Competition on Results. Harvard University Press.
- <sup>3</sup> Marchildon, G. & Di Matteo, L. (2014). Bending the cost curve in health care: Canada's provinces in international perspective. University of Toronto Press.
- <sup>4</sup> Simpson, Jeffrey (2012). *Chronic Condition: Why Canada's Health Care System Needs To Be Dragged Into the 21<sup>st</sup> Century*. Toronto: Penguin Canada.
- <sup>5</sup> Canadian Institute for Health Information (2015). National Health Expenditure Trends, 1975 to 2015. [online: web] URL: [https://www.cihi.ca/sites/default/files/document/nhex\\_trends\\_narrative\\_report\\_2015\\_en.pdf](https://www.cihi.ca/sites/default/files/document/nhex_trends_narrative_report_2015_en.pdf)
- <sup>6</sup> Canadian Institute for Health Information (2011). Health Care Cost Drivers: The Facts. [online: web] URL: [https://secure.cihi.ca/free\\_products/health\\_care\\_cost\\_drivers\\_the\\_facts\\_en.pdf](https://secure.cihi.ca/free_products/health_care_cost_drivers_the_facts_en.pdf).
- <sup>7</sup> Business Monitor International (2016). Canada Medical Devices Report: Q4 2016. Business Monitor International
- <sup>8</sup> Canadian Health Policy Institute (2015). Medical devices and health care costs in Canada and 71 other countries 2009-2014.
- <sup>9</sup> Helpman, Elhanan (2004). *The Mystery of Economic Growth*. Cambridge: Harvard University Press.
- <sup>10</sup> Government of Canada (2016). FedDev Ontario Invests in Healthcare Innovation. July 21, 2016. [online: web] URL: <http://news.gc.ca/web/article-en.do?nid=1102419>.
- <sup>11</sup> Advisory Panel on Healthcare Innovation (2015). Unleashing Innovation: Excellent Healthcare for Canada. Health Canada
- <sup>12</sup> Conference Board of Canada (2016). Value-Based Procurement: The New Health Care Imperative. Conference Board of Canada.
- <sup>13</sup> Snowdon, A., & Cohen, J. (2011). Strengthening Health Systems Through Innovation: Lessons Learned Ivey Centre for Health Innovation, Richard Ivey School of Business, Western University
- <sup>14</sup> Institute for Health Economics (2015). Partnering for Health System Innovation in Alberta. Summary Report for SCN/MEDEC Engagement-Final Report. Available from: <http://www.ihe.ca/publications/partnering-for-health-system-innovation-in-alberta-summary-report-from-scn-medec-engagement-ndash-final-report>
- <sup>15</sup> Givetash, L. (2014) Innovation is key to future of B.C. health-care system. The Georgia Straight. Mary 27, 2014 [online: web] URL: <http://www.straight.com/life/652311/innovation-key-future-bc-health-care-system>
- <sup>16</sup> Fitzpatrick, M. (2012). Premiers join forces on health innovation group. CBC News: Politics 2014 [online: web] URL: <http://www.cbc.ca/news/politics/premiers-join-forces-on-health-innovation-group-1.1134517>
- <sup>17</sup> Government of Canada (2016). Remarks from the Honourable Jane Philpott, Minister of Health, to the Canadian Medical Association Annual General Meeting - August 23, 2016 [online: web] URL: <http://www.cbc.ca/news/politics/premiers-join-forces-on-health-innovation-group-1.1134517>
- <sup>18</sup> Innovation, Science, and Economic Development Canada (2013) Medical devices industry profile [online: web] URL: [https://www.ic.gc.ca/eic/site/lsg-pdsv.nsf/eng/h\\_hn01736.html](https://www.ic.gc.ca/eic/site/lsg-pdsv.nsf/eng/h_hn01736.html)
- <sup>19</sup> Ibid.
- <sup>20</sup> Innovation, Science, and Economic Development Canada (2013) Medical devices industry profile [online: web] URL: [https://www.ic.gc.ca/eic/site/lsg-pdsv.nsf/eng/h\\_hn01736.html](https://www.ic.gc.ca/eic/site/lsg-pdsv.nsf/eng/h_hn01736.html)
- <sup>21</sup> Qaadri, S. (2014). Blood sugar testing goes wireless, painless for diabetes patients. The Globe and Mail. Published Oct. 9<sup>th</sup>, 2014. [online: web] URL: <http://www.theglobeandmail.com/life/health-and-fitness/health-advisor/blood-sugar-testing-goes-wireless-painless-for-diabetes-patients/article21021695/>
- <sup>22</sup> Brown, A. & Close K. (2015) Abbott's FreeStyle Libre- Transforming Glucose Monitoring Through Utter Simplicity, Fingersticks Aside! [online: web] URL: <https://diatribe.org/abbott-freestyle-libre-transforming-glucose-monitoring-through-utter-simplicity-fingersticks>
- <sup>23</sup> NHS. NHS Innovation Accelerator. [online: web] URL: <https://www.england.nhs.uk/ourwork/innovation/nia/>
- <sup>24</sup> Halvorson, George (2013). The Culture to Cultivate. [online: web] URL: <https://hbr.org/2013/07/the-culture-to-cultivate>
- <sup>25</sup> Germany Trade & Invest (2015). Reimbursement of medical devices in Germany. [online: web] URL: [http://www.exportinitiative-gesundheitswirtschaft.de/EIG/Redaktion/EN/Publikationen/2015-06-12-hmg-publication-reimbursement-medical-devices-englisch.pdf?\\_\\_blob=publicationFile&v=5](http://www.exportinitiative-gesundheitswirtschaft.de/EIG/Redaktion/EN/Publikationen/2015-06-12-hmg-publication-reimbursement-medical-devices-englisch.pdf?__blob=publicationFile&v=5)

---

<sup>26</sup> Government of Australia Therapeutic Goods Administration (2014). Conformity assessment requirements for Australian medical device manufacturers - streamlining requirements. [online: web] URL: <https://www.tga.gov.au/conformity-assessment-requirements-australian-medical-device-manufacturers-streamlining-requirements>

<sup>27</sup> Ministry of Health, Labour and Welfare (2014). Strategy of Sakigake. [online: web] URL:

<http://www.mhlw.go.jp/english/policy/health-medical/pharmaceuticals/dl/140729-01-01.pdf>

<sup>28</sup> Innovation, Science, and Economic Development Canada (2013) Medical devices industry profile [online: web] URL:

[https://www.ic.gc.ca/eic/site/lsg-pdsv.nsf/eng/h\\_hn01736.html](https://www.ic.gc.ca/eic/site/lsg-pdsv.nsf/eng/h_hn01736.html)

<sup>29</sup> Business Monitor International (2016). Canada Medical Devices Report: Q4 2016. Business Monitor International

<sup>30</sup> Gerecke, G., Clawson, J., & Verboven, Y. (2015) Procurement: The Unexpected Driver of Value-Based Health Care. Boston Consulting Group

<sup>31</sup> Conference Board of Canada (2016). Value-Based Procurement: The New Health Care Imperative. Conference Board of Canada.

<sup>32</sup> MedTech Europe (2016). MEAT and Value-Based Procurement: Driving Value-Based Healthcare in Europe Event Report. MedTech Europe.





