

EDMONTON IS CANADA'S HEALTH CITY

Transforming Lives and Driving Growth



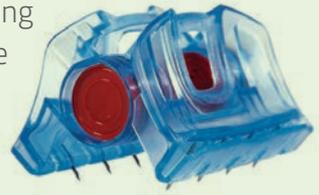
REALIZING OUR POTENTIAL

Growing Edmonton's Health Industry

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DR. DENNIS FILIPS STORY

As a surgeon with the Canadian Forces for 20 years, Dr. Dennis Filips saw his fair share of trauma. After three tours in Afghanistan, the Edmonton native was keenly aware of a simple, and awful, truth, that hemorrhaging is one of the leading causes of preventable death. Moved by his experience, he was determined to do something about it.



His solution? An ingeniously simple device resembling a hair clip that seals the area around a wound by clamping the skin together. It's known as the iTClamp Hemorrhage Control System. The idea is based on a complex suture pattern. All a person needs to do to work the clamp is pick up it, put it on the skin, and squeeze it closed. The device's engineering does the rest, replicating all the things a doctor would do. **Where did this innovation happen?** Edmonton.

After winning TEC Edmonton's VenturePrize for his idea, Dr. Filips developed the iTClamp with the help of the local tech community. "Being grounded here in Edmonton, getting international experience, and being able to come back and work with the local community has been certainly integral in achieving this," he later recounted.¹

Today, the device is helping to save lives around the world. Since its initial approval by Health Canada in 2012, iTClamp has been cleared for use in dozens of countries, including the United States, Australia, and members of the European Union.

Edmonton wasn't just the site of the invention; it provided the supportive environment that made it possible.

It's difficult to imagine how different life would be without the fruits of modern medical science. From antibiotics that combat the simple infections that killed millions in previous generations, to pacemakers that help control abnormal heart rhythms, to CT scans that allow

physicians to more accurately diagnose diseases, countless people are leading lives that wouldn't otherwise be possible.

The health industry – which is made up of the pharmaceutical, biotechnology, and medical technology sectors – is more than a source of transformative medical innovations; it's also a global economic driver. By 2019, its revenues are expected to top \$2.2 trillion², the industry is largely resistant to the economic pressures and instability that have affected so many other sectors, particularly energy.

The reasons for this stem from the evolving nature of health care. Around the world, the prevalence of chronic diseases is on the rise. In 2001, chronic diseases were responsible for 46 per cent of the global burden of disease. By 2020, that rate is expected to increase to 57 per cent.³ The global population is also getting older, with the number of seniors expected to more than double to 1.6 billion by 2050.⁴

Together, these changes are driving health care expenditures ever higher. Looking to contain costs, government and other health care providers are increasingly looking to medical innovations, which represents an unprecedented market opportunity for the health industry.

¹ Metro News, August 26, 2014, <http://www.metronews.ca/news/edmonton/2014/08/26/edmonton-innovator-go-global-with-unique-hemorrhage-clamp.html>.

² Deloitte, 2016 Global Life Sciences Outlook: Moving Forward with Cautious Optimism, <http://www2.deloitte.com/content/dam/Deloitte/global/Documents/Life-Sciences-Health-Care/gx-lshc-2016-life-sciences-outlook.pdf>.

³ The World Health Organization, http://www.who.int/nutrition/topics/2_background/en

⁴ National Institute on Aging, An Aging World: 2015, <http://www.census.gov/content/dam/Census/library/publications/2016/demo/p95-16-1.pdf>.

THE EDMONTON ADVANTAGE

Boston, San Francisco, and Minneapolis may be the centres traditionally associated with health care innovation, but as the story of Dr. Filipis and the iTClamp demonstrates, Edmonton is an emerging player with global reach. From medical devices to pharmaceuticals to industrial and agricultural biotechnology, the city is home to a dynamic health sector featuring both established multinationals and energetic local start-ups.

EDMONTON'S COMPETITIVE EDGE IS MADE UP OF FOUR KEY ADVANTAGES:

1

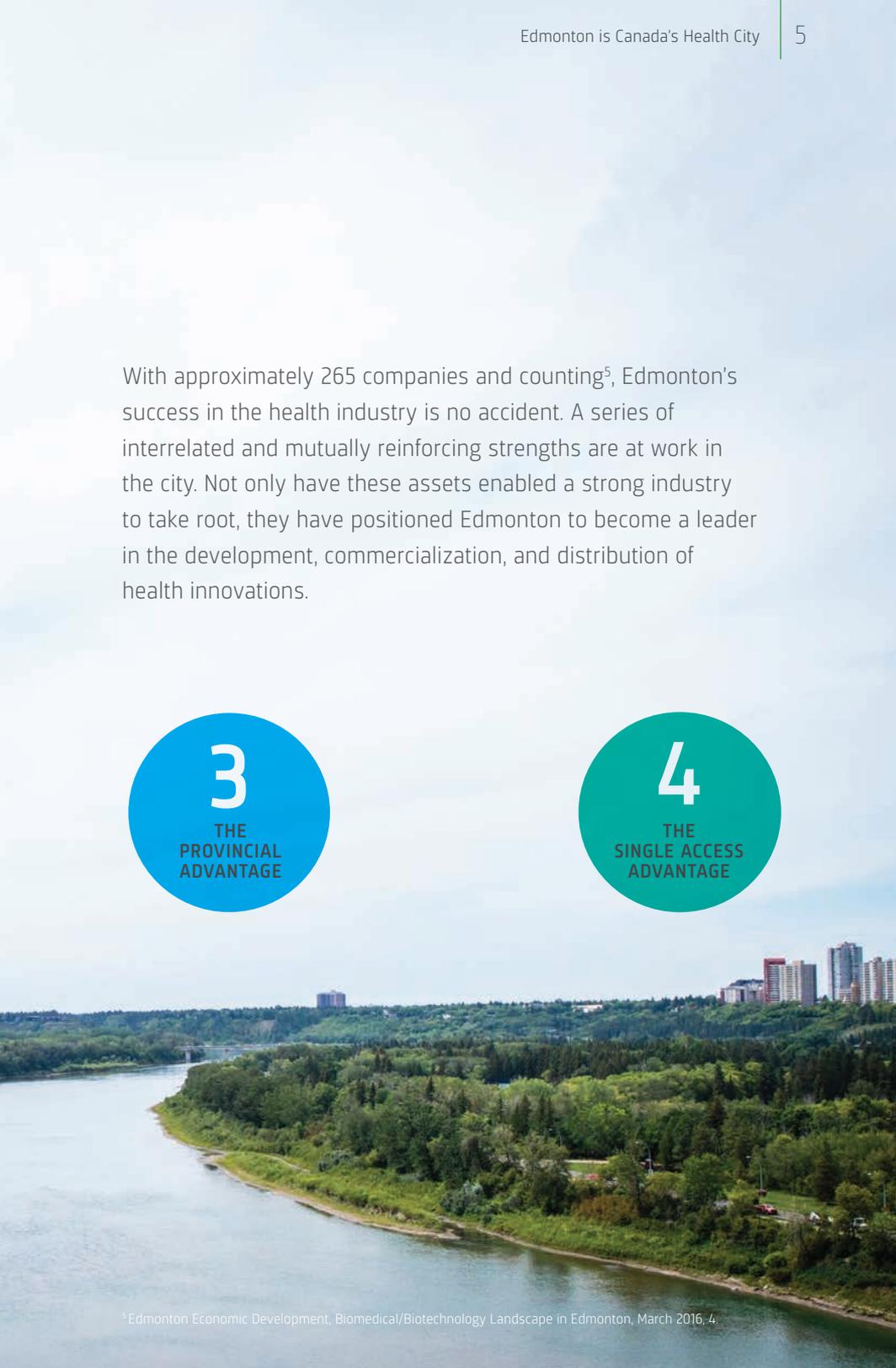
THE
INTELLECTUAL
ADVANTAGE

2

THE
MUNICIPAL
ADVANTAGE



With approximately 265 companies and counting⁵, Edmonton's success in the health industry is no accident. A series of interrelated and mutually reinforcing strengths are at work in the city. Not only have these assets enabled a strong industry to take root, they have positioned Edmonton to become a leader in the development, commercialization, and distribution of health innovations.

An aerial photograph of a wide river flowing through a lush green landscape. In the background, a city skyline with several high-rise buildings is visible under a clear sky. The river is in the foreground, and the greenery covers the middle ground.

3

**THE
PROVINCIAL
ADVANTAGE**

4

**THE
SINGLE ACCESS
ADVANTAGE**

⁵Edmonton Economic Development, Biomedical/Biotechnology Landscape in Edmonton, March 2016, 4.

1

THE INTELLECTUAL ADVANTAGE

A successful health sector needs smart, skilled people who understand science, business, and domestic and international markets. Thanks to Edmonton's network of post-secondary institutions, Edmonton has access to these skilled workers. With one of the largest pools of highly skilled labour in the country, the province has the highest proportion of people employed in natural and applied sciences and related occupations in Canada (8.7 per cent compared to the Canadian average of 7.6 per cent).⁶



The University of Alberta is one of Canada's leading research universities, with particular strengths in cardiology, virology, oncology, neuroscience, and organ transplantation. Scientists based at the university have made a number of medical breakthroughs, including a new heart transplant protocol for children, the world's first oral anti-viral treatment for Hepatitis B, and a revolutionary treatment for Type 1 diabetes known internationally as the Edmonton Protocol.

In addition to being a medical research powerhouse, the University of Alberta boasts expertise in a number of related fields, including information technology, machine learning, genomics, metabolomics, micro- and nano-science, and engineering. It's the site of the National Institute for Nanotechnology (NINT). Through its state-of-the-art facilities, NINT is devoted to translating nanoscience ideas into practical applications. Some of the institute's breakthrough

achievements include the creation of single atom quantum dots and the world's first single molecule electrical circuit.



National Institute
for Nanotechnology

Each post-secondary institution contributes in some way to the health system, and plays an integral part to the realization of innovative care and product commercialization.

Edmonton is also one of Western Canada's foremost health care centres, with over 10 per cent of its employed labour force working in the industry.⁷ The city has several specialized hospitals and leading research institutes, including:

- **STOLLERY CHILDREN'S HOSPITAL:** A nationally recognized centre for specialized pediatric services, the hospital is the country's leader in organ transplantation, as well as Western Canada's referral centre for pediatric cardiac surgery. Through the Stollery Children's Hospital Foundation's Chair in Autism, the hospital is also conducting ground-breaking research into the complex neurodevelopmental disorder.
- **CROSS CANCER INSTITUTE:** The institute is the lead for Alberta's province-wide cancer prevention, research, and treatment program. It also houses a world-class tumour bank, which allows researchers to accelerate the discovery of lab-based research to patient care.
- **GLENROSE REHABILITATION HOSPITAL:** The facility is the largest freestanding tertiary rehabilitation hospital in Canada. Recognizing the importance of new medical technologies, the Glenrose has declared "Advancing Function through Assistive Technology" as one of its four main research focuses.
- **THE MAZANKOWSKI ALBERTA HEART INSTITUTE:** With its state-of-the-art diagnostic and treatment technology and leading-edge research, the institute is a Canadian leader in the prevention and treatment of heart disease.

⁶ Ibid.

⁷ EEDC, Biomedical/Biotechnology Landscape, 6.



THE MUNICIPAL ADVANTAGE

Edmonton has some of the lowest costs of business in Canada, and boasts some of Canada's most innovative and energetic economic development organizations and incubation programs, including:

EDMONTON ECONOMIC DEVELOPMENT CORPORATION (EEDC): A not-for-profit company established by the City of Edmonton, EEDC is responsible for driving the economic growth strategy for Edmonton and the Capital Region, including supporting industry growth and diversification, encouraging entrepreneurship and innovation, and marketing efforts designed to bring business to the region. EEDC also operates the Edmonton Research Park, the city's largest centre dedicated to advanced research in medicine, biotechnology, software, clean energy, and nanotechnology.

STARTUP EDMONTON: Founded in 2009, Startup Edmonton is a campus and community hub where entrepreneurs, creators, investors and mentors can interact and inspire one another. Situated in downtown Edmonton, the facility contains workspaces and workshops that assist entrepreneurs in starting their businesses and receiving the tools necessary for success.



TEC EDMONTON: A joint venture between the University of Alberta and EEDC,



TEC Edmonton

TEC was ranked 4th in North America and 16th Globally as a University Business Incubator, and was established to support the city's emerging technology-based companies.

Its dual mandate of working with both private sector and university-based innovators to commercialize inventions is unique in Canada. It offers customized advisory services including market research, business planning and financing, as well as intellectual property assessments and protection, and training and mentoring for new entrepreneurs. In 2014, it launched TEC Health Accelerator to support health-related start-up companies, and have assisted in over \$4M in grant funding. To date, the initiative has helped to accelerate the growth of 200 health companies across the province, and works to continually establish relationships with multi-national corporations.

3

THE PROVINCIAL ADVANTAGE

Since the creation the Alberta Heritage Foundation for Medical Research (AHFMR) in 1980, the Government of Alberta has been at the forefront of supporting health innovation. The province's support network for research and development (R&D) has grown to include:



ALBERTA INNOVATES TECHNOLOGY FUTURES (AITF): The successor to Alberta Ingenuity, iCORE, nanoAlberta, and the Alberta Research Council, AITF works to bridge the gap between research and commercialization by offering technical R&D support, advisory services and talent development programs.

Part of the Alberta Innovates family, AITF focuses on assisting the development of technologies related to Alberta's agriculture, food, and forest sectors, as well as prion and prion-like neurological diseases.

ALBERTA INNOVATES BIO SOLUTIONS (AIBS): Formerly the Alberta Heritage Foundation for Medical Research, AIBS helps to drive innovation by funding health-related research in the province. It continues to fund legacy programs established through AHFMR, and has also initiated several funding programs of its own, including the Collaborative Research and Innovation Opportunities grant.

ALBERTA INNOVATES HEALTH SOLUTIONS (AIHS): Formerly the Alberta Heritage Foundation for Medical Research, AIHS helps to drive innovation by funding health-related research in the province. It continues to fund legacy programs established through AHFMR, and has also initiated several funding programs of its own, including the Collaborative Research and Innovation Opportunities grant.

GENOME ALBERTA: A partnership between Genome Canada, Industry Canada and the Government of Alberta, Genome Alberta initiates, funds, and manages genomics research and partnerships and strives to be the leading source of information and administration for proteomics, bioinformatics and bioethics research in Alberta.

NORTHERN ALBERTA CLINICAL TRIALS AND RESEARCH CENTRE (NACTRC): A joint venture between Alberta Health Services and the University of Alberta, NACTRC helps to facilitate research and clinical trials for pharmaceutical and research-intensive companies.

ALBERTA CENTRE FOR ADVANCED MNT PRODUCTS (ACAMP): A non-profit organization, ACAMP helps inventors develop, package, stress test, and manufacture circuit- and microfluidics-based technology. Notable medical devices developed in conjunction with ACAMP include the first fully featured portable Nuclear Magnetic Resonance spectrometer and an ultrasonic technology that enables the regeneration of dental tissue.

ALBERTA SCIENTIFIC RESEARCH AND EXPERIMENTAL DEVELOPMENT (SR&ED)

TAX CREDIT: An initiative of the Government of Alberta, this refundable tax credit is available to qualified organizations that invest in R&D in the province. It's refundable at the rate of 10 per cent on up to \$4 million in eligible expenditures for a maximum credit of \$400,000.



THE SINGLE ACCESS ADVANTAGE

Alberta Health Services (AHS) is Canada's first and largest province-wide, fully integrated health system. It's responsible for delivering health services to over four million Albertans through its 650 facilities, including 106 acute care hospitals.



**Alberta Health
Services**

AHS has 13 Strategic Clinical Networks (SCNs) designed to bring together clinicians, researchers, and innovators in such areas as cardiovascular health and stroke, addiction and mental health, and diabetes, obesity, and nutrition. In 2013, AHS partnered with AIHS to create the Alberta Partnership for Research and Innovation in the Health System, a program devoted to building networks of clinicians and researchers within the SCNs to augment the province's applied health research capacity.

AHS's size, scope, and centralization provides a unique opportunity to the health industry, particularly when it comes to data. The health authority collects and administers an immense amount of clinical and corporate data and information, which is used to examine disease clusters, practice

variations and health outcomes. Covering the entire continuum of care, AHS's comprehensive data is an invaluable asset for health researchers. To better support innovation, AHS is working on providing "easy, timely, secure, and appropriate" access to its data through such initiatives as the Provincial Health Analytics Network.⁸

In its recent *Strategy for Clinical Health Research, Innovation, and Analytics*, AHS also committed to accelerating the process of assessing emerging technologies. This presents a significant opportunity for health research companies looking to introduce new medical products in Alberta.

⁸ Alberta Health Services, *AHS Strategy for Clinical Health Research, Innovation, and Analytics* 2015-2020, 13.

WE NEED TO BE
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THE CHALLENGES

Edmonton may be home to a dynamic health sector, but like every other player in the global industry, the city is facing aggressive competition from both established and emerging jurisdictions. In this environment, “great” simply isn't good enough: we need to be excellent, and this means addressing the challenges that are preventing our health industry from realizing its true potential.

- 1. OVERRELIANCE ON GOVERNMENT FUNDING:** Perhaps the greatest challenge facing Edmonton health companies is the scarcity of private sector funding, particularly venture capital. Although Alberta-based companies raised a record amount of capital in 2014, it was still disproportionately lower than elsewhere in Canada and the United States.⁹
- 2. LACK OF ACCESS TO SPECIALIZED BUSINESS RESOURCES:** While Edmonton has a distinct advantage in terms of medical and research capacity, companies still have difficulty recruiting business development and sales executives. Inadequate access to expert services such as regulatory support, intellectual property and patent expertise, and marketing and branding is also hindering the commercialization of health technologies among the city's companies.
- 3. HURDLES TO TECHNOLOGY ADOPTION IN THE HEALTH CARE SYSTEM:** It can take more than a decade for a new technology to be fully adopted within the health care system.¹⁰ The period between development and adoption needs to be shortened so that companies can get commercially viable products to market, and health care providers and patients alike can benefit from these innovations.

⁹Deloitte, 13.

¹⁰Alberta Health Services, 8.

EDMONTON WILL
DRIVE THE FUTURE
OF HEALTH INNOVATION
IN CANADA.

THE OPPORTUNITY

Capitalizing on our hard-won talent, research capacity, and innovative spirit, Edmonton will shape the future of health innovation in Canada, transforming lives and driving growth in the process.

Whether it's our world-renowned researchers and facilities, entrepreneurs with drive and vision, or strong community support, Edmonton has what it takes to shape the future of health in Canada. But, if we want to take the lead in this crowded field, we need to develop and execute a health innovation platform that builds on our strengths, addresses our vulnerabilities, and raises our international profile.

To do so, we will take action in five areas.

1. ESTABLISHING A LEADERSHIP VEHICLE: We will take a concerted, deliberate approach to capitalizing on our competitive advantages. Leadership and influence matter – we will develop a coalition supported by the City of Edmonton through Edmonton Economic Development Corporation to work with partner organizations, industry, and governments.

This leadership vehicle, led by co-chairs, will focus on the following strategic goals:

- Strategic direction to create and develop the ecosystem
- Create local pride in the health innovation industry, in order to increase participation by students, professors, & entrepreneurs
- Drive entrepreneurship & innovation in Edmonton, as well as access to capital, in a way that keeps companies in Edmonton for as long as possible
- Market Edmonton's health innovation assets to target markets
- Strengthen local collaboration with the health system

2. BRANDING EDMONTON AS A HEALTH CITY: Edmonton's success may speak for itself, but not everyone is listening. We will do a better job of advertising Edmonton as a premier location for entrepreneurs to create and grow a business, for international companies to operate, and for world-class researchers to work.

We will build our health industry brand by:

- Creating and implementing a branding strategy that showcases Edmonton's successes and promotes its centres of excellence in health
- Marketing to target areas for attraction of talent and events
- Local pride – to demonstrate this as a key sector for the city and highlight the companies roles
- Engaging city champions to tell our success stories to Canadian and international audiences alike

3. CREATING AN ECOSYSTEM THAT ATTRACTS, RETAINS, AND SUPPORTS TALENT:

Great minds are at the heart of a successful health industry. We need to continue to attract the research and business talent that is so crucial to our industry's success. By investing in infrastructure and shared information systems, and providing greater access to capital, we will continue to recruit, retain, and support the best and brightest from across the country and around the world.

We will further enhance the health ecosystem by:

- Helping local companies develop better relationships with key channel partners
- Increase access to local mentorship for Edmonton entrepreneurs, enabling rapid development and fast failure through this mentorship
- Supporting value-based procurement processes that ensure Albertans benefit from innovations developed in Edmonton
- Driving innovation and entrepreneurship that solves business problems in a way that keeps them here at home
- Integrating health innovation as a core element of Edmonton's suite of industries
- Focusing on increasing the flow of high quality talent and investment while keeping them in Edmonton

4. INCREASING ACCESS TO CAPITAL: We can't build a health industry without strengthening our investment climate. We must begin to cultivate a wider range of options encompassing both the public and private sector and improve the venture capital environment.

We will expand access to capital by:

- Creating a body to liaise between the private and public sectors
- Presenting opportunities to local investors and utilizing local investment as an anchor to drive global interest.
- Helping raise awareness among entrepreneurs about what funding sources are available

5. ACCELERATING COMMERCIALIZATION: As we have already recognized with the creation of the TEC Health Accelerator, it's time to get more of our innovations out of the lab and into the health care system. While great science is fundamental to success in health sciences, turning that science into technologies and products that transforms and saves lives is the goal. Through our efforts, we will see greater collaboration among industry, governments, and the research community.

We will accelerate commercialization by:

- Seeking increased support for successful endeavours such as the TEC Health Accelerator
- Encouraging post-secondary institutions to assess health researchers on their commercialization and innovation efforts
- Removing additional barriers that prevent university researchers from pursuing commercialization, including institutional barriers
- Better connecting the respective research and technological capabilities of our city's post-secondary Institutions
- Developing undergraduate entrepreneurship and innovation opportunities

OUR RESEARCH
AND COMMERCIAL
SUCCESSSES ARE
REMARKABLE. AND
THE POTENTIAL
FOR OUR FUTURE IS
TREMENDOUS.

Together, these five action items will help us build Canada's Health City.

The strength of Edmonton's health industry is undeniable. Our research and commercial successes are remarkable, and the potential for our future is tremendous. Our city has created a versatile health environment that can support multinationals with established products and entrepreneurs looking to launch new ideas. We have what it takes; we just need to take the next step.

By focusing on developing our health economy, Edmonton's future can start today. We can create a globally leading health industry that generates growth and prosperity while transforming lives for the better.

We can attract and retain the most innovative minds, build our R&D capacity, and promote intellectual property development. We can diversify our economy, create more and better jobs, and generate greater opportunities and prosperity. We can grow our health management expertise, enhance the quality of our health care system, and improve health outcomes at home and abroad.

But we can't do this without acting first. The long-term success of our health industry depends on industry, academia, community champions, and governments working together to build Canada's Health City. So what are we waiting for? Our future awaits.

Our future awaits.
health@edmonton.com

