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Together we make a difference

Time for Canada to reclaim its place as a leader in scientific discovery

By David Hill

In October the Nobel Prizes for 2017 were announced, recognizing incredible advances in science that will impact all our lives for the better. If you were looking for Canadian scientists amongst the teams, you would be disappointed.

According to a federal government report commissioned by the minister of science titled Investing in Canada's Future – Strengthening the Foundations of Canadian Research and released in April, Canada's momentum in the sciences has never been worse.

Our country's investment in key emerging areas such as artificial intelligence, clean technology, nanotechnology, immunotherapy, bioinformatics or bio-engineering is flat-lined or declining, and falling seriously behind competitor nations.

We are not talking about matching the United States or Germany. Canada invests less in science research and development relative to gross domestic product than does Taiwan or Singapore.

WHY SHOULD WE CARE?

Because smart science delivers technologies we take for granted every day, such as Siri on our iPhones, minimally invasive surgery and secure online banking.

Science also creates companies, delivers high-paying and rewarding jobs, and is the backbone of the economy.

In London, Ont., jobs that depend on advancing science include those at Lawson Health Research Institute, the research institute of London Health Sciences Centre and St. Joseph's Health Care London and where I work; academic institutions such as Western University and Fanshawe College; and local businesses generating health devices, computer software and engineered products. A lack of investment in science could be devastating to our city.

This report places the failure to invest in science at the door of successive federal governments during the past decade.

Of course, it is not only government that should invest in science. It is industry that takes proven scientific findings and translates them into products we all consume.

But these innovative products need to start somewhere, most often in the laboratory. Fostering high risk, fundamental discovery science should be a core responsibility of government in a knowledge-driven economy.

In Canada, the contribution of federal funds to discovery science is now below 25 per cent of total research investment, and lower than most of our competitor nations. Consequently, research funds are scarce, laboratories are closing, fewer students are receiving advanced training, and fewer new businesses are emerging.

IT IS NOT TOO LATE.

The report provides evidence to show that Canadian scientists are still respected leaders in their fields. The engine simply needs fuel.

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UPCOMING DEADLINES

DECEMBER 2017 ISSUE

EDITORIAL: November 10
ADVERTISING:
Display – November 24 | November 28

Monthly Focus:
Year In Review/Future Of Healthcare/ Accreditation/: Overview of advancements and trends in healthcare in 2017 and a look ahead at trends and advancements in health care for 2018. An examination of how hospitals are improving the quality of services through accreditation.

JANUARY 2018 ISSUE

EDITORIAL: December 6
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Hospital News is published for hospital health-care professionals, patients, visitors and students. It is available free of charge from distribution racks in hospitals in Ontario. Bulk subscriptions are available for hospitals outside Ontario.

The statements, opinions and viewpoints made or expressed by the writers do not necessarily represent the opinions and views of Hospital News, or the publishers.

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Changes of address, notices, subscriptions orders and undeliverable address notifications. Subscription rate in Canada for single copies is $29.40 per year. Send enquiries to: subscriptions@hospitalnews.com

Canadian Publications mail sales product agreement number 42578518.

PRINTED IN CANADA

November 2017 Edition

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Scientific discovery

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To return Canada's discovery science enterprise back to 2006 productivity levels, we require an additional investment of $1.3 billion during four years, representing 0.1 per cent of the entire federal budget for each of those years.

The investment quickly pays for itself. Every $1 invested in fundamental research has been calculated to return $2.20 to $2.50 in direct and indirect economic activity.

Next year's federal budget is being put together right now in Ottawa, and we have an opportunity to reclaim our past reputation as a discovery nation; a nation that brought the world insulin, the Canadarm, Pablum, canola and the electron microscope.

The journey toward that next Canadian Nobel Prize needs to start now.

David Hill is the Scientific Director, Lawson Health Research Institute.

New website for patients and caregivers

The Federation of Health Regulatory Colleges of Ontario (FHRCO), which represents the 26 regulated health colleges of Ontario, has created a new website for patients at www.ontariohealthregulators.ca. The website is a one-stop gateway to the websites of all 26 health regulators in Ontario. From the website, patients can find the most trustworthy, relevant, and up-to-date information about Ontario's regulated health professionals.

Together, Ontario Health Regulators oversee more than 300,000 healthcare professionals working in various settings across Ontario. Their duty is to protect the public, making sure healthcare professionals are safe, ethical, and competent by:

- Setting the requirements for becoming a regulated health professional in Ontario. Only qualified health professionals are registered to practise.
- Setting and enforcing standards and guidelines so that you and your family can receive safe, ethical, and competent healthcare.
- Developing quality assurance programs so that registered health professionals keep their knowledge and skills up-to-date.
- Acting when you have a concern or complaint about your healthcare professional.

Patients and caregivers can be confident that only members of the colleges – regulated, highly-trained health professionals – may use protected titles such as pharmacist, nurse, physician, massage therapist, and dietitian. Only these and other regulated healthcare professionals are accountable to a regulatory body for the quality of care they provide.

The OHR website provides easy-to-access information and resources for patients about regulated health professionals in a single place in 10 different languages. Visitors can access the registers of all 26 colleges, and get important information about a health professional's registration and discipline history. The site contains helpful tips for patients to make the most of their care and time with regulated health professionals. Visit www.ontariohealthregulators.ca

Financial incentives for physicians not effective in increasing follow-up after hospital discharge

A financial incentive for physicians to see patients sooner after discharge from hospital had no sizable impact on 14-day physician follow-up rates, according to a new study by researchers at the Institute for Clinical Evaluative Sciences (ICES). Patients who have been discharged home following a hospital stay are vulnerable; 10 to 20 per cent will return to hospital within 30 days as a result of worsening symptoms, complications from treatment, or new medical problems. Early follow-up with a physician may be one way to help patients during this high-risk period.

"Financial incentives to improve follow-up after hospital discharge have been introduced in the United States and Canada, but their effect was unknown. What we found was that physicians with the highest uptake of the incentive had the highest follow-up rates at baseline, and they did not increase their follow-up rates after the incentive code was introduced," says Dr. Lauren Lapointe-Shaw, a doctoral student at ICES and an internal medicine physician.

LACK OF IMMEDIACY IN INCENTIVE PAYMENTS AND BARRIERS OUTSIDE A PHYSICIAN'S CONTROL MAY EXPLAIN WHY THIS POLICY INITIATIVE HAS NOT IMPROVED FOLLOW-UP RATES

A fee code introduced to Ontario in 2006 incentivised early physician follow-up after discharge. To understand whether it improved early physician follow-up rates, researchers from ICES, the University of Toronto and Mount Sinai Hospital, part of Sinai Health System looked at data on more than eight million patients discharged home from hospital in Ontario between 2002 and 2015. The study authors excluded newborns and pregnant women delivering in hospital, palliative care patients, psychiatric patients and those in hospital for more than 100 days.

This code was claimed by 51 per cent of eligible physicians and cost about $2.1 million annually.

"We found that despite uptake of the incentive by physicians, this financial incentive did not change rates of early follow-up after hospital discharge," says Dr. Lapointe-Shaw. "Physicians with the highest uptake of the incentive had the highest 14-day follow-up rates before and after the intervention, which suggests the incentive rewarded the highest performing providers without modifying their behaviour."

Lack of immediacy in incentive payments and barriers outside a physician's control may explain why this policy initiative has not improved follow-up rates.

However, the researchers do add that 66 per cent of patients did have a follow-up visit with a physician within 14 days after discharge.

"Effectiveness of a financial incentive to physicians for timely follow-up after hospital discharge: a population-based time series analysis," was published in *CMAJ*.

Healthcare organizations raised over $11 billion in FY 2016

Donations to nonprofit hospitals and healthcare systems in the U.S. and Canada increased by $63 million during the 2016 fiscal year, totaling $11.675 billion, the Association for Healthcare Philanthropy's (AHP) annual Report on Giving announced recently.

"We are excited to see health giving break the $11 billion mark for the first time," says Steven W. Churchill, MNA, president and chief executive officer of AHP. "The recovery in the Canadian healthcare development environment from a two-year downturn was also positive news for fundraisers."

AHP's annual survey of gifts, pledges and grants shows that total funds increased for the first time in Canada since 2013, by 10 per cent to $1.532 billion, the highest amount AHP has reported for Canadian healthcare fundraising organizations since it started the Report on Giving in 2004.

The median approximate return on investment (ROI) for Canadian organizations dropped in FY 2016 to $4.07 from $4.20 in FY 2015.

"Throughout North America, healthcare organizations are diligently using funds to improve their institution's ability to serve their communities. A fourfold ROI demonstrates the high standards to which fundraisers hold themselves," says Jory Pritchard-Kerr, FAHP, AHP board chair and executive director at Collingwood General & Marine Hospital Foundation in Ontario.

The Association for Healthcare Philanthropy sponsors the annual Report on Giving, which can be pre-ordered at www.ahp.org, to provide key health care philanthropy benchmarks. AHP was established in 1967 and represents nearly 4,500 development professionals at 2,000+ nonprofit hospitals, medical centers, health systems and related facilities internationally.

Gizmos and Gadgets:
Hi-tech healthcare "game changers"

By Stacey Palangio

Few industries will feel greater impact from hi-tech innovation than healthcare. Mind-blowing hi-tech gadgets, once only imagined through fictional story telling, are now emerging in ways that are making a significant change in the healthcare landscape. Over the past decade we've seen a steady stream of medical innovations moving from research labs into hospitals, clinics and doctor's offices. Let's look at some of the hi-tech gizmos we may see as part of our next healthcare experience.

VIRTUAL VITALS: AUGMENTED REALITY FOR OPTIMAL PATIENT MONITORING

Virtual reality technology is approaching mainstream for gamers and entertainment goers but it's still an awe-inspiring experience for most. Innovators have grabbed hold of the technology and it is now being cleverly applied in industries such as manufacturing, design, communications, and most importantly healthcare.

Take for example the Vitialiti neckband and ear piece created by med-tech company, Cloud DX. The neckband and earpiece worn by a patient can automatically measure their vitals and diagnose conditions like TB and asthma. This gizmo used with HoloLens – augmented reality glasses, (a Microsoft innovation), enables doctors to engage with the digital information from the Vitaliti tool as it automatically appears in the doctor's field of view. Imagine! With this technology, a doctor can monitor an entire ward of patients by simply looking from bed to bed.

MEDICAL 3D PRINT TECHNOLOGY: MAKING THE IMPOSSIBLE... POSSIBLE

3D print technology is driving major innovations in areas such as engineering, manufacturing, art, and education and it has opened a whole new world of possibilities for the healthcare industry. The technology itself is a "game changing" innovation but the possible applications are limited only by our imagination.

Among other things, 3D printing enables the rapid and inexpensive production of medical equipment, implants, prosthetic limbs, and plastic anatomical models. For example, when preparing for an operation, surgeons can print plastic anatomical models of the patient to help them perform more accurate surgery. Also, with a 3D printer, remote healthcare providers can access items that may be difficult or expensive to obtain by traditional means.

Bioprinting (3D printing of human tissues and organs) is the new frontier but what it could potentially do for the healthcare industry is limitless. Today, experts in tissue engineering and regenerative medicine worldwide are working to reproduce almost every human tissue so that in the future we can replace affected organs. Industry experts suggest that within a decade we will be able to print solid organs such as liver, heart, and kidney. Hundreds of thousands of people worldwide are waiting for an organ donor; imagine how such a technology could transform their lives!

Innovators see a major impact on the pharmaceutical industry as well. Imagine a future where 3D printers can assemble chemical compounds at the molecular level – which means they can print drugs. Patients would go to an online drugstore with their digital prescription, buy the blueprint and the chemical ink needed, and then print the drug at home. It looks like 3D printers will soon be an integral piece of equipment for every home!

HEALTHCARE ON-DEMAND – ANYTIME, ANY PLACE

Imagine having a digitally connected mini examination room at your fingertips 24/7? Now you can. Another Canadian innovation, the Connected Health System, developed by Cloud DX, is now being used in doctor's offices, clinics and in the home.

This "out of the box" health system contains easy-to-use monitoring devices so you can connect and undergo an online consult right from your living room in real-time. To track your vitals, the tool kit contains a wrist cuff device, a Bluetooth bodyweight scale and a pulse oximeter, glucose meter, speaker dock, and an android tablet. The system's software applications enable two-way communication between patient and care teams and provides audible schedule and medication reminders and referral and appointment options.

Continued on page 9

New tool helps target brain tumours with pinpoint precision

By Monica Matys

Life took a turn for Andrew Stewart five years ago. First, a diagnosis of skin cancer. Then the cancer spread to three tumours in his brain.

"Just smaller than a grape, you know. And I think that's quite large," Andrew says of the tumours in his brain. "So my next worry was, if they are growing, are they going to press against to start giving me headaches?"

Andrew was referred to Sunnybrook, the first hospital in Canada to offer radiosurgery through a technology called the Gamma Knife Icon.

The Gamma Knife delivers focused radiation to tumours that have spread (metastasized) to a patient's brain. The frameless Gamma Knife Icon means the patient doesn't have to have a frame screwed into their head to keep them still while the radiation beams carefully target their brain tumours.

Patients lie on the device's table, and are fitted with a customized mask to keep their head still during treatment. The customized Icon image-guidance system then allows for precise doses of radiation to be delivered to multiple tumours in the brain simultaneously.

This is a huge advance to delivering radiation, as opposed to whole brain radiation of the past, which can cause side effects like memory loss and fatigue. It also means patients skip the discomfort of having their head secured with screws in an invasive frame during treatment.

"For a long time, patients with brain tumours and metastases were largely considered at the end of life, and using the fanciest equipment known to man was thought to be unjustified," says Dr. Arjun Sahgal, radiation oncologist and head of Sunnybrook's Cancer Ablation Therapy program. "But as patients live longer, the focus is to make them live better, and using focused radiation can improve the ability for patients to maintain their memory and quality of life. We owe it to our patients to make their end of life as comfortable and as meaningful as we can, and to offer more patients radiosurgery that would have otherwise not have had access, and that's why technology like the Gamma Knife Icon is so important."

And for some patients, it can happen in less than one hour.

"My team and our patients used to stay late into the night in order to do treatments, and we were limited as to how many tumours we could treat due to technical difficulties and the time it took," says Dr. Sahgal. "Now, we are able to treat patients with multiple metastases – five, 10 or even 15 or more – with the Icon, and because it's frameless we can break up the treatment into a few lesions a day instead of patients laying in the machine for four to six hours."

Andrew says so far, he has had no side effects of radiosurgery, and was back to living a quality life right away.

Sunnybrook is now teaching other centres how to best use the Gamma Knife Icon, leading a North American Icon Research Group, and conducting research to push the potential of this technology even further ahead. H

Customized image guidance on the Gamma Knife Icon allows Sunnybrook's radiation team to deliver extremely precise targeted treatment to brain tumours.

Monica Matys works in communications at Sunnybrook Health Sciences Centre.

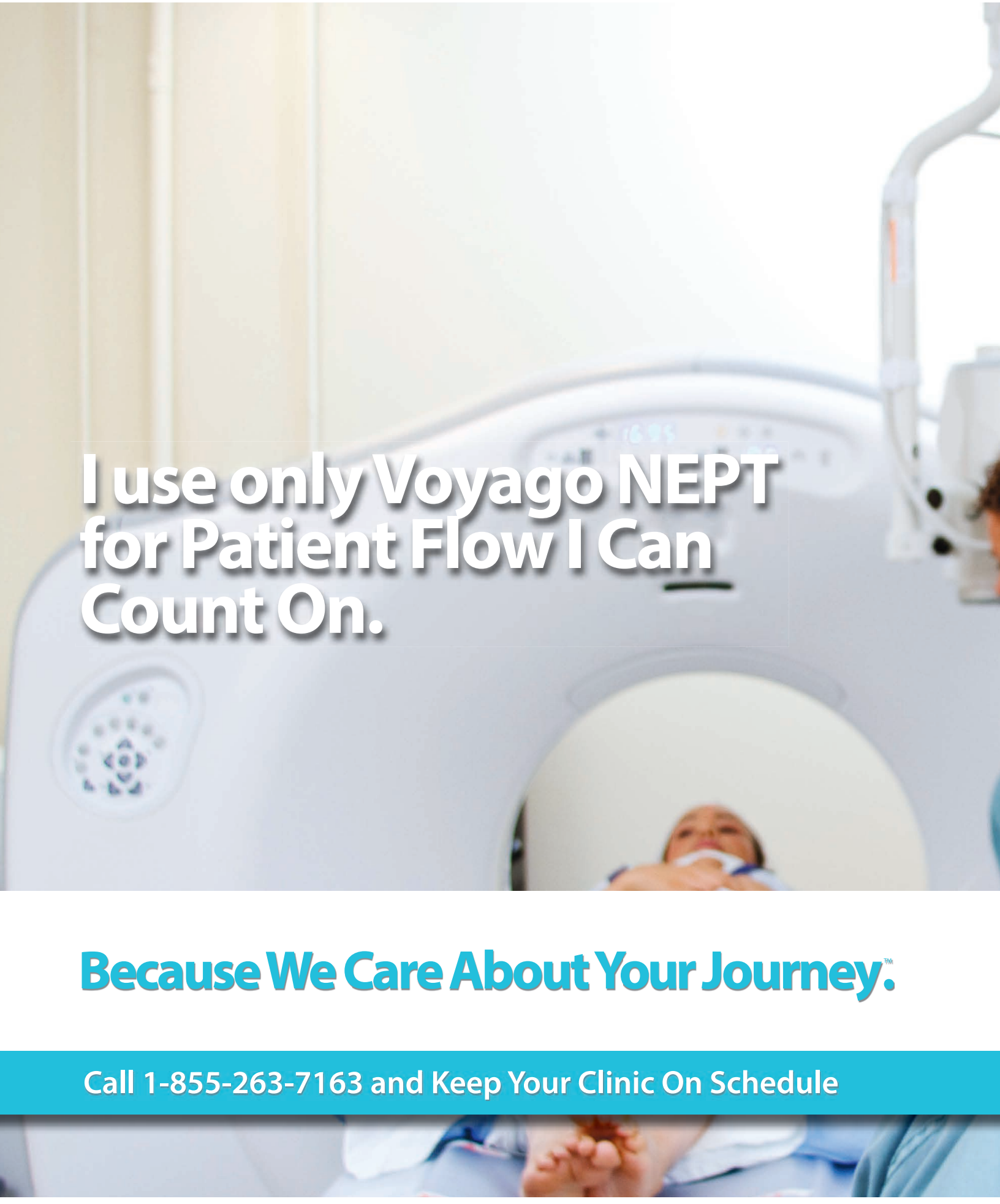
Game changers

Continued from page 8

The beauty of this system is that it enables remote patient monitoring by physicians – a benefit for both parties. By keeping tabs on patients this way the care team can intervene early to change behavior, adjust medications or send a home-care nurse to make a house call. The goal is to keep patients out of emergency rooms and hospital beds and feel more in control of their health.

We are only scratching the surface here, there is no question innovation is disrupting healthcare delivery and the journey will continue to be an exciting one. H

Stacey Palangio is a freelance writer.



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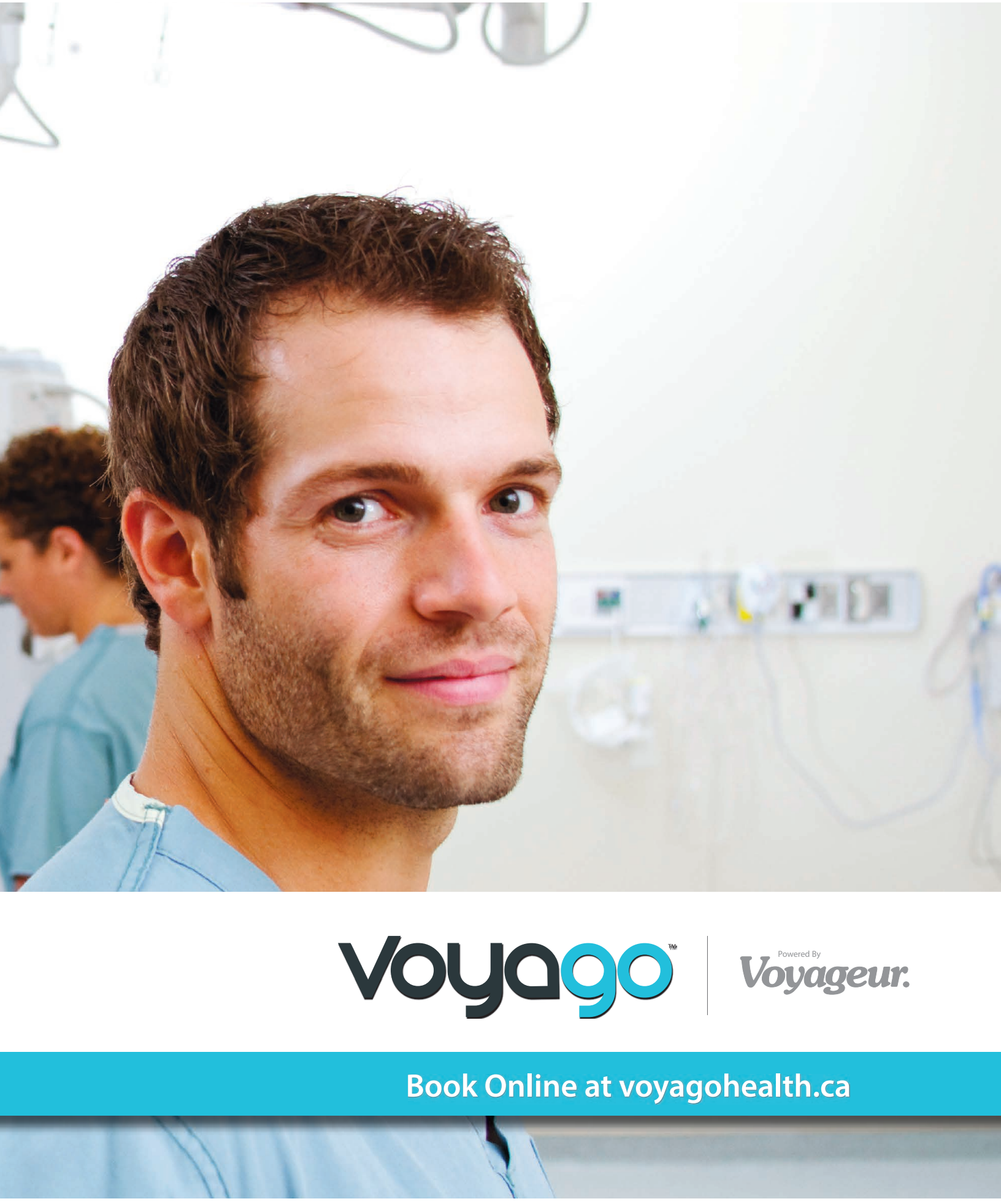

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Building Canada's medical technology industry one life-changing device at a time

By Katherine Nazimek

It was 1949, and in the basement of Toronto's Banting Institute, cardiac surgeons Drs. Wilfred Bigelow and John Callaghan were testing whether drastically cooling the body of a dog would make it possible to perform open-heart surgery. But during the procedure, the dog's heart unexpectedly stopped.

Desperate to revive the animal, Dr. Bigelow "gave the left ventricle a good poke" with his forceps, he says in his autobiography *Cold Hearts: The Story of Hypothermia and the Pacemaker in Heart Surgery.* The heart responded but then returned to a standstill. So, he "poked it regularly every second."

The action that he says "resembled a normal beating heart," jolted the heart back to life but also sparked an idea: perhaps electrical pulses can have the same impact as his manual poke.

With help from the National Research Council in Ottawa, the surgeons recruited Winnipeg-born engineer John "Jack" Hopps to create a machine that would make their idea a reality.

The electrical stimulator – known as a pacemaker – resembled an old-time mantel radio with dials to control the heart rate and voltage, and catheters that fed electrodes through the arteries to the heart.

Now much smaller and implantable, pacemakers have since saved millions of lives, including that of the man who invented it.

THE CURRENT REALITY

Medical technology (medtech) plays an important role in modern healthcare.

Patients are benefitting from more targeted, less invasive treatments with shorter recovery times. Hospitals see better treatment outcomes, shortened length of stay, and reduced costs that inevitably could contribute to sustaining our health system.

But Canada is lagging. In 2016, Canada's medical technology market sat at an estimated US$6.7-billion in a US$336-billion global market.

"Canada is home to world leaders on the scientific front, physicians who do high procedural volumes and complex cases, and strong clinical research capabilities," says Dr. Brian Courtney, an interventional cardiologist at Sunnybrook Health Sciences Centre who earned his engineering degree before attending medical school. "And yet, when we go and use devices, they're often sourced from elsewhere, not Canada."

Jack Hopps was in no rush to patent the idea of the pacemaker and it became one in a list of successful inventions – like the lightbulb and the zipper – that was invented by Canadians but commercialized elsewhere. This means that the rights and associated profits went elsewhere too.

Canada imported $8.6-billion in medical devices in 2016 and exported only $3.1-billion, according to Statistics Canada – a trade gap of $5.5-billion. And with an aging population and increased health awareness, the world market is projected to grow.

While many Canadians have the ability to innovate, industry leaders say few have the skills necessary to take a medical device from idea to invention through commercialization. As a result, and more heartbreaking than its impact on our economy, many promising medical technologies may never reach the patient bedside.

FILLING THE GAP

The Schulich Heart Program at Sunnybrook Health Sciences Centre has taken the lead to address this skills gap and nurture a generation of medtech professionals by launching a hospital-based education program called Medventions.

The Medventions' mandate is twofold: pave the way for new waves of medical technology that are directly targeted at unmet clinical needs; and mentor scientists, clinicians, and engineers in the complexities of bringing their innovations from bench to bedside.

Over a four-month fellowship program, a small group of clinicians, engineers and business graduates undergoes entrepreneurial training while being immersed in a clinical setting.

Just like the pacemaker, many ideas emerge from challenges seen on the frontline. Medventions team members – side-by-side with healthcare professionals – see with their own eyes the daily challenges that are faced.

Similarly, healthcare professionals who are working with fresh sets of eyes and being armed with new knowledge of the commercialization process, begin looking at their challenges as ones that can be fixed.

When the program first launched last fall, the inaugural group of engineers, scientists and clinicians came together to solve a common problem faced by cardiologists worldwide: how to better image and fix blocked blood vessels.

The team worked with academic and industry advisors to devise a solution, build a prototype, and plan the steps necessary to commercialize a product – from protecting intellectual property to manufacturing.

Katherine Nazimek is a Communications Advisor at Sunnybrook Health Sciences Centre.

The Medventions program at Sunnybrook fully immerses students with health-care professionals in real-world clinical settings to develop innovative medical technology that directly targets unmet clinical needs.

Photo credit: Sunnybrook Health Sciences Centre

They are now in the process of obtaining a patent for a device that could potentially improve patient outcomes and also save hospitals money.

"The idea is just the beginning," explains Graham Wright, research director of the Schulich Heart Research Program. "Bringing a device to market is a lengthy process that involves building prototypes, protecting intellectual property, acquiring financing, manufacturing, obtaining regulatory approvals, and performing studies before reaching the bedside."

It's a process that can take upwards of 10 years. But the Medventions program provides innovators with the tools they need to get started.

"Our hope is that participants can then apply their talent to drive innovation in organizations; lead research projects; or build their own start-ups," says Dr. Courtney, also the founder of Conavi Medical Inc. "And do this all with the mindset of improving patient care, and using our healthcare resources more effectively."

For more info about Medventions, visit sunnybrook.ca/medventions H

New software has respirologists breathing easy

By Kelly O'Brien

A respirology team is using new software to improve workflow and reduce errors in diagnostic reporting in the Pulmonary Function Lab.

The software, developed by Influx Workflow Solutions, extracts patient data from a range of diagnostic devices and consolidates multiple reports in a single reporting software. The report can then be viewed quickly and easily by respirologists and other caregivers.

Prior to installing the software, a number of factors disrupted the workflow, according to Dr. Marie Faughnan, a respirologist and director of the Pulmonary Function Lab at St. Michael's Hospital.

"In short, we did not have a very efficient setup," she says.

The Pulmonary Function Lab does a wide range of diagnostic tests and each machine produces a different report. With Influx, physicians and staff can access all of a patient's reports, instead of collecting separate reports from each machine.

"Tests include spirometry, lung volumes, lung diffusing capacity, airway resistance and exercise oximetry among others," says Eva Leek, a respiratory therapist. "Now, we can gather all reports from just one workspace and see a complete view of the patient's respiratory status."

St. Michael's is also a teaching hospital, so there are extra steps in the reporting process to accommodate training responsibilities.

"A report is generated by the Pulmonary Function Lab, goes to the resident and then on to the respirologist for review and a teaching-moment discussion," says Dr. Faughnan.

This made for a workflow that was slow and prone to error. While preliminary reports might be in clinical hands within a day, full diagnostic reports sent back to referring physicians could take a week or more to produce.

The team needed a system that was user-friendly, fast and made reports easy to interpret and integrate with the patient's electronic health record, explains Dr. Faughnan.

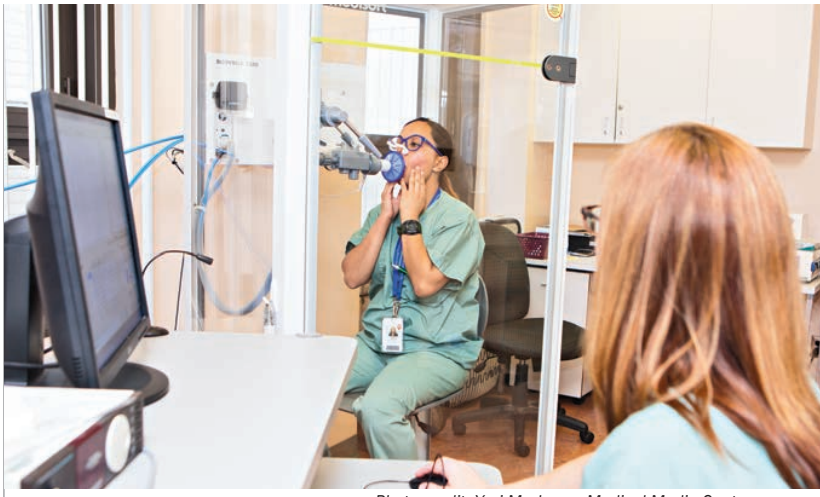

Photo credit: Yuri Markarov, Medical Media Centre

Dr. Marie Faughnan, director of the Pulmonary Function Lab, and Eva Leek, a respiratory therapist, led the team that brought Influx reporting software to the respirology unit.

The software was integrated with the hospital's existing cardiology PACS system for immediate physician reporting. The new system eliminates time-consuming steps in the reporting process, automates old paper-based systems and reduces the potential for errors.

Preliminary respiratory reports now are available in patients' electronic charts almost immediately after being written. Final reports are not far behind, often showing up the same day.

"It did take us longer than expected, but what got us through it was the effort all the people at the hospital put into this," says Leek. "We kept working together over the past year to get us where we are today." H

Kelly O'Brien works in communications at St. Michael's Hospital.

Collaboration drives health technology research

By Jane Langille

As the number of new healthcare technologies continues to grow, West Park Healthcare Centre in Toronto is pursuing a growing number of research projects that have the potential to improve patient care and quality of life.

"Research and innovation have always been important drivers to improve quality of care, but with the recent explosion of new medical technologies, we have many more opportunities to create innovative solutions," says Jan Walker, vice president of Strategy, Innovation and CIO at West Park. "In the past, manufacturers were more focused on selling solutions. Today, the relationship has shifted to more of a partnership model, where we work together to develop and test new ideas."

Here are three projects that highlight how West Park is collaborating with healthcare innovators to study new technologies.

NEXT-GENERATION MEDICATION DISPENSER

Medication adherence at home continues to be problematic, especially for older adults and people with cognitive impairment. To address this issue, West Park researchers are leading a Canada-wide study to evaluate the Karie home medication dispenser. Developed by AceAge Inc., the dispenser resembles a large mobile phone attached to a cassette loaded with multi-dose blister packs of medications. The unit schedules and then reminds patients to take their medication by chiming and lighting up, delivering the right dose at the right time.

The MVN BIOMECH suit mentioned in the story, being demonstrated by amp patient Jakob Kepka.

The research project, headed by Tiziana Bontempo, Adrienne Kurpis and Sam Bassili, will compare medication adherence among 300 patients randomly assigned to use Karie or standard delivery methods using blister packs and vials over six months. West Park researchers and healthcare staff who provide education to patients before discharge are collaborating with colleagues at Capital Care Inc. in Alberta. This project is funded by a research grant from the Centre for Aging and Brain Health Innovation (CABHI) under the 2017 Industry Innovation Partnership Program (I2P2).

A SMARTER HOSPITAL BED

West Park is working with other Ontario hospitals, to test the Ably hospital bed. Developed by Ably Medical AS of Norway, the intelligent bed incorporates machine learning to learn, mobilize and collaborate with patients at risk of falls and pressure ulcers.

West Park's role with this project, headed by Pam Madan-Sharma, Lynn Suter and Penney Deratnay, involves using an additional innovation, the MVN BIOMECH suit made by Xsens of the Netherlands, to evaluate the Ably bed for its ability to reduce musculoskeletal disorders among healthcare workers who lift and transfer patients. West Park nurses will wear kinematic suits embedded with tiny, 3D motion tracking sensors. Researchers will compare biometric changes in the nurses' centre of mass and support base when lifting and transferring patients with the Ably bed and with a standard hospital bed. This project is also funded by a CABHI 2017 Industry Innovation Partnership Program (I2P2) grant.

3D SCANNING THAT INCORPORATES A HUMAN TOUCH

3D printing is now commonplace, accessible to the public at community libraries. West Park is using 3D printing to make assistive devices tailored specifically to an individual to help people regain independence in daily life.

It's not as simple, though, to 3D print prosthetic devices. The hospital and its Prosthetics and Orthotics department headed by Winfried Heim, is working with industry partners to develop a scanning solution that incorporates the art of the prosthetist. Experts in their field, prosthetists feel and manipulate residual limbs to understand underlying bony and soft tissue areas that inform the development of custom-made devices for each patient. Standard 3D imaging misses those unique characteristics. By incorporating human expertise into 3D scanning, West Park hopes that in the future, it may be able to help people obtain high-quality, cost-effective prostheses on short turnaround time.

Jane Langille is a freelance writer.

Lynda

RESPIRATORY THERAPIST

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AI in healthcare: friend or foe?

Artificial intelligence is creeping into our daily lives from the workforce to cars to customer service. But are we ready for it when it comes to one of the things with the highest personal stakes: our health?

By: Adam Howatson

Would you trust a medical diagnosis generated from artificial intelligence (AI) technology? According to a recent survey of 2,000 Canadians conducted online by OpenText, nearly 34 per cent of respondents in Canada said they would if it was confirmed by a doctor.

When you think about it, this is just one step further from what many of us do already – probably to our doctor's dismay – self-diagnosing with the Internet. While using AI would be significantly more accurate than a search engine result that turns up a website that may or may not have the correct information, we are increasingly becoming more comfortable with technology in scenarios we could have never before imagined.

IN FACT, OVER HALF OF THE CANADIAN RESPONDENTS THAT PARTICIPATED IN THE SURVEY BELIEVE AI WILL HELP THEM GET A MORE ACCURATE (32.2 PER CENT) AND QUICKER (29.4 PER CENT) DIAGNOSIS.

AI is making its way into our daily lives from the workforce to cars to customer service. And Canada is fast becoming a key player in this space – with AI hubs in the Toronto-Waterloo corridor, Ottawa and now Edmonton. With access to the latest AI research at our fingertips, it's no surprise that many industries in Canada, including healthcare, will be direct beneficiaries.

With Canada's healthcare system already stretched to the max, AI-enhanced analytics could be deployed to sift through massive amounts of complex data, allowing doctors to make decisions and recommendations faster and more efficiently for low-risk repetitive jobs. In practice, this could benefit patients by cutting down wait times for things like triage, blood pressure readings or medical record look-ups.

STANDING UP FOR PATIENT RIGHTS

These benefits are in line with the ethos of Canada's healthcare system, which puts the patient at the centre of care. In fact, over half of the Canadian respondents that participated in the survey cited above believe AI will help them get a more accurate (32.2 per cent) and quicker (29.4 per cent) diagnosis.

That's why AI-enhanced analytics are best deployed in any process where the volume and variety of data is so great it would be impossible for any human to draw correlations and connections efficiently enough to be valuable. Healthcare is the perfect fit for AI, especially in hospital settings where the collection of this data could be streamlined, giving clinicians access to new insights around patient care.

Think about all of the structured and unstructured data that exists – clinicians' notes, recordings of patient interviews, test results, imaging, prescriptions – the list goes on. So, in effect, anything that relates to how patient information becomes part of this so-called, "data ecosystem." AI-enhanced analytics then leverages machine learning against these massive amounts of complex data to help doctors and clinicians find the necessary insights to make decisions and recommendations.

THE FINAL SAY

As evidenced by the results of the survey, Canadians have a very high level of trust for the decisions made by AI and, in certain instances, it means that we don't have to supervise. However, as the impact of the decisions becomes more and more critical, AI's role switches to augmentation. In these instances, it's not a matter of not trusting AI but instead relying on it to make some recommendations and options. Ultimately the final decision is still in the hands of the physician.

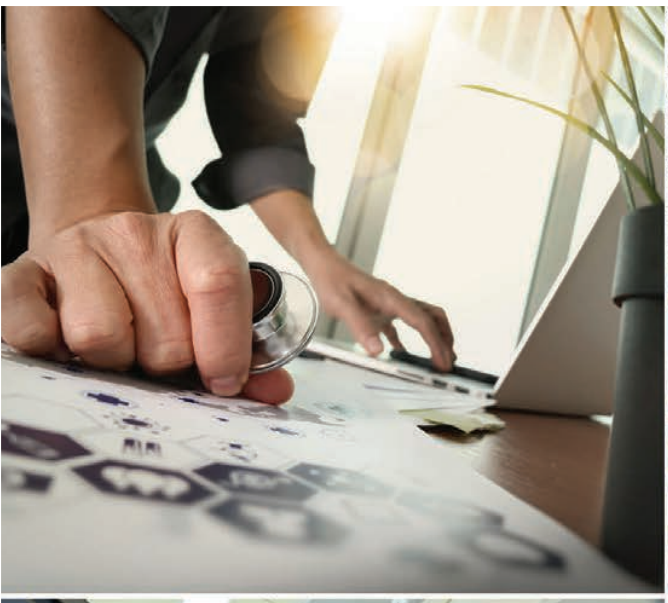
But this isn't a scenario that we should worry about any time soon as even though we have the technology to enable it, the solutions are yet to become available on the market.

The novelty here is not that the technology is new, it's what it's doing. This reality is turning what we once would have only thought of as magic into something that will benefit the healthcare ecosystem in the future. H

Adam Howatson is Chief Marketing Officer at OpenText.

MEDEC

CANADA'S MEDICAL TECHNOLOGY COMPANIES



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Fourth annual MEDEC supplement

Welcome to the fourth edition of the *Hospital News* medical technology supplement in partnership with MEDEC. We're pleased to once again have this opportunity to share some of the exciting initiatives taking place in collaboration between the medical technology (medtech) industry and our partners in healthcare and government.

Innovation is a popular term these days, but in the context of medtech, it's really about technologies improving health outcomes for patients, while contributing to the critically important goal of health system sustainability. Achieving positive change in healthcare can be a challenge, but as exemplified by a number of the stories we've shared, there is increasing recognition about the important role that medtech can play in creating better patient experiences, improving outcomes and enabling smarter, more efficient care.

In Ontario, this work is being led by William Charnetski, the province's Chief Health Innovation Strategist, along with his team at the Office of the Chief Health Innovation Strategist (OCHIS). Mr. Charnetski's role and the creation of his office (which is dedicated to improving the adoption of medtech innovation in Ontario and growing the industry) is unique and the first of its kind in Canada. His office is breaking down barriers for innovators and providing opportunities for health system partners to address the challenges they face through initiatives like Innovation Brokers and the $20M Health Technologies Fund. Additionally, the Ministry of Government and Consumer Services' recently released an Innovation Procurement Primer which provides a roadmap for healthcare providers to address their needs by working with innovators on developing technologies/solutions that don't already exist in the marketplace.

Brian Lewis, President and CEO of MEDEC.

Quebec's Life Sciences Strategy is a massive investment that includes a strong focus on medtech, including the creation of an Innovation Bureau, an $18M Health Innovation Fund and a commitment to adopt value-based procurement methodologies for innovative technologies. Shifting to value-based procurement is a very important element of this Strategy, as many technologies are currently procured based on lowest cost, as opposed to greatest total value to patients and the healthcare system. We're excited that this work is now underway with value-based procurement pilot projects currently being planned.

Alberta has developed a process through which they're seeking to pull technologies into the healthcare system that address the provinces healthcare challenges. This is being done through the province's Strategic Clinical Networks, which are, "teams composed of researchers, physicians, patients and managers work(ing) in specific areas of health with the goal of finding new and innovative ways of delivering care that will provide better quality, better outcomes and better value for every Albertan." We're pleased to highlight the first project underway involving a sepsis test that offers immense potential benefit for patients and Alberta's healthcare system.

These are just a small sampling of the many initiatives underway across Canada that are seeking to improve Canada's healthcare system through medtech innovation. So much progress is being made and our association and our members look forward to continuing this momentum with our healthcare partners in 2018. H

MEDEC is the national association representing the medical technology industry in Canada. MEDEC members are committed to providing safe and innovative medical technologies that enhance the quality of patient care, improve patient access to healthcare, and help enable the sustainability of our publicly-funded healthcare system.

Innovation brokers

Adopting innovative new technologies into our healthcare system can be a challenge. Issues such as change management, spreading the use of innovation and showcasing the value of technology to both patients and the healthcare system are all issues that are encountered by both medical technology innovators and health system leaders.

One way that Ontario is seeking to address these challenges is through Innovation Brokers. Announced earlier this year by Ontario Health Minister Dr. Eric Hoskins, the Brokers will accelerate the work of the Office of the Chief Health Innovation Strategist (OCHIS) by connecting health technology companies, healthcare providers, patients, and other key stakeholders to advance health technology innovations into practice.

"Our goal is to use the power of technology to deliver on the needs and goals of patients and the health system," says William Charnetski, Ontario's Chief Health Innovation Strategist. "The Brokers provide a necessary link between those who need to work together to accelerate the spread of effective health innovations so as to benefit patients, the healthcare system, and Ontario's economy."

The first three Innovation Brokers are: The Council of Academic Hospitals of Ontario (CAHO), Jennifer Zelmer of Azimuth Health Group and Martin Gurbin of Metamor Health Inc. Each bring their own knowledge, expertise and backgrounds to address the challenges facing the adoption of medical technology.

CAHO is the association representing Ontario's 23 research hospitals. Given the unique reach that is afforded to them in this role, CAHO has established a streamlined process to enable this work and broker connections between innovators and Ontario research hospitals to find real-life validation test sites for technologies.

"As an Innovation Broker, we provide the industry with streamlined and simultaneous access to Ontario's 23 research hospitals," says Rena Menaker, Director of Policy and Member Relations and Lead of CAHO's Innovation Broker Task Force. "By knocking on one door, innovators have faster access to validation test sites and, in time, faster adoption into some of the most advanced hospitals in the province."

SUBMISSION PATHWAY
CAHO staff screens innovations submitted for validation test sites

Innovations that meet screening criteria are sent to CAHO's Innovation Broker Task Force

Task Force members work with their hospitals to see if innovations are a good fit

Interested hospitals work with the company/innovator to develop processes for validation testing

HOW CAHO'S INNOVATION BROKER PROCESS WORKS

To provide innovators with market intelligence on the needs of CAHO hospitals and the health system, CAHO has published a list of critical problems requiring innovative solutions. Examples of the problems include:

Continued on page 20

Innovation brokers

Continued from page 19

- How to optimize hospital service utilization to reduce readmission rates and avoid admissions
- How to enable patients to take a more active role in their care
- How to improve discharge care and/or transitions to community and other care settings

While the problem statements do certainly provide insights into the challenges facing its member hospitals and allow industry to align to the needs of the hospitals, CAHO does note that proposed innovations do not necessarily need to be limited to the list of problem statements they've outlined and innovative solutions do not need to be limited to addressing a problem in its entirety; they can also address discrete components within the overall problem statement.

Once a technology innovator has examined the problem statements, if they determine that they offer a solution to the outlined needs (or have a solution that offers other significant benefits), they can submit a proposal to CAHO outlining their offering and its benefits to patients and the health system. Submissions are examined by the team at CAHO and if it meets the screening criteria, it is then sent to CAHO's Innovation Broker Task Force.

While still in its infancy (CAHO opened its doors as an Innovation Broker in June), CAHO's Innovation Broker work is receiving positive feedback from industry and from within CAHO-member hospitals, as it continues to remove barriers and streamline innovation uptake

"Many of our members have submitted technologies to CAHO in its role as an Innovation Broker and we're really excited about the opportunities it presents as an avenue to gain adoption of technology innovation," says Brian Lewis, President and CEO of MEDEC. "We can't wait to see the outcomes of the partnerships, particularly given the potential patient and health system benefits."

Beyond helping individual technologies gain adoption into healthcare system, CAHO hopes that this initiative will spur broader collaboration between industry and its hospitals to meet future needs.

"Through CAHO's Innovation Broker role, we are building capacity to effectively pull innovations into CAHO hospitals, while providing the industry with greater clarity and transparency on market needs, and on our processes and timelines," says Menaker. "While already adding value for innovators today, this work is also laying the foundations to help clear the path to market for innovators tomorrow. As a result, it is our hope that industry will have a greater opportunity to build innovation-focused partnerships with CAHO hospitals and accelerate validation and adoption of innovations that meet the needs of patients in the future."

LEARN MORE AND CONNECT WITH ONTARIO'S INNOVATION BROKERS

Jennifer Zelmer of Azimuth Health Group

Jennifer Zelmer and the team at Azimuth Health Group officially launched 3iOntario, a platform connecting health innovators and innovation champions with resources and opportunities to support innovation. For smaller organizations and start-ups, it can be hard to navigate Ontario's healthcare innovation ecosystem and find the information needed to succeed. 3iOntario is designed to address this gap. Each week, it will share a range of available funding and contract opportunities, as well as recently published information and thinking related to health innovation. Follow @3iOntario on Twitter and visit azimuthhealthgroup.ca/3iontario. Jennifer can also be reached at jennifer.zelmer@ontario.ca.

CAHO

Visit: http://caho-hospitals.com/partnerships/innovation-broker/ or email innovationbroker@caho-hospitals.com

Martin Gurbin, Founder, Metamor Health Inc.

Martin Gurbin has met with a broad range of health tech companies to provide mentoring, business assessment and strategic advice to help drive deals forward. Along with supporting companies, Martin is also building a network of community healthcare providers to serve as early receptors for new health technology. Martin can be reached at martin.gurbin@ontario.ca.

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Quebec's Life Sciences Strategy

A game changer for innovation and value-based procurement

Quebec's recently announced Life Sciences Strategy is exciting news for the medical technology sector. Central to its relevance is that innovation and value-based procurement are now recognized by both the Treasury Board Secretariat and the Ministry of Health as integral success factors.

"We have convinced the provincial government that value-based procurement is necessary," says Benoît Larose, Vice-président Québec, MEDEC. "For the medical technology sector, this is an important factor in the overall Life Sciences Strategy."

Quebec's Strategy has four key objectives: increased investment in research and innovation; fostering the creation of innovative companies; attracting new private investment; and the further integration of innovation into the health and social services network. This is a long-awaited, ambitious agenda that is quickly shifting into high gear.

Ministers Anglade and Barrette announcing Quebec's $205M Life Sciences Strategy. Photo courtesy of Ministry of Economy, Science and Innovation.

> **"WITHOUT DOUBT, THE QUEBEC GOVERNMENT IS SENDING A POSITIVE MESSAGE THAT IT WANTS TO DRIVE INNOVATION INTO ITS HEALTHCARE SUPPLY CHAIN."**

"It took some time for Quebec to come to this decision, but things are now moving very fast," says Larose. "There is lots of good news here for MEDEC members, including that medical technologies are to be treated with the same attention as other areas in life sciences."

Quebec has put significant resources behind the Strategy. The investment in research and innovation includes $75 million for the new Health Collaboration Acceleration Fund, and $11.1 million to improve clinical research processes. Support for innovative companies – from concept to commercialization – includes $100 million under the BioMed Propulsion program. As well, there is $26.5 million for a new health and social services Innovation Bureau.

"We've been asking for an Innovation Bureau, and are very happy to see that the Bureau will report directly to the Health Minister," says Frank Béraud, Chief Executive Officer of Montréal InVivo, the not-for-profit life sciences tech cluster in the greater Montréal area. "There is also a commitment to create a new fund dedicated to health technologies. I think that's great, because medtech companies were under the radar before that."

The Innovation Bureau will have access to a Health Innovation Fund of $18 million over five years, with the ability to request solutions. There will be an optimized evaluation process, including important measures to improve medical technology procurement.

"Eighteen million dollars may not sound like a lot of money, but I believe that the Bureau will play a very positive role," says Larose. "It will certainly increase the likelihood that we'll see tangible results."

MEDEC will be active in making certain that Quebec's new measures are easily accessible by the medical technology sector. MEDEC will also be keeping a close eye on how the new Life Sciences Strategy will affect the acquisition of innovative technologies, given the province's commitment to revisit public market policies and practices.

"For years, MEDEC has been requesting that Quebec's public procurement policies be more closely adapted to the reality of the healthcare system and industry," says Larose. "At present, Quebec's procurement policies and rules are government-wide, which results in generic regulation. Quebec has recognized this as a problem. The Strategy calls for a review, which industry will participate in."

With the new Strategy, Quebec's Ministry of Health will be mandated to look at health innovation, making sure that technologies are proven to contribute positively to the healthcare system in a broadly defined manner. This is completely new: before, even if a technology was efficient and effective, it often never saw widespread adoption.

"With the system we have today, the lowest bid wins the RFP," says Béraud from Montreal InVivo. "We know that kind of approach doesn't help introduce innovation into the system. Clearly, somewhere in the procurement process there has to be an understanding of value beyond the lowest cost."

Shortly after announcing the Life Sciences Strategy, Québec also came out with its Research and Innovation Strategy, a huge investment of $267.1 million, with another $100 earmarked for the development of the province's super-cluster in artificial intelligence. The measures include $585 million for additional initiatives by 2021-22.

"That Strategy also includes provisions for the commercialization of innovation," says Larose. "It means that there are now two big initiatives which are favorable to our sector, which is very encouraging."

Without doubt, the Quebec government is sending a positive message that it wants to drive innovation into its healthcare supply chain. Importantly, the Life Sciences strategy is the result of direct stakeholder input and consultation with the Minister of Health, Gaétan Barrette and Minister of Economy, Science and Innovation, Dominique Anglade. There is a strong belief among stakeholders that the high-level political buy-in, and the degree to which the Strategy reflects industry concerns presented during the consultation process, are indications of deep, long-term government commitment.

"It must be emphasized that this Strategy is important to us at MEDEC due to its concrete measures," says Larose. "As an association, MEDEC was looking for the Quebec government to address both procurement concerns and the poor integration of innovation in the healthcare sector – and that's what we're seeing. This is a very encouraging, tangible move forward." H

Interview with CAHO's Innovation Broker Task Force Co-Chair

CAHO's Innovation Broker task force is co-chaired by Ted Scott, Acting Vice President Research & Chief Innovation Officer at Hamilton Health Sciences. CAHO sat down with Ted to get his take on why the Innovation Broker work is important, and how it makes Ontario healthier, wealthier and smarter.

WHAT INSPIRED YOU TO BE INVOLVED WITH CAHO'S WORK AS AN INNOVATION BROKER?

In my role as Chief Innovation Officer at Hamilton Health Sciences (HHS), I am helping to create a culture of collaboration and working to connect our clinical experts and scientists to high potential digital health companies to develop innovative clinical care models. My work at HHS is really well aligned to the Innovation Broker mandate and I'm excited to help make it easier for companies to get their innovations into Ontario's research hospitals. At the end of the day, this will improve care and make our health system more efficient for our patients.

WHAT'S IN IT FOR INNOVATORS?

The CAHO Innovation Broker work provides new opportunities for companies and research hospitals to work together to develop solutions and drive innovation adoption across the province. It also provides companies with stronger and more meaningful feedback on their innovations, allowing them to iterate and develop more relevant and marketable products.

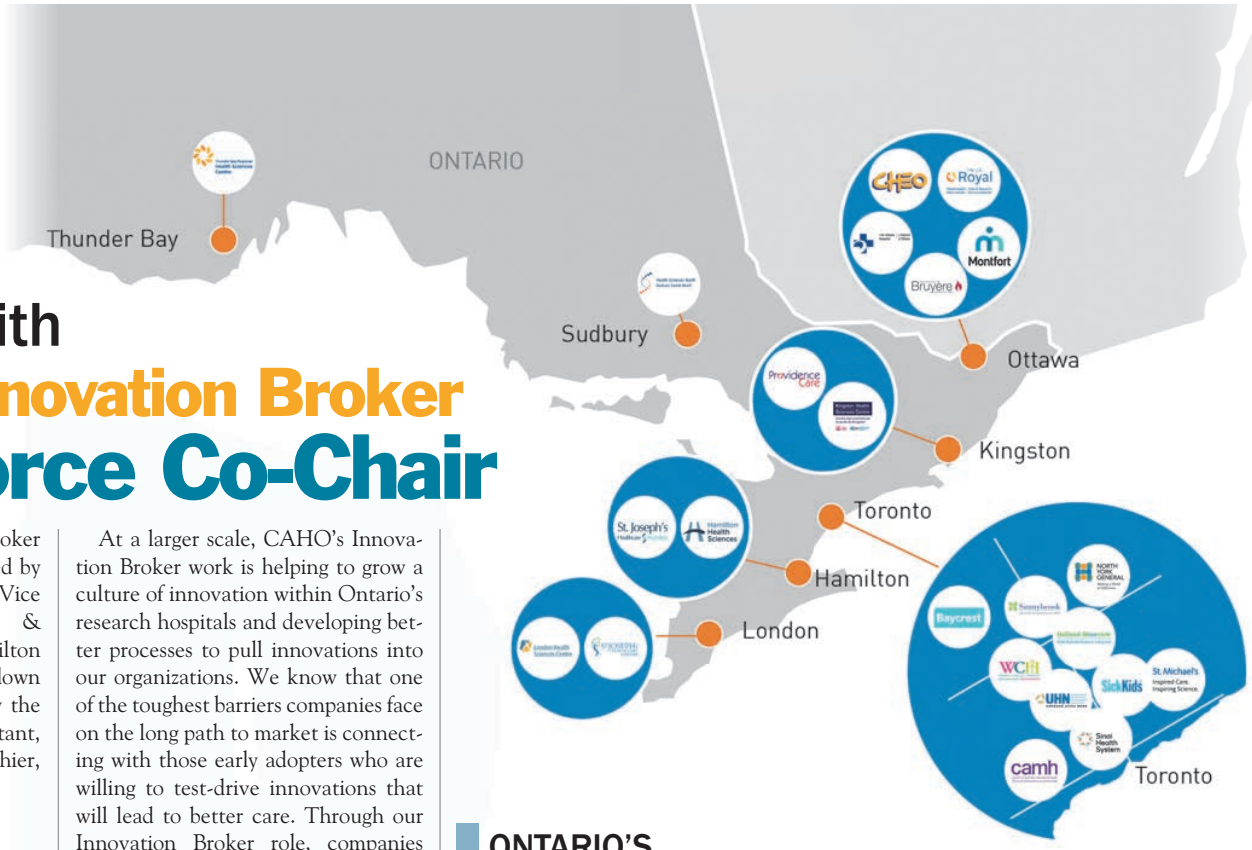
At a larger scale, CAHO's Innovation Broker work is helping to grow a culture of innovation within Ontario's research hospitals and developing better processes to pull innovations into our organizations. We know that one of the toughest barriers companies face on the long path to market is connecting with those early adopters who are willing to test-drive innovations that will lead to better care. Through our Innovation Broker role, companies only have to knock on one door to gain access to Ontario's 23 research hospitals, making those first connections a lot faster and easier.

Our hope is that this not only makes it easier for innovators to partner with us today, but that we're building a better system and better partnerships to improve innovation adoption long into the future.

HOW CAN ONTARIO'S INNOVATION BROKER WORK HELP FUEL A HEALTHIER, WEALTHIER, SMARTER PROVINCE?

The Innovation Broker work is really about re-thinking how we deliver healthcare. By providing a streamlined and transparent process for connecting healthcare providers and innovative companies, we will be able to do a better job of providing care and drive economic growth at the same time. Collectively, Ontario's Innovation Brokers are working to deliver a healthcare system powered by our world-leading research community in collaboration with our most promising industry partners. A more innovative health system is definitely a future we can all work towards. H

This interview was originally posted on CAHO's Healthier, Wealthier, Smarter blog. Check it out at healthierwealthiersmarter.ca



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Wait 1

Wait time for referrals from primary care to specialists, clinics, imaging, etc. and eConsults

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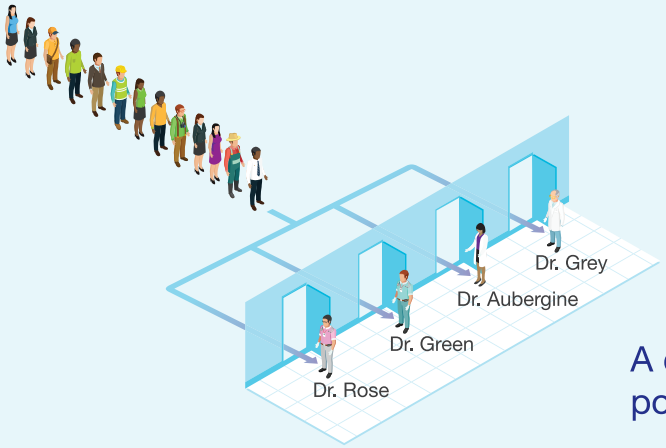
The Novari eRequest® module can manage both "direct" and "central intake" access models.



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Wait
2

Wait time for surgeries, endoscopies, etc.

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Wait
3

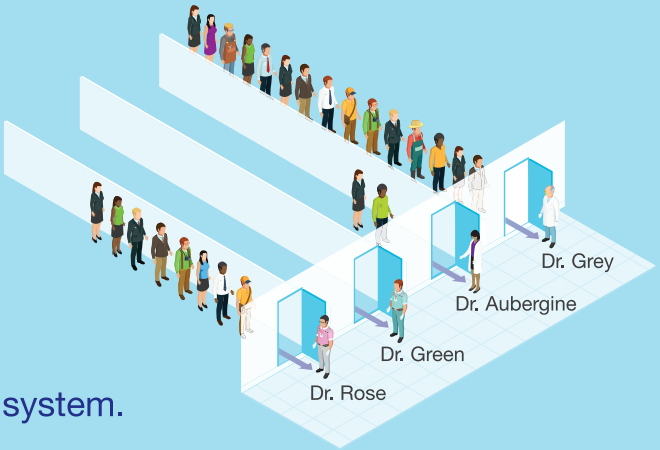
Wait time for post acute care discharge referrals, ALC, rehab, CCC, LTC, community care etc.

Sam's referral and all of our eReferrals are always complete and can be accepted with a click of a button.

Novari eRequest®

After surgery and a brief stay in hospital, the hospital staff used the Novari system to send and track my rehab referral.

or A direct or point-to-point system.



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Partnership with industry looks to enhance sepsis diagnosis

Alberta physicians will soon be evaluating new laboratory tests for improving the diagnosis and treatment of sepsis, a potentially fatal infection that develops in the bloodstream and major organs.

A four-way partnership has been struck between Alberta Innovates, Alberta Health Services (AHS), the Institute of Health Economics and bioMérieux to improve the way sepsis is managed in the province.

"This partnership represents a new way to interact with industry," says Dr. Blair O'Neill, Associate Chief Medical Officer with AHS' Strategic Clinical Networks™ (SCNs). "We struggle to determine which new technologies can help us care for patients for the best cost. Instead of simply looking at what's available off the shelf, we've sought collaboration with our industry partners to tailor a solution for Alberta's health system."

UP TO ONE IN FIVE ADMISSIONS TO INTENSIVE CARE UNITS IN THE PROVINCE ARE RELATED TO SEPSIS. OTHER JURISDICTIONS IN CANADA HAVE SIMILAR NUMBERS.

AHS, through its SCNs, has identified sepsis as a critical problem. Up to one in five admissions to intensive care units in the province are related to sepsis. Other jurisdictions in Canada have similar numbers.

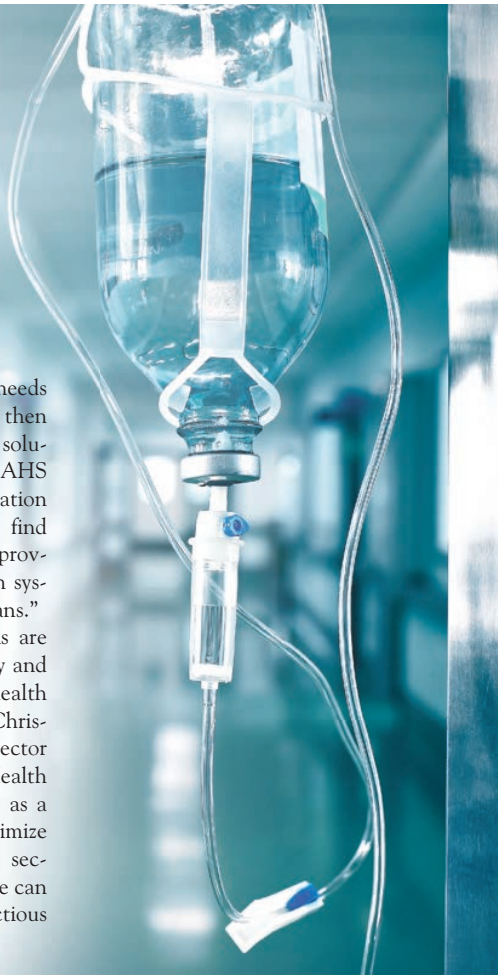
Sepsis is a potentially life-threatening complication of a body's response to an infection. Sepsis occurs when the body's attempt to fight the infection triggers inflammatory responses throughout the body. If left untreated, this inflammation can lead to damage to multiple organ systems, ultimately causing them to fail.

The sepsis diagnosis tools, VIDAS® B.R.A.H.M.S PCT™, and the rapid Biofire Film Array Panel (BCID), created by bioMérieux, will identify the presence of sepsis and aid in the identification of specific pathogens, helping physicians treat infections faster and more efficiently.

"Measuring PCT at clinical presentation and serially over four days will provide clinicians with high medical value information to help them identify patients who are at greatest risk of mortality and ultimately can result in improved, more targeted and intensified patient care and better medical outcomes," says Mark Miller, Chief Medical Officer at bioMérieux.

"In the past, doctors would treat sepsis with expensive broad-spectrum antibiotics, hoping to target the right bacteria," says Dr. Michael Meier, a physician with AHS' Critical Care SCN. "These new diagnostic tools will allow us to determine if the patient actually has sepsis and then the type of

THESE NEW DIAGNOSTIC TOOLS WILL ALLOW US TO DETERMINE IF THE PATIENT ACTUALLY HAS SEPSIS AND THEN THE TYPE OF SEPSIS A PATIENT MAY HAVE AND WHICH ANTIBIOTIC TO BEST TREAT THE INFECTION



sepsis a patient may have and which antibiotic to best treat the infection."

There are other benefits besides improved efficiency in choosing the most effective antibiotic. Limiting the range of antibiotics a patient is exposed to helps reduce the risk of them developing opportunistic infections like clostridium difficile, which can move in when a patient's gut microbiota is thrown out of balance by the arsenal of antibiotics.

Beginning this October, researchers in Edmonton and Calgary are assessing whether the diagnostic tests will lead to better treatments, prove cost-effective, and be adaptable to various clinical settings. The evaluations are expected to last between 12 and 18 months. However, it is establishing a better way for our strained healthcare system to continue to add new technologies to improve patient outcomes and measure their true value.

"Alberta Innovates is proud to have played a role in bringing the partners to the table," says Reg Joseph, Alberta Innovates, Vice President of Health. "We have created a platform for public-private partnerships that introduce innovative technologies into the healthcare system to fulfill a specific healthcare need in Alberta. Our job is to enable the healthcare ecosystem to improve patient outcomes for Albertans – that is exactly what we did here. I am thrilled to see all the excitement this initiative is generating throughout the Canadian healthcare landscape."

"Full credit to our Strategic Clinical Networks for working through a process whereby we identify critical needs within the health system, and then partner with industry to find solutions," says Dr. Kathryn Todd, AHS Vice-President Research, Innovation and Analytics. "Our goal is to find ways to more quickly introduce proven innovations across the health system, for the benefit of all Albertans."

"Unique partnerships like this are essential if we wish to effectively and efficiently address complex health system problems," adds Dr. Christopher McCabe, Executive Director and CEO of the Institute of Health Economics. "This project serves as a fantastic example of how to optimize health system experts, from all sectors, to discover ways in which we can better treat this and other infectious diseases." H

Value of Medical Technology Video Project showcases patient and clinician stories

In order to tell some of the countless stories of how medtech is improving patient care, enhancing clinical capabilities and contributing to health system sustainability, MEDEC, in collaboration with member companies and our health system partners, are undertaking a Value of Medical Technology Video Project.

The Value Medical of Technology Video Project utilizes the power of patient and clinician stories to showcase the many benefits of medical technologies and the valuable contributions they provide to patients, the healthcare system and to the economy of Canada. The technologies highlighted in the project typically have not yet reached optimal levels of adoption in Canada. The videos highlight innovative medical technologies and/or procedures that are enabled by technology, and aim to include a broad cross-section of sectors and patient demographics.

The videos that have been showcased so far are:

Y90 RADIOEMBOLIZATION

Y90 is a radioactive substance that is used as a medical device to treat cancers such as liver cancer. For liver cancer, Y90 is placed into microscopic beads which are then injected into the tumour in the patient's liver, where they emit a very high dose of radiation. According to Dr. Amol Mujoomdar of London Health Sciences Centre, the surgeon featured in the video, utilizing Y90 Radioembolization "is like going inside the tumour and punching it from the inside out." With about 2,000 cases of liver cancer diagnosed in Canada each year, Y90 is a less invasive approach to fighting this type of cancer.

Surgeons perform a Transcatheter Aortic Valve Implantation (TAVI) procedure on a patient in one of MEDEC's Value of Medical Technology videos.

TRANSCATHETER AORTIC VALVE IMPLANTATION (TAVI)

Transcatheter aortic valve implantation, or TAVI, enables replacement of the aortic valve without opening the chest. In the TAVI procedure, the valve is squeezed down onto a balloon, inserted into the body via a catheter, and tracked to the heart for implantation. This can be done without opening the chest or using the heart-lung pump. Benefits of TAVI include a shorter procedure, less pain, and a shorter stay in the hospital. Because it is a minimally invasive procedure, recovery time is significantly shorter than after open-heart surgery. As with surgical heart valve replacement, TAVI provides both short and long-term relief of symptoms, normal aortic valve function and improvement in patients' overall life expectancy and functioning.

PLEURAL EFFUSION

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DIGITAL PATHOLOGY

Pathology has traditionally involved taking samples of a patient's tissues and tumours, placing them on a glass slide and viewing them under a microscope. However, like much of the world, pathology is now moving to the digital realm. Technology is now available that allows for pathology samples to be digitized, which allows for the viewing of the samples digitally anywhere in the world. In this video, Dr. Victor Tron and Dr. Andrew Evans highlight the benefits of Digital Pathology and how Canada can be a leader in this field.

These videos can be viewed on MEDEC's YouTube page. Stay tuned for additional videos in 2018!

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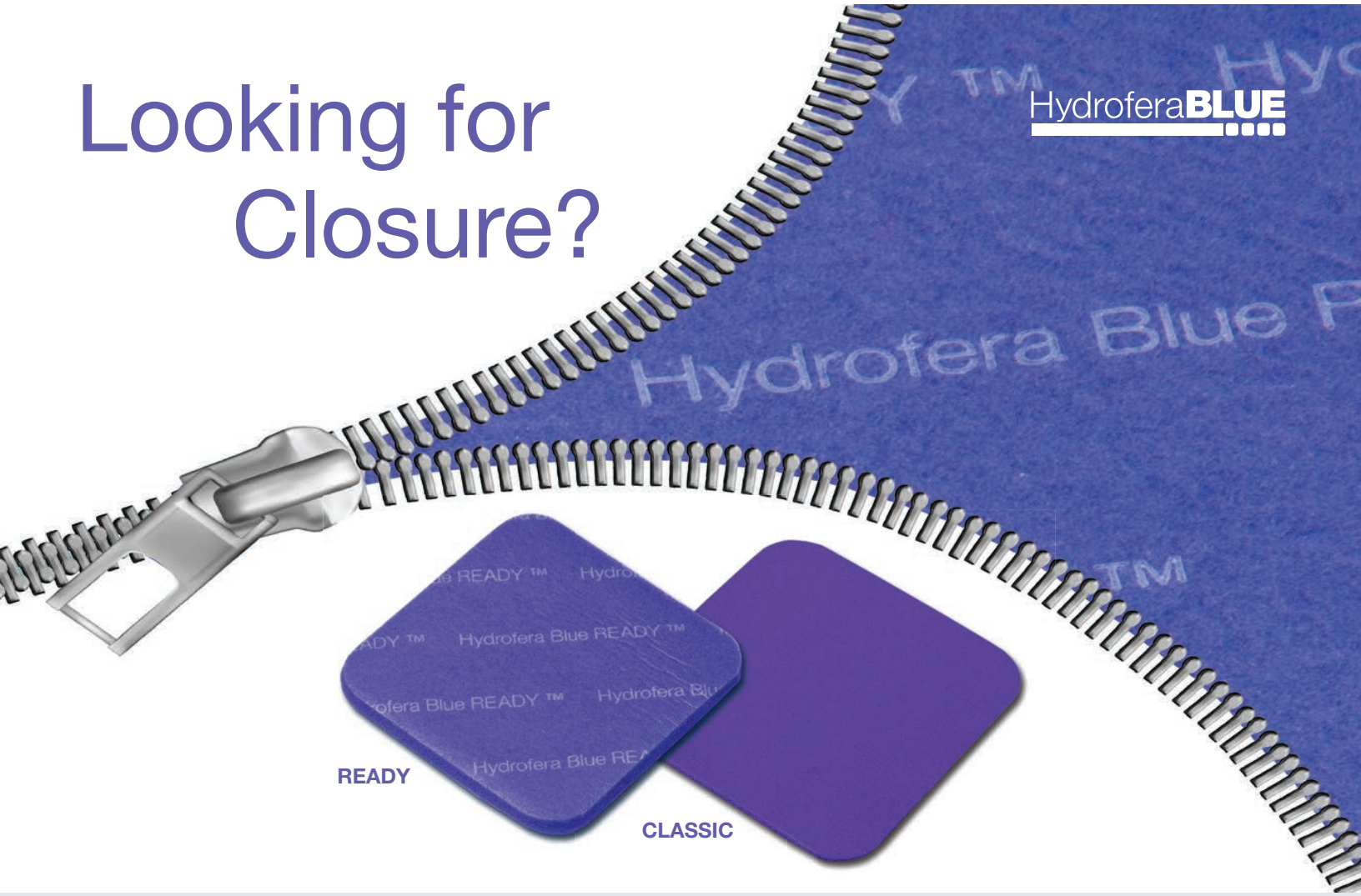

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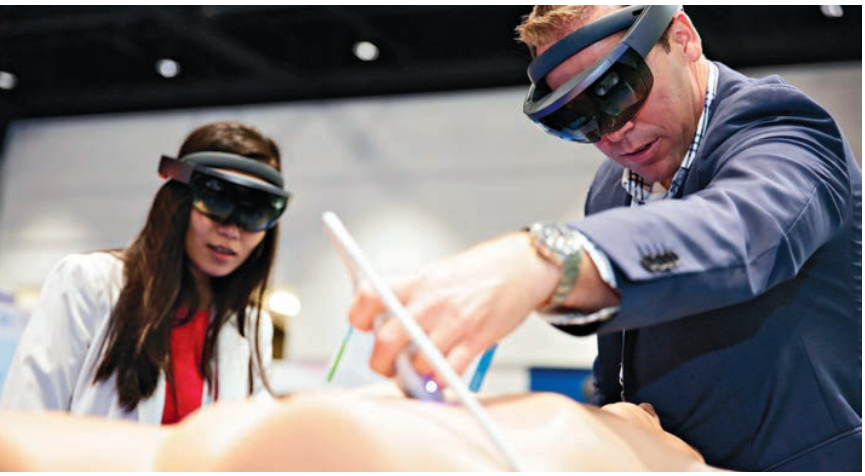

Largest medical technology conference in North America coming to Canada

The Advanced Medical Technology Association (AdvaMed), MEDEC's counterpart association in the United States, is bringing its annual MedTech Conference to the Metro Toronto Convention Centre from October 5-7, 2020. With this decision, organizers have chosen Canada to be the first host country for the conference outside the United States.

The MedTech Conference, which attracts more than 2,600 attendees from around the world each year for three days of educational programming, networking opportunities and more, is the largest medical technology-focused conference in North America.

AdvaMed's decision to bring the conference to Canada was based on multiple factors, but a significant impetus was the positive change taking place in Canada's medtech environment.

"Canada is becoming more and more of a medtech power each year," says Scott Whitaker, president and CEO, AdvaMed. "The Canadian government's Innovation Agenda and Ontario's newly established Office of the Chief Health Innovation Strategist sent a strong signal that the country is open for business. We look forward to working with our local partners to showcase Toronto's booming health technology ecosystem at The MedTech Conference in 2020."

Ontario's Chief Health Innovation Strategist, William Charnetski, says that this decision speaks to the collaboration around innovation that is taking place in the province's healthcare system.

"Awarding The MedTech Conference to the City of Toronto is further evidence that our work, together with collaborators in the system, is catalyzing and growing a thriving health innovation ecosystem in Ontario. Our office is thrilled to be a key partner welcoming the world's top leaders in health innovation to Toronto in 2020," says Charnetski.

Ontario Health Minister Dr. Eric Hoskins believes that this international conference offers a terrific opportunity for the province. "In choosing Ontario, our province will showcase its leadership in the medical technology sector and be recognized as a leading North American hub for health innovation," says Minister Hoskins.

AdvaMed will partner with MEDEC to ensure that the conference reflects and highlights the local Canadian medtech community, which is home to more than 1,500 medical technology companies.

"We're very pleased that the largest medical technology-focused conference in North America has chosen Toronto to be its first host city outside the United States," says Brian Lewis, President and CEO, MEDEC.

"Great things are happening in the Canadian medtech marketplace, and we look forward to working closely with AdvaMed and The MedTech Conference planning team to showcase opportunities for innovators and contributing to this world-class event."

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Canada's MedTech Conference presented by MEDEC is the country's preeminent information exchange and educational forum involving medical technology – tackling issues such as the adoption of innovation and opportunities to foster transformation within the healthcare system. Attendees will hear from and engage with high profile health system leaders and network with colleagues. Previous year's conferences have hosted dignitaries such as Ministers of Health, Hospital CEOs and other influential thought leaders. This year is shaping up to be no different!

This year's conference will feature a variety of breakout sessions that will be engaging and informative to health system leaders. Be sure to follow MEDEC on Twitter and LinkedIn for conference updates and announcements!

Visit **www.medec.org/events** for more information

Members of the Markham Stouffville Hospital surgical department working group reviewing training components of myCTE.

Improving the patient experience

means going back to the basics at Markham Stouffville Hospital

By Yeena Peng

In mathematics it's called the chaos theory: a very small change may make the system behave completely differently (hopefully for the better).

But at Markham Stouffville Hospital (MSH) it is called, myCTE (my Care, my Team, my Experience). A new collaborative care model introduced last year that modified the way we deliver care to our patients, by making little changes that lead to big impact.

The collaborative care model is not new; along with the countless amount of literature on the topic, hospitals have been implementing various aspects of the model into care for some time now. But what is new, is MSH's back to basics approach to developing, testing, executing and refining our unique model of care incorporating the idea that little changes make big things happen.

myCTE was developed with the specific needs of the Markham Stouffville Hospital and community, in mind. It was developed with input from patients and caregivers – over 67 patients and family members were interviewed, and staff members from across disciplines in the hospital – total of 75 staff were interviewed, physicians, allied health, nurses, porters, etc. And the core development team comprised predominantly of frontline staff, sharing their perspectives.

The focus of MSH's care delivery model supports patient and family centred care, promotes leading practices and is interprofessional in nature. By implementing this model MSH hoped to improve patient and family experience, empower patients with knowledge of their care received to date and promote proactive measurement, issues management, and ideas generation among staff.

The core components of myCTE include:

- Unit huddles: Units huddle daily to learn about what they need to know for the day.
- Team-based care: Nursing staff are now part of a team of three nurses responsible for 15 or so patients rather than one nurse to five patients, each sharing responsibility and information about all 15 patients.
- Bedside handover: Handover is done at the patient bedside rather than in nursing station, so the patient is included in the transfer of care and involved in their care planning.
- Post discharge phone calls: Follow-up with patients once they have left the hospital, part of the continuum of care.
- Hourly 5P rounds: Patients are visited by a nurse each hour to ensure their needs are met and communicated with regularly. The five P's stand for: pain, personal hygiene, position, personal belongings and pump.
- Communication boards: Information on boards for staff and patients that include dietary information, goals, daily activity, personal information and preferences to allow for better two-way communication.
- Patient and family guidebook: provided to all patients and families with detailed information about the hospital, their stay in the hospital, etc., making it easily accessible.

"It's not about epic solutions or solving massive problems overnight. This model of care is about building momentum through incremental change," says Michelle Samm, Director of Patient Experience at MSH. "It's about bringing a team together in a new and different way, ensuring patients/families are contributors in their plan of care. It's about improving communications both ways for patients/families and staff."

For example, by introducing the team-based care approach, it eliminates the 'I'm not sure, let me go find your nurse' response. Patients can feel confident that staff are knowledgeable about their condition and can answer their questions without having to wait. Nobody likes being told in a restaurant to wait until I find your waiter before I can help you. And patients feel the same, when they ask questions, they want to know that staff – no matter who they ask – can help them.

"We are making small improvements which may seem trivial to the lay person, but monumental to patient," says Samm.

"It's showing our patients that we are making changes, visible changes and are headed in the right direction. It's an ongoing process."

Since implementation started in 2016, myCTE has been rolled out in 50 per cent of the hospital in the medicine and surgical units. The hospital expects 100 per cent adoption by 2018.

Not only has the program vastly improved the patient experience, it has also had a positive impact on staff as well. Staff are now armed with knowledge, spend more time with patients and complete a fuller scope of practice within all disciplines.

"I've noticed since implementing myCTE my team better understand how the entire unit works. Work is no longer siloed," says Sheila Hogan, Patient Care Manager, Surgical Program at MSH. "With the implementation of myCTE there is more accountability. In our department, now any care provider in any discipline (e.g., personal support worker) can chart directly into the electronic medical record."

myCTE was and continues to be a shift in how MSH staff work together to deliver excellent patient care. The goal of myCTE is constant improvement, incremental changes that lead to greater impact on the overall patient experience. H

Yeena Peng is the Senior Corporate Communications Specialist at Markham Stouffville Hospital.

Fostering inclusive care for all families

By Erica Di Maio

"How is mom feeling today?" "I need dad to step outside of the room for the epidural."

"After birth, you will be moved to the 'Mother and baby unit'."

While these gendered terms are used commonly throughout Ontario and Canadian hospitals, Michael Garron Hospital (MGH), Toronto East Health Network is making significant efforts to use gender diverse terms and foster an LGBTQ inclusive environment for all families.

For Asish Purushan and Krishneel Lall, a married male same-sex couple who welcomed baby Sidharth to their family this summer, these efforts have fundamentally shifted their perspective on what it means to experience parenthood in a way they could never have imagined.

Simply put, they have been empowered as key decision makers and players in a process they had expected to be mere spectators in.

Asish, who immigrated to Canada from India, had been living in Toronto's Cabbage town for more than 10 years. Krishneel, born in Fiji, moved to California, United States, with his mother and sisters; a chance meeting in Toronto would bring Asish and Krishneel together in 2007.

The two connected instantly and bonded over their shared values of one day raising children. When the US introduced the same-sex marriage law in 2013, they married in California and two years later, Asish moved to the east coast to live with Krishneel and begin their surrogacy journey.

After a two-year waiting process, Asish and Krishneel were matched with Toronto surrogate Mazyline McCarthy, wife and mother of three who delivered all of her children at MGH.

"I spoke with several couples, but when I met Asish and Krishneel there was an instant spark," says Mazyline. "We had similar values and knew where we wanted the journey to take us."

Next, it was time to find an egg donor.

After an initial setback of finding an egg donor who later determined they were not comfortable donating to a same-sex couple, Asish and Krishneel were able to secure an alternative donor.

After a successful embryo transfer procedure, which is the final step of the in vitro fertilization process, Mazyline became pregnant.

As the baby's due date quickly approached, Dr. Brenda Woods, obstetrician and gynecologist, advised Asish, Krishneel and Mazyline to set up a meeting with the hospital's Family Birthing Centre team to prepare for the delivery of the baby.

But when it came time to meet with the hospital, Asish admits he had reservations.

"Living as a gay man and man of colour, I'm always very conscious of how I present myself and how people might perceive me," he says.

"I had heard experiences where same-sex parents were not given access to the room or child. Having a baby is a milestone that is sometimes minimized for gay couples."

Dr. Helena Frecker, obstetrician and gynecologist who specializes in LGBTQ and Gender Diverse Care, explains the importance of inclusivity during all hospital interactions and removing any potential barriers to accessing care.

"Many LGBTQ+ patients and community members have experienced discrimination and stigma within the healthcare system, and

Proud parents Asish Purushan (left) and Krishneel Lall (right) welcome baby Sidharth to their family with surrogate Mazyline McCarthy and their obstetrician and gynecologist, Dr. Brenda Woods.

Photo: Michael Garron Hospital

this can often lead to avoidance of care. This is especially true for transgender individuals," says Dr. Frecker.

"Changing the healthcare environment and implementing gender inclusive training and education for all providers is key to creating safe spaces for all of our patients and staff."

When Asish and Mazyline met with Jennifer Bordin, Manager, Maternal, Newborn & Child Health Services, they were overwhelmed by the level of support from the team. They were educated on the hospital's surrogacy policy, toured the unit and developed a birthing plan that all parties would be comfortable with during and after the delivery of the baby.

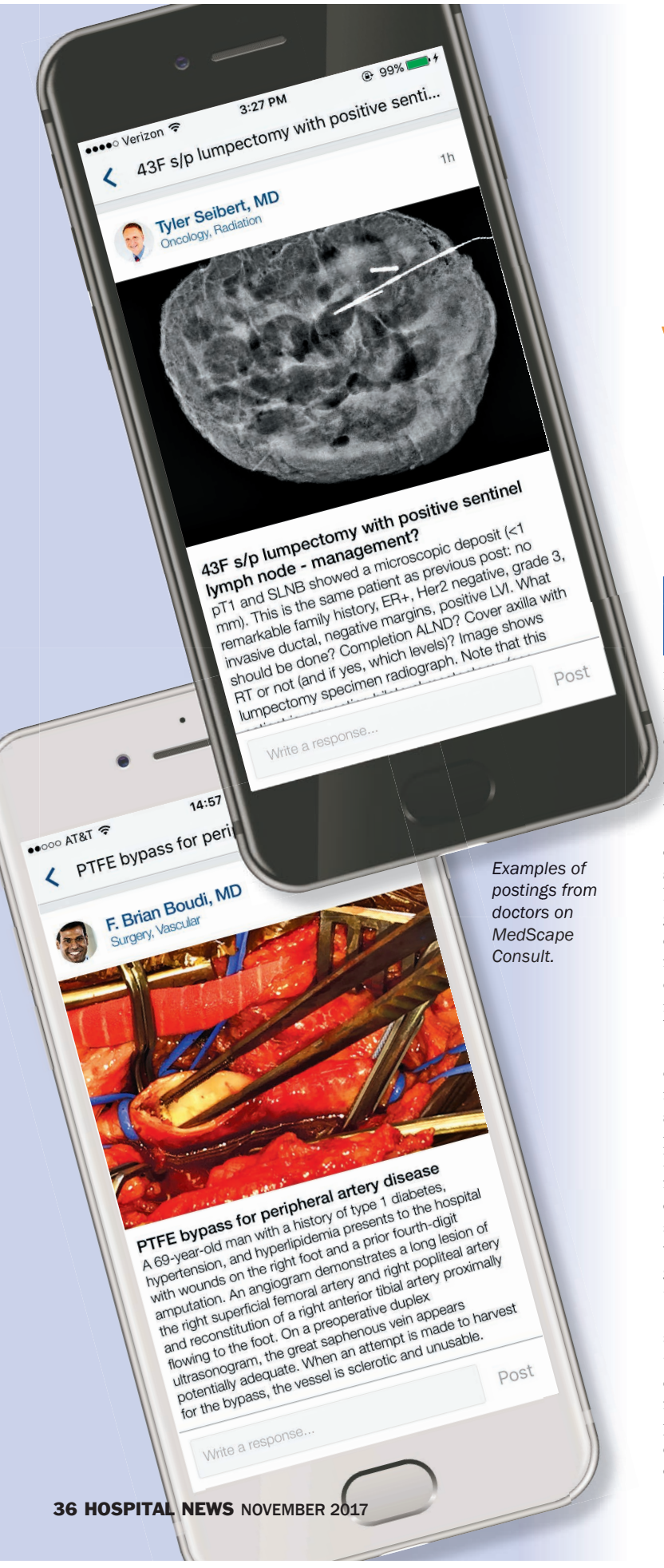
"Jennifer asked us questions about the birthing plan that we hadn't even thought about because we didn't realize we would be given these choices during the process," says Asish.

"We were totally blown away. It was a beautiful experience – so kind, inclusive and thoughtful."

The Family Birthing Centre formed an LGBTQ Committee earlier this year. The Committee has participated in Toronto Pride, reached out to LGBTQ families for feedback on their care, organized hospital rounds with same-sex couples sharing their experiences, updated the pre-admission questionnaire to use inclusive language and gender-neutral pronouns, and implemented positive space signs on the unit.

MGH has partnered with The 519 since 2015 to provide inclusion training to staff – to date, 400 frontline staff have received training. H

Erica Di Maio is Senior Consultant, Corporate Communications at Michael Garron Hospital.



Examples of postings from doctors on MedScape Consult.

Collective wisdom:

How crowdsourcing can improve healthcare

By Dr. Sonny Kohli

A routine day in the clinic can quickly turn atypical when a patient presents with something unfamiliar: A middle-aged male with a palate lesion; superficial veins in the neck of an 18-year-old; an obese, heavy smoker with non-itchy vesicular rash.

You can make a diagnosis, but you're thinking that a quick check-in with colleagues could provide valuable insight. That said, with the press of patients waiting to be seen, and schedules that no longer allow for even hallway chats, curbside consults often go by the wayside. However, in the digital environment, there's no need for a doctor's lounge. With physician crowdsourcing platforms, you only need a laptop or smartphone to touch base with colleagues.

As an internist and critical care specialist, I first engaged in crowdsourced medicine in late 2015 through Medscape Consult, the peer-to-peer digital platform offered to physicians through Medscape, the medical news and information site for physicians. In one of my first posts, I uploaded a photo of a 72-year-old woman who presented with right hand pain, swelling, and low grade fever that had developed over the course of one day. Her WBC was 14, but the uric acid level was normal and there was no bacteria upon aspiration. The community jumped in with discussion and suggestions – from infection to CPPD (calcium pyrophosphate dehydrate) crystal deposition disease – (it turned out to be severe osteoarthritis and pseudo gout). It was exciting, and I was sold on the value of virtual conversations.

I started out as a case contributor for Consult, posting interesting cases from my practice to prompt learning and discussion and went on to become an editor, weighing in with advice on critical care cases. But I still continue to reach out for help from colleagues.

I have communicated with physicians across specialties and around the world, viewed discussions with fellow clinicians, and shared cases, asked questions and discussed best practices. The volume of responses has continued to increase as physicians – including perhaps some previous skeptics – have given crowdsourcing a try and now recognize the value of connecting with colleagues in a quick, meaningful, and occasionally amusing way.

In one discussion, a physician shared a case of a patient who developed a strange blemish at the injection site during a routine blood draw, which quickly spread up her arm. Her post generated responses from colleagues in more than 50 countries and in 13 specialties, with answers ranging from phlebitis to a fungal infection. The response that proved correct was a case of sun sensitivity, exacerbated by the presence of limes – most likely from drinking a margarita in the sun. Another physician volunteered that she had also seen it happen with martinis.

In all, the few minutes I spend in virtual conversations have enhanced my professional life as well as my practice. That said, in Canada, the impact of physician crowdsourcing may go

beyond individual practice to potentially helping to alleviate the current challenges to the healthcare system.

For physicians understandably concerned about health privacy, credible crowdsourcing platforms safeguard the identities and ensure ultimate privacy of patient information. Medscape Consult protects patients by requiring that all identifying information is removed from text and images. Comments and posts are moderated 24/7. Consult is accessible only by registered physicians.

CAN CROWDSOURCING HELP EASE HEALTHCARE STRESSORS?

As Canadian physicians, we find ourselves inundated during the practice day, with patient and staff demands, bureaucracy, and the push of a patient load and extended wait times brought on by physician shortages. While the issue demands broad-scale, focused solutions, crowdsourcing may help by potentially streamlining diagnosis and supporting a treatment rationale that helps avoid unnecessary and costly interventions.

IN CANADA, THE IMPACT OF PHYSICIAN CROWDSOURCING MAY GO BEYOND INDIVIDUAL PRACTICE TO POTENTIALLY HELPING TO ALLEVIATE THE CURRENT CHALLENGES TO THE HEALTHCARE SYSTEM.

Additionally, virtual knowledge sharing can help close the knowledge gap with colleagues in rural and remote settings, potentially enhancing the quality and efficiency of care. Doctors in resource-poor settings can upload images, post medical lab image results, and hear from pathologists and other specialists. Crowdsourcing can help narrow the divide between 'our world and theirs' as it creates a true global medical community – a global medical village, if you like.

A crowdsourcing platform is accessible to any physician with a smartphone – regardless of healthcare or payer system. One day after Medscape Consult launched, a South American paediatrician posted that he was seeing a spike in babies born with microcephaly in areas that had recently seen a wave of Zika infections. He asked about a possible connection to the Zika virus weeks prior to health organizations' alerts about the epidemic.

Similarly, doctors in more remote areas may support a diagnosis in a patient exhibiting symptoms that are rarely seen in a more developed region.

Continued on page 47

Dr. Sonny Kohli, MD FRCPC, is an Internal Medicine/Critical Care specialist in Ontario Canada, Assistant Adjunct Clinical Professor at McMaster University, Co-founder and Chief Medical Officer of Cloud Dx, and a 2017 recipient of the 'Bold, Epic, Innovator Award' in the Qualcomm Tricorder XPRIZE competition .

Putting patients at the centre of hospital quality and performance indicators

By Elaine O'Connor

Photo credit: Wendy D Photography

Dr. John Hwang and his team are focusing on patient experience as a driver for change.

Dr. John Hwang started with an idea: look beyond the key performance indicators to patients for quality improvement initiatives.

In 2013, the general surgeon moved out of the operating room and into data-driven healthcare innovation as the National Surgical Quality Improvement Program (NSQIP) Surgical Champion at Fraser Health Authority's Royal Columbian Hospital in New Westminster, B.C.

His role is to help surgical teams reduce complications and enhance post-operative patients' recoveries so they can be independent at home sooner, which reduces the burden of long stays on the system and improves patient outcomes. It's a complex task.

"Royal Columbian is a big hospital and we can see a lot of complications, because we do such complex surgeries," explains Dr. Hwang. "Yet something you notice is that the quality improvement numbers never really change, and I wondered why."

He found the key at a conference in the U.S. where he learned frontline engagement and employee-driven quality improvement delivered longer term success.

So in 2015 he set out to reinvent quality improvement at the hospital.

"We start with the patient experience," Dr. Hwang says. "We develop relationships with our patients, our nurses, our frontline employees and we ask them what is going well that we can duplicate and what is not going well that we can improve. You gauge success on whether patients say their experience is better. If you can improve their experience, then the numbers usually improve."

Now, this surgeon and his team are placing a stronger focus on patient experience as a driver for change. With data in hand, they are beginning at the bedside: asking patients themselves what could help them recover more effectively after surgery.

Dr. Hwang collaborated with Fraser Health leadership, surgical quality team, and hospital foundation to create a set of surgical check-ins, workshops for frontline employees, and an annual surgical research day event. Employees generated their own quality improvement initiatives with quality improvement grants from the foundation and NSQIP data was made more accessible and actionable for care providers.

The team has used this method with vascular surgery patients, who were staying in hospital for weeks to a month more than the standard three to five days, and sometimes returned with infections or complications. Nurses identified the issue was that patients didn't feel secure enough to recover at home. So the nursing team's #Sendmehome project created an educational discharge package for patients, complete with hand sanitizer, numbers to call if something goes wrong and follow-up phone check-ins.

These initiatives helped promote safe discharges, while operational changes, including the hiring of a nurse practitioner and creation of a vascular wound outpatient clinic contributed to the work. The result? Average length of stays are down significantly – from a high of approximately 20 days in January 2017 to 4.5 days in July – and hospital management is convinced they will stay there.

For his efforts, Dr. Hwang was honoured with a Fraser Health Above and Beyond Awards Innovator Award in September.

"He has changed the culture on my surgical units and has inspired my managers and frontline employees to make quality improvement a part of their daily work," says Barb Sutherland, Royal Columbian Hospital's Clinical Director for Surgery. "He will not be satisfied until we have no hospital infections." H

Elaine O'Connor is Senior Consultant, Communications at Fraser Health in BC.

New patient experience tool provides insights to help improve care

We are asked to take surveys all the time and the appreciation and use of consumer data is higher than it has ever been. We are polled about new products, political views or customer satisfaction—often with the promise of a small gift, such as a discount code or loyalty points.

With this in mind, imagine the insight that can be gained from understanding the patients' perspective on the quality of their own hospital care.

A patient's experience provides valuable information that can be used to assess the delivery of patient-centered care. There is currently a gap in pan-Canadian patient experience data and the Canadian Institute for Health Information (CIHI) has been working to fill that void. CIHI, in collaboration with provinces, regions and facilities has developed a patient experience survey for Canadian acute care hospitals to support improvements for patients.

THE SURVEY

The Canadian Patient Experience Survey – Inpatient Care (CPES-IC) is a standardized questionnaire that enables patients to provide feedback about the quality of care they received during their most recent stay in a Canadian acute care hospital.

To date, five provinces (New Brunswick, Ontario, Manitoba, Alberta, and British Columbia) are using the CPES-IC and several others have expressed interest.

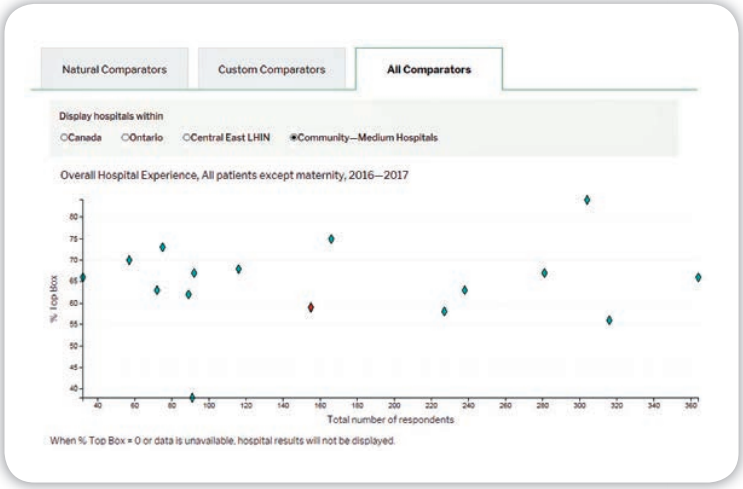
THE TOOL

In August, CIHI launched the CPES: Comparative Results tool, a new secure online tool that provides comparative results for over 100 acute care hospitals from New Brunswick, Manitoba and Ontario. The tool will continue to expand as CIHI receives data from additional jurisdictions. CPES-IC currently holds 22 patient experience measures, such as communication with doctors, staff responsiveness and pain control, among others.

This tool was designed to support quality improvement and benchmarking across Canada. Participating organizations are able to compare hospital-level reports with peers within their region, province, and the overall average from participating facilities.

The tool has an array of functionalities so users can customize comparisons and how results are viewed. Key features include:

- Comparative hospital-level data
- Comparisons to natural comparators (i.e. hospital peer group, regional, and provincial averages), and customized comparisons to other hospitals
- Creating a customized analysis that will provide additional information around potential drivers for improvement and adjusted results.



When asked about the tool, Deanna Rothwell, Manager of Performance Measurement at the Ottawa Hospital said "Another high quality product from CIHI. I really like the visual displays, the ease of choosing comparator hospitals and the ability to download the data. I'm looking forward to seeing results roll in from across Canada so that our hospital can compare itself to other academic centres in Ontario and other provinces."

Continued on page 47

This article was submitted by the Canadian Institute for Health Information.

Revolutionary new breast imaging technology

By Dahlia Reich

St. Joseph's Hospital, part of St. Joseph's Health Care London, has become the first Canadian hospital to install the latest in mammography technology that allows patients to personally control and adjust the rate of compression during the exam.

The Senographe Pristina designed by GE Healthcare is a groundbreaking new breast imaging platform designed by women for women. The mammography machine allows patients to take breast health into their own hands – literally – with a first in-industry, patient-assisted compression tool. Using a remote, patients choose the amount of compression according to their comfort level.

The Pristina mammography unit, now in use at St. Joseph's, is the first in North America to be equipped with this tool. The feature reduces anxiety and enhances comfort, allowing technologists to focus on precise positioning making the exam easier and faster.

"The new Pristina mammography unit offers a totally different mammography experience for women. It's a complete departure from the mammogram exam as we know it," says Dr. Anat Kornecki, Medical Director, Breast Imaging, at St. Joseph's Breast Care Program. "I believe the innovative design of the Pristina will be more inviting for women and help us improve the screening rates so vital to cancer prevention."

Other features of the Senographe Pristina and the exam room are also designed for patient comfort:

- All parts of the unit in contact with the patient's breasts have gentle, rounded corners to help reduce discomfort.
- The system features comfortable armrests that relax the pectoral muscles to simplify positioning, compression and image acquisition. With regular mammograms, women are positioned in a way that projects stress on the handles of the machine, which tenses pectoral muscles and impacts image quality.
- A sensory suite in the exam room allows patients to enjoy a soothing ambiance with music and various scenes on a screen.

On far right, Susan Forde, Betty Powell and Jane Terhaerdt are among the first patients in Canada to have benefitted from the Senographe Pristina mammography unit. With them is radiologist Dr. Anat Kornecki, left, Medical Director, Breast Imaging, at St. Joseph's Breast Care Program.

"When women are relaxed and comfortable during an exam, there is less movement, which enhances the quality of the images we are able to obtain," adds Dr. Kornecki. "Better images improve our ability to catch and diagnose breast abnormalities early."

London area patients, who are the first in Canada to try the unit, are giving the machine rave reviews in comparison to previous mammogram experiences.

"It's night and day," says Susan Forde, 65, who has had regular mammogram screening since turning 50. "I didn't have that sense that I wanted to pull away. It didn't feel like I was having a mammogram. It felt like nothing. Before I knew it, it was done. Being in control of the compression was fascinating. It's a game changer."

Jane Terhaerdt also appreciated the compression control feature. "That was great. It allows you to feel autonomous. When you have control you relax, which helps with the whole process."

For Betty Powell, being positioned on the machine was much easier than in the past. "You don't have to be a contortionist. It's almost like the machine fit around me."

Research shows that fear of pain is one of the most common reasons women don't schedule a mammogram.

For the technolgists, the machine is more ergonomically friendly, making it much easier to manoeuvre and to position patients, says Sandra MacFarlane, Technical Coordinator, Mammography, at St. Joseph's. "This means less strain for technolgists while also getting better images."

St. Joseph's Hospital is the primary location for hospital-based breast imaging, diagnostic and surgery services in London, and an affiliate of the Ontario Breast Cancer Screening Program. Approximately 100 patients a day receive breast imaging at St. Joseph's

In the coming months, St. Joseph's will receive an additional four Senographe Pristina units, which will replace all of its mammography machines. H

Dahlia Reich works in Communications and Public Affairs at St. Joseph's Health Care London.

Three reasons the operating room needs actionable data now

By Dennis Kogan

For most surgeries, the potential for complications is always present, especially for certain high risk patients. Many hospitals are taking advanced measures to counter this possibility, with a focus on preventing undesirable variation at key points during the episode of care. This especially includes critical care transitions such as between prep and surgery, and surgery and recovery.

Specifically, these hospitals use analytics solutions that are embedded directly within perioperative workflows. Such technology converges IoT tools with healthcare analytics to produce actionable data – that is, data which is near real time and relevant to the patient, and can be acted on during the episode of care. Moreover, actionable data's value can be extended to identify effective training protocols and to standardize best practices.

Three scenarios, in particular, are calling for an intensive effort to deploy actionable data in the operating room – and they are only increasing in urgency.

AGING POPULATION

This spring, news headlines reported that for the first time ever, there are more seniors in Canada than children. Like other developed countries, Canada's population is aging. This means that Canadian operating rooms are performing surgery on ever frailer, geriatric patient pools. Indeed, it is fair to say that the Canadian health system should be recalibrated to accommodate the imminent influx of aging, high-risk patients. One key point to keep in mind: more can go wrong when operating on today's higher risk geriatric pool. Thus, surgeons will greatly benefit from having actionable data

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Data now

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which alerts when procedures are veering away from best practices during the episode of care.

Consider two common categories of procedures performed on the elderly: cardiac surgery and joint replacement surgery. While the latter now can be performed with minimum invasiveness, elderly patients are still at higher risk of infections and other complications. Meanwhile, geriatrics make up a significant share of patients for cardiac surgeries. For this higher risk pool of patients, it is even more important to adhere to best practices to avoid unnecessary variation that contributes to unacceptably high mortality rates and costs.

RISING PATIENT VOLUME

Also like other developed countries, Canada's population is increasing, with immigration fueling much of this growth. At the same time, the country's doctors are aging, which is contributing to a persistent shortage in their numbers. In plain terms, surgeons are handling more cases, which present more chances for errors. Once again, actionable data in the operating room is an effective strategy to mitigate downstream issues. As a regular component of surgery, actionable data enables surgeons to ramp up faster on more procedures, including implants of new devices.

ACQUIRING ACTIONABLE DATA DEPENDS ON AGGREGATING BOTH STRUCTURED AND UNSTRUCTURED PERIOPERATIVE DATA, PLUS SMART INTEGRATION OF KEY SYSTEMS AND DEVICES.

MORE POST-GRADUATE TRAINING NEEDED

More broadly, regular use of actionable data instills a culture of continuous learning for residents and other "apprentice" clinicians. An advanced solution should enable surgeons to review episodes, add notation and collect feedback. Now surgeons have a tremendous aid for understanding – and teaching – others, drivers of unnecessary clinical variation in the operating room.

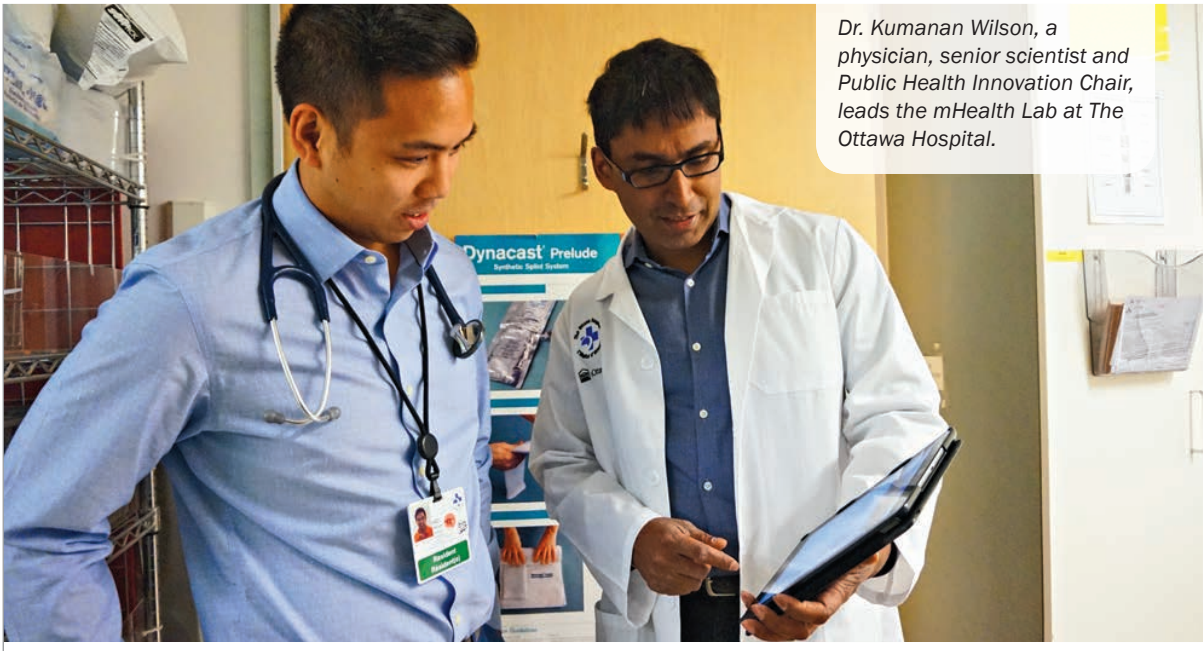
This can be particularly impactful for Canada's cardiac residents, who enter cardiac residency programs directly from medical school. Potential also exists to weave operating room actionable data into Canada's various continuing medical education programs beyond residency.

The many needs for actionable data in the operating room are clear. Less so may be how to actually access this data. In brief, acquiring actionable data depends on aggregating both structured and unstructured perioperative data, plus smart integration of key systems and devices. Physician leadership and championship also are essential. After all, it is physicians who play the most prominent and certainly most direct role in the patient's outcome. With actionable data at hand, physicians have an effective means to assure these outcomes are positive. H

Dennis Kogan is the CEO and Co-Founder of caresyntax, which reduces surgical variability and improves patient outcomes through data-driven integration and performance management tools.

mHealth: Healthcare on the go at The Ottawa Hospital

By Season Osborne



Dr. Kumanan Wilson, a physician, senior scientist and Public Health Innovation Chair, leads the mHealth Lab at The Ottawa Hospital.

The mHealth Lab at The Ottawa Hospital, led by Dr. Kumanan Wilson, is creating innovative, practical easy-to-use apps and new mobile platforms for people to manage their health information on their phones, tablets, or other wireless devices to be more involved in their own healthcare.

CANIMMUNIZE

Jennifer Wolfenden is a nurse at McMaster's Children's Hospital in Hamilton. The mother of three said she lost her first son's immunization record, and would often forget to bring the immunization booklet to the doctor's office. But her problems were solved when she found CANImmunize online and downloaded the app. She got all her family's immunization records from her doctor and input them into her phone.

"I don't have to think about it. It tells me when immunizations are due. I absolutely love it," says Wolfenden.

The idea for a mobile app to help people keep track of their immunization records came about in 2012, when a mother complained about paper immunization records to Dr. Wilson, a physician, senior scientist and Public Health Innovation Chair.

"We came at this from a user perspective," he says. "We wanted to empower the individual to track their vaccinations, get accurate info about vaccines, and to schedule appointments."

As each province and territory manages their health information differently, CANImmunize offers a potential solution to help address information gaps at the public and systems level. CANImmunize can be downloaded for free on the App Store for iOS and Google Play for Android devices. To date, nearly 210,000 people have downloaded the app.

RECOVER NOW

Jerry Welsh was working an early morning shift on the Cumberland Ferry near Ottawa in January 2017, when his speech got oddly scrambled. He was having a stroke.

Welsh didn't suffer paralysis, but his speech was affected. He was assessed at The Ottawa Hospital and found to be a candidate for a feasibility study to use a tablet to help with his speech and language therapy.

Stroke specialist Dr. Dar Dowlatshahi and his colleagues realized that stroke patients spend long hours and days waiting for therapy. Canadian studies show that stroke patients wait on average two weeks before they get rehabilitation therapy.

"We thought we could use a device to deliver early therapy while patients are in their beds, which solves the problem of waiting," says Dr. Dowlatshahi.

The mHealth team built a first-of-its-kind platform called RecoverNow that works on Android tablets and uses commercially available apps during stroke and speech therapy. It allows clinicians to tailor the therapy to each patient by selecting publicly-available apps from the Google Play store. Healthcare staff can change the apps throughout the course of treatment and monitor patients' progress in real time.

"I tried the tablet and it just helped," says Welsh. "I started having better progress in communicating."

Welsh is confident that RecoverNow was a valuable part of his stroke recovery treatment.

Dr. Dowlatshahi is conducting a randomized clinical trial to determine the effectiveness of RecoverNow as a medical device so that it can be widely incorporated into stroke treatment in hospitals across the country.

THE OTTAWA RULES

The Ottawa Rules is a mobile and web-based version of the Ottawa Knee Rule, the Ottawa Ankle Rules, the Canadian C-spine Rule, the Canadian CT Head Rules, and mini-stroke risk, which are used around the world to help emergency medicine health professionals decide when to order x-rays and CT scans. With this app, the world-famous Ottawa Rules developed by Dr. Ian Stiell, an Ottawa Hospital emergency physician, and his emergency medicine research group, will be more accessible to the new generation of wired emergency department clinicians.

OKKIDNEY

OkKidney is a phosphate management tool for patients with chronic

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Clothing our patients in dignity

Some might take a new pair of pants for granted, but St. Michael's Family Health Team has found that patients who've received brand new items from the team's Patient Comfort Closet are grateful for the comfort and dignity they provide.

"We've created a closet stocked with everyday essentials that our providers can pull from to offer patients in need," says Cian Knights, the community engagement specialist with the Family Health Team and creator of the closet. "That need can be new shoes for someone who is vulnerably housed, to a stroller for a new parent who cannot afford one."

The Patient Comfort Closet is restocked every two months through a partnership with Brands for Canada, a not-for-profit organization working to ensure Canadians living below the poverty line have access to proper clothing and other basic essentials necessary. Everyday items such as new clothing, toothbrushes and toothpaste, deodorant, incontinence products and cleaning supplies can come in the delivery truck.

"It's like a closet of mystery," says Knights. "We never know what we'll get each shipment, but the items are always new and that's important. It's dignifying for our patients to have new items. That's why we don't accept or offer gently used or second-hand items."

Any healthcare practitioner with the Family Health Team can access the Patient Comfort Closet to get items patients need.

"The closet has brought instant comfort to our patients," says John Giannitsopoulos, a social worker. "It allows us to address an immediate concern while we continue supporting our patients' health and well-being over the long-term through social and economic solutions."

Since it was piloted in January at the Sumac Creek Health Centre, the closet has been used more than 50 times to help patients meet their basic living needs. The closet has also expanded to the St. James Health Centre and the Health Centre at 410 Sherbourne. The latter two sites were able to build their own closet through the Dr. Philip Berger Health Advocacy Fund – a fund set up by grateful donors to support needs within the Family Health Team. H

Skaidra Puodziunas works in communications at St. Michael's Hospital.

The Family Health Team's John Giannitsopoulos, social worker, and Cian Knights, community engagement specialist, sort stock in the Patient Comfort Closet at the Sumac Creek Family Health Centre. (Photo by Yuri Markarov, Medical Media Centre)

mHealth

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kidney disease treated with peritoneal dialysis. The app allows patients to track their daily dietary intake of phosphate and recommends an appropriate dose of calcium binders to accompany each meal. OkKidney is being formally evaluated in a randomized controlled trial before being released to the public.

PROJECT BIG LIFE

Project Big Life is an online collection of health calculators that allow people and healthcare providers to estimate life expectancy based on diet, physical activity, and lifestyle habits, such as salt intake, smoking habits, alcohol consumption and more. The project was developed by Dr. Douglas Manuel and his team at The Ottawa Hospital using surveys from Statistics Canada that are linked to healthcare records. The free life-expectancy calculator has been used by more than one million people worldwide. H

Season Osborne is Publications Officer at The Ottawa Hospital Foundation.

Integrating hospital with community to address the opioid crisis

By Mike Lapaine

Ontario is in the midst of an opioid crisis and with every report and media article released, the severity of the problem becomes more apparent. In hospitals, the crisis can be seen on the faces of the people who come to us for care and support for themselves or their loved ones. The physical and social damage that individuals struggling with addictions and their families face is, quite simply, devastating and is most certainly the weak link in our healthcare system.

WE NEED TO RE-EXAMINE THE WAY "WE HAVE ALWAYS DONE THINGS

Adding more complexity, once you peel back the layers of addiction you can find any number of mental health issues which have been both dulled and exacerbated through the use of opioids and other harmful substances. Addictions and Mental Health are inextricably linked. Often, people with addictions present in the Emergency Departments across Canada or are admitted to hospital for acute care treatment for issues related to poor nutrition, falls, cardiac or stroke.

It would be a gross understatement to say that there are no simple solutions. What we can be sure of is that the opioid crisis cannot effectively be addressed by one sector of the healthcare system or even the healthcare sector on its own. As leaders in healthcare, we need to step outside of our hospital walls and indeed outside our sector to look for new ways to work with partners to ensure that our communities have the best care possible, well before, most certainly during and long after their acute care need.

Eighteen months ago, in recognition that mental health and addictions experiences are not limited to acute care, Bluewater Health fundamentally changed our mental health and addictions model. Together with the Canadian Mental Health Association Lambton Kent Branch we created a joint leadership position, accountable to both organizations. Effectively, the Integrated Vice President represents the connectivity between community and hospital. The Integrated Vice-President, Mental Health & Addictions Services is a member of the Executive Council for both organizations; she has a unique opportunity to educate and inform senior leaders about mental health and addictions and participate in policy development and strategic decisions. For Bluewater Health, this has served as a starting point to embed the mental health and addictions lens into every patient population cared for in the hospital setting.

Through this experience, we have learned that we need to re-examine the way "we have always done things." Specific to the opioid crisis, we recently implemented Emergency Department (ED) Opioid Prescribing Guidelines. This included significant consultation with primary care partners, as well as stakeholders inside and outside of our walls. Key to this program is the compassionate approach to people who are presenting in the ED for opioid prescriptions, communication with primary care and in the event a patient does not have a primary care provider, referral to a primary care physician who has agreed to see the patient within three days.

Leaders in mental health and addictions – both locally and further afield – are able to implement advancements in mental health and addiction care at every stage of the patient journey with the strength of our collected wisdom and commitment. From prevention to early intervention to harm reduction to abstinence, with our partners we are part of a collective effort to become greater than the sum of our parts.

Mike Lapaine is President & CEO, Bluewater Health.

With this model in place, we are beginning to realize improvements for patients, for instance typical withdrawal management wait times have fallen from 19 days in April of 2014 to less than one day currently. Work is well underway for a residential treatment facility and true to our integrated model, our partners have been involved every step of the way during the initial phases of this project. Proposed services for our Withdrawal Management Program will include residential program beds, stabilization beds, continuing with existing community withdrawal management services, day treatment and referral services and with addictions counseling services. The goal is for this hub to be easily-accessible and community-based.

In order for a successful recovery from addictions to occur, community partners providing fundamental services such as primary care, housing, income and employment opportunities, will continue to be critical contributors to this collaborative model of service delivery to address the multiple needs of those with addictions, through an integrated model of care. Their insight will assist us in guiding the plan through a public health approach to address not only healthcare, but social welfare and education.

Moving forward, we know that there will be more opportunities to make improvements, push ourselves further and take risks, but we have the model in place and solid working relationships with our community partners. At Bluewater Health, we are a conduit to getting people the care they need, inside the hospital and out. As one organization, we cannot solve the addictions crisis in our community but with our partners, we are able to create of system of shared care that optimize existing resources and collectively plan and execute new services that may still be missing to complete this model, and increase the success rates for our clients and families who experience the devastating effects of addictions. H

Mike Lapaine is President and CEO, Bluewater Health.

Giving patients and families a voice

By Carla Wintersgill

For some patients, undertaking a stay at a hospital can be an overwhelming experience. Often, patients are unsure where to turn to express their comments or concerns about their care.

With its new patient and family engagement committees, Runnymede Healthcare Centre is enhancing the patient experience by providing a forum for patients and families to actively engage in their healthcare by voicing their feedback.

In continued support of Runnymede's commitment to putting patients first, the floor-based committees are designed to augment the quality of care the hospital provides. These committees are a forum for patients, families, and management to initiate quality and safety improvement discussions with a shared goal of making floor-based enhancements in a timely manner.

"Everything goes back to putting patients at the centre of their care," says Victoria Forrest, Patient Care Coordinator. "We want to make sure they are included in everything."

Held monthly, each meeting begins with a review of the previous meeting's minutes and a discussion of how the concerns have been met. Agenda items are set with input from patients, families, and clinical staff.

Attendance for the meetings has been growing steadily since their introduction in May 2017. The patient care manager chairs the meetings, which are also attended by the patient care coordinator, social worker, clinical educator, and advance practice nurses. Families are invited to participate because they often speak on behalf of patients.

The committees provide the benefit of fostering two-way communication and collaboration between the hospital and patients. Patients are able to share the issues they would like addressed, while the hospital keeps patients informed about ongoing improvements and can solicit feedback on resources and policies.

"The patient and family engagement committees provide a mechanism for patients and families to gain a better understanding of patient care delivery," says Runnymede's Vice President of Strategy, Quality and Clinical Programs, Sharleen Ahmed. "They also provide a structured vehicle to communicate quality and safety issues and improvement strategies for the hospital."

Many patient suggestions are quickly implemented once they are brought to the hospital's attention.

After family members expressed confusion about a staffing procedure, the nursing education manager was brought into the following meeting to explain the process.

One patient didn't know where to turn with his request to have ice cream for dessert. After he put it forward at a meeting, the patient care coordinator spoke with the dietician, who signed off on ice cream for the patient.

Other small improvements have enhanced the patient experience for an entire floor, such as replacing the old coffee mugs.

The patient and family engagement committees are one more way Runnymede places patients at the centre of their own care and decision-making.

"Before these committees, patients didn't know where to go with these concerns," says Forrest. "Now they have a voice." H

Patient and family engagement committees provide the benefit of fostering two-way communication and collaboration between the hospital and patients.

Carla Wintersgill is a Communications Specialist at Runnymede Healthcare Centre.

How new tech fights HAIs

By Kasia Kaluzny

Each year in Canada, more than 200,000 patients catch a hospital-acquired infection, and 8,000 patients die as a result. Hospital-acquired infections, also called "nosocomial infections" or "healthcare-associated infections" (HAIs), are caused by germs such as bacteria, viruses, and fungi. These infections not only endanger the lives of patients, but they also burden healthcare facilities by increasing costs due to longer hospital stays, more diagnostic tests, more treatments, and isolation precautions. Proper cleaning and infection-control practices have come a long way in curbing this problem, but they require adequate time and resources. Now, new disinfection technologies are being developed that could help. CADTH recently took a look at some of them as part of its Horizon Scanning program:

BLUE-VIOLET LIGHT TO DISINFECT ROOMS

A new ceiling light called Indigo-Clean gives off a blue-violet light at a wavelength that kills bacteria. The light fixture comes in various sizes and light intensities so that it can be used in different hospital spaces, including patient rooms, waiting rooms, bathrooms, and surgical suites. The lights have two modes: the first, "white disinfection," is used while the room is occupied and provides ambient light, and the second, "indigo disinfection," provides more disinfection power without the ambient light. It is safe for staff and patients to be in the room during both modes, but studies on comfort levels for the blue-violet light are underway. Although more research is needed to see if the lights actually reduce hospital-acquired infections, several studies show that the lights do reduce bacterial levels on surfaces, with greater reductions seen the longer the lights are used. One issue to consider is that decontamination with blue-violet light can take several hours, whereas it takes minutes with ultraviolet-C (UV-C) light. A quicker decontamination has the advantage of making rooms available for patients sooner. On the other hand, blue-violet light does not damage rubber or plastic, which UV-C light can do over time.

KILLING GERMS WITH UV-C LIGHT

A new technology using UV-C light is the LightStrike PX-UV system, a portable device that can be set up in a hospital room after cleaning. It blasts the space with UV-C light for about five minutes at each location in the room (it has to be placed at different locations for full coverage). Several studies have shown that the LightStrike system is effective. There were 10 studies that examined its ability to reduce infections, with most showing promising results. The LightStrike system reduced the number of infections caused by Clostridium difficile, methicillin-resistant Staphylococcus aureus (MRSA), and vancomycin-resistant enterococci (VRE), some of the most problematic bacteria in hospitals. However, it's difficult to know the true effect of the LightStrike system because other infection-prevention programs, such as hand washing audits, were often started around the same time the system was introduced.

SHINING A LIGHT ON MOBILE DEVICES

Mobile devices, such as smartphones and tablets, are widely used in hospitals, but they can be covered in germs. A new disinfection machine already in use at three Canadian hospitals is the CleanSlate UV Sanitizer. This countertop machine uses UV-C light to destroy microorganisms on mobile devices. Healthcare workers, patients, and visitors can place their mobile device in the CleanSlate UV Sanitizer, close the lid, and wash their hands while their device is irradiated with UV-C light. After a disinfection cycle of 30 seconds, the lid opens automatically, and the mobile device is ready to be removed and used. Laboratory testing using a prototype found that the CleanSlate UV Sanitizer killed 99 per cent of methicillin-resistant Staphylococcus aureus bacteria and C. difficile spores on pre-cleaned surfaces. More research is needed to see if using the CleanSlate UV Sanitizer will actually reduce hospital-acquired infections.

A SALTY SOLUTION?

Another way to reduce the spread of bacteria is to inhibit their ability to grow on frequently touched surfaces such as doorknobs, bed rails, toilet handles, and taps. A Canadian company called Outbreaker Solutions has started making coatings for these items out of 99 per cent compressed salt, which is known to have antimicrobial properties. The inventor of Outbreaker products was familiar with the ability of salt to slow bacterial growth from his work in the meat industry, and he partnered with University of Alberta researchers to bring this solution to the health care setting. Pilot evaluations of Outbreaker products are underway at several Alberta facilities, and the company expects to launch its first products in Canada in late 2017.

SHARK ATTACK

It may seem unlikely, but sharks are influencing how infections are prevented in hospitals. A micropatterned surface that mimics the natural texture and pattern of shark skin has been developed to interfere with the ability of bacteria to stick to its surface. Called Sharklet, it was discovered through research for the US Office of Naval Research and has been used for many years to prevent marine organisms attaching to submarines and ships. Now it's been applied to the healthcare setting, with the hopes of reducing bacterial contamination. Laboratory studies

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New patient experience

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THE VALUE

While patient surveys are not new to the healthcare system, this is the first standardized tool aimed at reporting comparable patient experience data in multiple jurisdictions across the country.

A participating facility can now see where patients felt they were treated with courtesy and respect by staff, or how well their care providers explained patients' treatments to them before a procedure or leaving hospital. This first-hand information allows hospital and health system leaders to identify issues related to healthcare delivery, and strategically target efforts to inform quality improvement and the provision of patient-centred care.

Hospitals can benefit from peer-to-peer learning and best practice sharing through comparisons and benchmarking at the national level. Comparing their own results with that of their peers can help inform the benchmarks they want to hit, as they strive for the best care possible.

"Implementing the CPES-IC in Manitoba has been integral in supporting quality improvement throughout the province," says Della Beattie, Senior Policy Analyst at Manitoba Health, Seniors and Active Living. "Working with CIHI has enabled us to undertake this work with confidence that it is being done to a level of rigor we could not have accomplished on our own. We look forward to being able to share results more easily, as well as being able to make more cross-Canada comparisons as more data becomes available."

THE FUTURE

Building on CIHI's reporting and analytics on the health system, CIHI will be expanding its work in patient reported data.

Efforts are underway to support jurisdictions in the use of CPES-IC results to drive quality improvement initiatives at the local level. CIHI is also working with stakeholders to determine how best to further expand our patient reported data program of work in other health care sectors, including the development of patient-reported outcome measures.

Facilities interested in implementing the CPES-IC can contact CIHI's patient experience team at prems@cihi.ca.

Additional information is available at www.cihi.ca/prems. H

Evidence matters

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show promising results, with reduced bacterial adhesion and growth on medical equipment and frequently touched surfaces covered with the Sharklet material. Studies are also underway to investigate Sharklet's use in catheters and other medical devices. More research is needed to see how the material will affect rates of hospital-acquired infections.

These are just some of the many new technologies being developed to fight hospital-acquired infections. The Canadian Standards Association (CSA Group) has published a document to help with the evaluation of new materials and technologies for infection prevention and control. It provides several checklists to help with decision-making and explains the limitations that exist in current research.

For more information about the technologies covered here, read our latest Health Technology Update newsletter: cadth.ca/dv/health-technology-update-issue-19.

If you would like to learn more about CADTH, visit cadth.ca, follow us on Twitter @CADTH_ACMTS, or speak to a Liaison Officer in your region: cadth.ca/Liaison-Officers. To suggest a new or emerging health technology for CADTH to review, email us at HorizonScanning@cadth.ca. H

Kasia Kaluzny is a Knowledge Mobilization Officer at CADTH and has a Master of Science degree in Microbiology.

Cover: Collective wisdom

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One of my earlier posts, which included an image upload of bloodwork, concerned a previously healthy 43-year-old male with confusion and vomiting recently arrived to Canada from Jamaica. It prompted a lively discussion. Most physicians favored pursuing a possible hematological malignancy, such as ALL or CLL. But with the help of a physician offering valuable – and ultimately accurate – context regarding the etiology, we tested for a retrovirus. The helpful physician happened to be from the Caribbean, where HTLV1 prevalence is high.

Real-life doctors

Physicians may hate to admit it, but the isolation of medical practice can take a quiet toll. Even in a group practice, the tempo of the work day leaves little time for curbsides. We are sequestered in our offices, regardless of setting. For me, crowdsourcing has mitigated that isolation, and cultivated a friendly professional community.

There is a remarkable heterogeneity in posting, and a range of personalities. Some physicians hew to their training and find it difficult to admit what they don't know. Others are surprisingly honest, arriving to Consult with a "what the heck is this?" honesty. Sometimes the answers elude most of us, and sometimes the solution comes from a far reaching place, where what is rare for you is not for someone else. The contact may be virtual, but we get to know each other.

And, returning to some recent cases, the range and depth are as diverse as the crowdsourcing medical community itself. For example, the suggestions regarding the palate lesion ranged from possible primary syphilis to HPV squamous cell carcinoma or a salivary gland tumor (which it was). The majority of physicians thought the non-vesicular rash was Sweet's Syndrome, but virtually all recommended a biopsy (which found bulbous vasculitis), and the young man with superficial neck veins? A bit of a head-scratcher, with colleagues volunteering it was a possible symptom of leukemia, or a contusion from choking games or autoerotic asphyxiation. The poster returned to say that in fact it was dye from the patient's clothing that had rubbed off. You could hear the collective "well, what do you know?" from the community and a few commenters noting they would remember the discussion and, if presented with a similar symptom, rule out the clothing dye first. H


nursesknow.ona.org
Better care starts here.
As thousands of patients know, it can be very hard to access home care in Ontario. Patients want to stay in their homes. But that's possible only if skilled nurses are supporting their independence and providing the specialized care that takes the pressure off family members. There are solutions.
Nurses know.
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Ontario Nurses' Association