

BUILDING A SUCCESSFUL MEDTECH INFRASTRUCTURE

2019 Waterloo MedTech Conference

Wednesday, October 2, 2019

#WaterlooMedTech
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Hosted and Organized by:



2019 WATERLOO MEDTECH CONFERENCE

Waterloo MedTech, the host of the 2019 conference on Wednesday, October 2, called on the community to unite now to develop a supportive infrastructure for medtech innovation and start-ups.



Waterloo MedTech Innovation Infrastructure



Shirley Fenton and Doug Dittmer, MD
Co-chairs,
Waterloo MedTech Conference

"We look forward to discussing the conference outcomes further with key players within the community and can't wait for next year's conference to provide a progress update on the MedTech infrastructure within Waterloo Region."

Building a medtech innovation infrastructure

The 2018 conference closed with a call to action and a sentiment that we need the will to make medtech innovation happen. A year later, there is a groundswell to advance this innovation agenda particularly in community-based health care. The presence of leadership teams from local government, hospitals and academic institutions at the conference this year shows a commitment to see a medtech innovation hub established in conjunction with the local healthcare environment. The conference began with an exploration of other centres that have demonstrated how they connect innovators and entrepreneurs with doctors, nurses and therapists as their path to healthcare innovation.

Waterloo MedTech seeks to build a medtech innovation infrastructure initially in the local healthcare environment with eventual expansion to

multiple sites. The fundamental blueprint could apply to any community seeking to stimulate a collaborative culture of health innovation. It has the potential to enable health start-ups to drive medtech innovation and benefit patient outcomes in Canadian society and beyond. The Waterloo MedTech innovation infrastructure is complementary to the region's incubators and accelerators, including Communitech, The Accelerator Centre, University of Waterloo's Velocity, LaunchPad and the recently launched Medical Innovation Xchange (MIX).

OPENING REMARKS



Karen Redman
Regional Chair,
Waterloo Region

"The biggest challenge facing our community is healthcare and how it's delivered. There's such fertile ground for innovation now. This organization is leading in a very significant way. Bringing entrepreneurs and start-ups, researchers, industry and government experts together with leaders and healthcare professionals is the kind of collaboration and consultation that actually is the hallmark of Waterloo Region. We have a reputation for supporting start-ups and scale-ups. On behalf of the 600,000 people who live in Waterloo Region, thank you for staying, living, and making sure the quality of life is better not only in Waterloo Region but across Canada and throughout the world."

PUNCHING ABOVE ITS WEIGHT

Dr. Doug Dittmer opened the conference by stating that we want to find a solution. He noted that in the last three years, we had heard from the community players about the problems of building the medtech ecosystem.

"So, here's your chance. We have some of the top minds in science in Canada and the United States and some of the top business school minds in the country here. We have a chance today to make this happen. Like the Nike commercial; let's do it."

Doug Dittmer, MD,
Physical Medicine and
Rehabilitation Physician

Chair Redman's comments were reinforced by the Honourable Bardish Chagger, who said that when it comes to medtech, it's not always in the spotlight; this community uses tech for good

to embrace technology, which is needed to help solve health problems more than ever. The medtech sector in Ontario employs about 23,000 people in 1,300 companies that earn about \$12 billion in revenue annually and export about \$1.5 billion annually. They include technologies in medical imaging, wireless and mobile health, wearables and medical devices. This community has continually punched above its weight class in areas such as tech and digital media, and advanced manufacturing.

"And I think that's really important to underscore that Waterloo Region isn't the biggest area in Canada, but we punch way above our weight. We're now responsible for about 17 percent of the GDP. In Canada on the global stage, [we] may not be a giant, but we punch way above our weight. I think it's that can-do attitude," described Chair Redman.

BLUEPRINTS - STEAL WITH PRIDE

This fourth annual Waterloo Medtech conference could be a watershed, a defining moment for Waterloo Region as we build upon the successes and lessons from other medtech infrastructure projects in Toronto, Montreal, Boston, Baltimore and beyond.

"We definitely have to think Toronto-Waterloo as a region," noted Tiff Macklem, PhD, Dean of the Rotman School of Management.

"The discussions from today highlighted that there is no single model for medtech innovation. We heard today from clinicians, researchers, and innovators about models that were custom-designed for specific ecosystems. This year's conference shows examples of successful medtech innovations locally (e.g. Biomedical Zone), within Canada (MEDTEQ) and from the USA (MIT & Johns Hopkins)," commented the morning's chair and moderator,



"It's very important in entrepreneurship or any other activities as well to distinguish between aspirations and goals. Often our aspiration is to start a new company to spin something out from our technology and our laboratory. But our goal is to see that company grow and deliver value for our customers, to society, and most importantly medtech to have impact for the patient."

Charles Cooney
Professor Emeritus, Chemical and Biochemical Engineering,
Founding Faculty Director,
Emeritus, Deshpande Center for
Technological Innovation,
MIT

Chekema Prince, PhD. "Several components of the health innovation models discussed during today's conference are present right here in Waterloo Region. The region needs to take its medtech ingredients and make their recipe for success."

The day's conference brought together healthcare, research, industry, and government, including healthcare stakeholders, start-ups, scientists, industry experts, government officials, innovators and thought leaders. Through the morning, the 160 attendees heard from those with experience in building health innovation clusters elsewhere, while the afternoon heard from business and entrepreneur experts about success factors in building medtech infrastructure.

MIT Professor Emeritus Charles Cooney, PhD, doesn't like the word entrepreneurship, which he perceives as static. "I prefer entreprenuring, which is active," he states. It is vital to building an ecosystem so that you don't fall far, he adds, expanding on his analogy with his other passion, climbing.

"One of the worst things you can do is write a business plan. At MIT, they teach students to translate these business ideas into a go-to-market strategy. MIT is successful in taking innovation to the marketplace, and like Waterloo, it does not have a medical school."

Cooney provided particularly noteworthy guidance in two areas: the principle of translating research into commercial impact and the changing paradigm in technology-based venture creation.

The Principle in Translating Academic research Into Commercial Impact

- Ideas emerge from a platform of basic science – "Scientific Knowledge".
- Ideas need to be recognized as solutions to problems – "Market Knowledge".
- BOTH funding and mentoring are needed to support "Translational Research" – Clarity of your goal.
- The "Internal Ecosystem" stimulates and rewards innovation behaviour, nurturing teams and crossing boundaries.
- The "External Ecosystem" supports, nurtures and absorbs innovative ideas.
- "Entrepreneurs" to take the ideas and execute on a vision.

The Changing Paradigm in Technology-Based Venture Creation

- The opportunistic model of venture investing is giving way to a purpose-led model in creating companies that exploit new science and technology to solve important societal problems.
- Create teams around disruptive ideas rather than waiting for ideas to appear at the door.
- Harness our investment research, converging science across disciplinary boundaries and addressing innovative solutions to societal problems.
- Undertake venture building by de-risking ideas, defining platforms and proof-of-concept to prepare them for investment.

Another medtech model was described by Paul Nagy, Deputy Director, Johns Hopkins Medicine Technology Centre.

Johns Hopkins Hospital is one of the United States' top teaching hospitals, and where the Medicine Technology Centre is embedded in the hospital.

Nagy offered these key points that summarize his core recommendations.

"There's a lot of IT innovation, and there's a lot of opportunity for us to move forward in digital health. I think we're starting to see the internet generation really begin to take off, and I think it's going to transform medicine, stated Paul Nagy, PhD, Deputy Director, Johns Hopkins Medicine Technology Center. "We're able to use smart devices and do a lot of the diagnostics in the hospital off wearables and from these smartphones to connect to our care providers. And so that's going to create a lot of disruption, a lot of opportunity for improving care, and efficiency and I think we're going to see a lot of economic development as we try to really improve healthcare with this new technology."

Paul Nagy,
Deputy Director,
Johns Hopkins Medicine
Technology Center

Building an Ecosystem for Innovation

1. Innovation Centre: A hub to bring together entrepreneurs with clinical leaders
2. Build organizational capacity within health systems to lead change
3. Enable these teams with data and analytics

An innovation centre can guide idea practitioners to create value across organizational boundaries

- Training programs to organize data, gain insights from data, and build interdisciplinary teams to create value
- Use design thinking to understand problems and solutions
- Embrace the latest technologies (Data Science, IoT, Voice, ReST)
- Empower the front line with an entrepreneurial culture

He also cited the book *Voices of Innovation - Fulfilling the Promise of Information Technology in Healthcare* by Edward W. Marx.

A CULTURE FOR INNOVATION

The afternoon panel, moderated by two medtech experts, Josephine McMurray, PhD, and Zach Weston, both faculty at Wilfrid Laurier University, noted that the concentration of academic teaching hospitals in Toronto can impose some restrictions. The ability to scale requires four ingredients; specialist talent, access to problems/markets, a can-do attitude and resources. Several panellists believe that judgment is the scarcest resource. The best technology rarely gets the best business wins. The best companies are those where management insights are given attention.

"It's going to be brilliantly managed deployments of technology in the context of a system that's focused on patient outcomes and patient experience," summarizes Mark Weber, PhD, Eyton Director at the Conrad School of Entrepreneurship and Business at the University of Waterloo.

When the question about gender equity was raised, both Weber and Weston were able to point to a sea change. Two-thirds of the incoming class of biomedical engineering at the University of Waterloo are female.

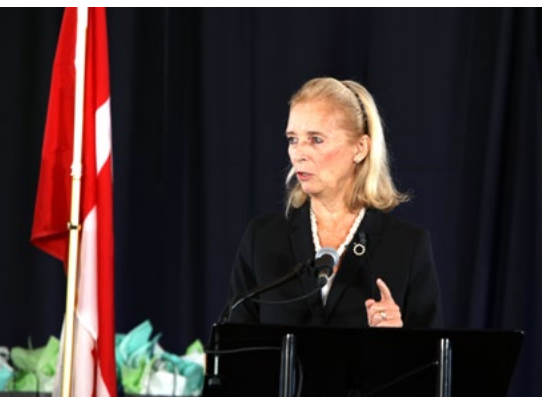


WE HAVE THE TALENT

Our talent is not leaving the region in the same way as before. The Silicon Valley monoliths are now coming to the Toronto-Waterloo corridor to hire talent, but they want the talent to remain here.

Tiff Macklem, Dean, Rotman School of Management, University of Toronto, highlighted that this creates a competitive issue and a requirement to articulate a competitive advantage both for the start-ups as well as the regional ecosystem. "Talent is the stickiest thing," he added.

Companies are coming here for the talent and build on the reputation of our academic institutions, co-op programs and world-leading medical research networks in Toronto. Gary Hallam, Executive Dean of the School of Business, Conestoga College, noted that the robust applied research mandate of the engineering, science, business school and entrepreneurship collective at Conestoga College adds to the strength in the region.



Diane Côté
President and CEO,
MEDTEQ

Côté leads MEDTEQ, a national centre of excellence that aims to accelerate healthcare innovation in Canada through collaborative, industry-led projects.

Golden Triangle Angel Network (GTAN) is a member-only organization composed of Angel Investors seeking investment opportunities in promising, early-stage businesses.

ANGEL INVESTING RISING IN PROMINENCE

The Dean of the Lazaridis School of Business, Micheál Kelly, PhD, advises start-ups to be careful about what venture capital (VC) money they take. The wrong VC can take a seat on your board or affect your IP ownership. It is noted that the depth of our venture capital market in Canada is improving, yet the angels play a crucial role. The Golden Triangle Angel Network (GTAN) "is a phenomenal opportunity for start-up companies to start raising funds," remarks Kelly.

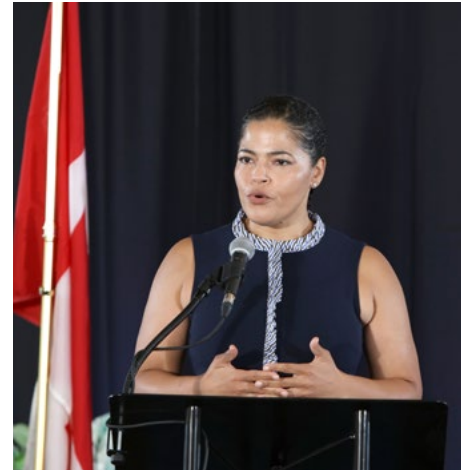
VENTURE OUT WITH OUR WATERLOO SECRET SAUCE

Dr. Dittmer rounded off the conference with his "Own the Podium" analogy from his Olympic and Paralympic medicine experience. He cited the need for a new attitude to increase Canada's below benchmark research in health care, even though it consumes close to 40% of provincial expenditure. Dr. Dittmer notes how Utah has found the secret sauce and climbed to the top tier medtech growth.

"So how do we build our yellow brick road?" He asks. "We have all the ingredients to formulate a collaborative hub."

He concluded if we in Waterloo and Canada want to own the podium in the near future, we can't wait. We need to start now.

The participation of the chief executives from the region's hospitals was a poignant sign on the desire to seek innovative local solutions to the region's health challenges.



"The moment is now for the community to strike and create something incredibly valuable. [Waterloo Region] literally has all the players to do what you need to do. I have been astounded by the opportunity that exists. I'm actually quite envious of what you've got in Waterloo!"

Linda Maxwell, MD, MBA

Executive Director and Founder,
Biomedical Zone
Associate Scientist,
St. Michael's Hospital
Distinguished Visiting Professor,
Ryerson University

MEDTECH INCUBATOR EXEMPLARS

The examples and experiences from centres in North America can provide a blueprint for new medtech innovation hubs. The breadth of models demonstrated that there is no single viable model. Each has its advantages and limitations.

Biomedical Zone shows that collaboration between an academic institution and a healthcare organization can be a very successful approach to building a medtech incubator. Biomedical Zone is Canada's first and only, hospital-embedded, physician-led business incubator for emerging health technology companies. Since its founding in 2015, the Biomedical Zone has developed over 35 start-up companies, raised over \$35 million in venture capital, over \$3 million in non-dilutive grants and research collaborations, and has had two commercial exits. The Biomedical Zone and its start-ups have engaged over 100 clinicians and have impacted over 65,000 patients.

MEDTEQ, the Medical Technology Industrial Research and Innovation Consortium established in 2013 in Quebec, shows that a public-private partnership can pioneer medtech innovation. MEDTEQ's successes led it to be named a Centre of Excellence in Commercialization and Research (CECR) in 2018 to support collaborative projects of teams of industrial, academic and clinical partners. One of its programs, Beachheads, is a partnership between a center of clinical excellence and companies to accelerate the adoption of value-based innovations.

MIT shows that successful health innovation can develop in and be commercialized from an academic engineering-based centre, the Deshpande Centre, through the awarding of research grants and provision of assistance to researchers. Grantees are coached and mentored on how

to commercialize their inventions and launch start-up companies. Although MIT has no medical school, the Deshpande Centre has been successful in taking innovations from the lab to the market.

Johns Hopkins Medicine Technology Innovation Center shows that health innovation embedded in a prestigious medical school can be a successful pathway from innovation to commercialization. The medical innovation centre brings researchers and healthcare providers together to create digital healthcare solutions. Scientists and clinicians can work together with software specialists to develop creative solutions. This unique blend of designers, software engineers, data specialists and clinicians has proven to be successful in taking ideas to commercialization.

PIONEERS

Through the conference, attendees heard about these pioneering centres. They are summarized below for ease of reference in alongside.

[Creative Destruction Lab \(CDL\)](#) is a seed-stage program for massively scalable, science-based companies. Rotman School of Management, Toronto as well as Calgary, Halifax, Montreal, Vancouver and Oxford.

[Medical Innovation Xchange \(MIX\)](#) provides a collaborative space for local medtech companies in such a way that supports their individual growth and adds to the overall success of the ecosystem. Kitchener.

[Biomedical Zone](#) is Canada's leading incubator for medical start-ups; it helps early-stage health technology companies validate their need-based solutions directly in the hospital setting. Toronto.

[Hexcite \(Excited for Healthcare\)](#) is an early-stage medical software accelerator program for entrepreneurs hosted by the Johns Hopkins Medicine Technology Innovation Center in collaboration with Johns Hopkins Technology Ventures. Baltimore.

[Y-Combinator](#) provides seed funding for start-ups to get them through the first phase. Silicon Valley.

TOP INNOVATORS & START-UPS SHOWCASE 2019



Start-ups from Velocity, Communitech and The Accelerator Centre were selected as the top entrepreneurs for 2019 to participate in a showcase at the conference. Each was presented with a 2019 Top Start-Up Award. (L to R): Aaron Rosenblum, Francois Gand, Rob Koch, Sabrina Adair, Yann Gagnon, Alexander J. Lausch

AHead Simulations Inc.

Presented by: Rob Koch, Founder and President

Ahead Simulations is a company that provides improved hearing health care through advanced simulators. Rob received the Governor General's Gold Medal for the development and validation of the initial simulator. AHead's first product, CARL, is a manikin-based patient simulator designed to simulate a hearing-loss patient accurately. In training scenarios, CARL provides a tool for new clinicians to practice their procedures and become confident before affecting the care of patients. In research settings, CARL simulates participants and represents an average patient for patient-studies and product development. In a clinical scenario, CARL allows for the demonstration of the hearing aid selection and fitting process to patients. With CARL now having the ability to hear, you will soon be able to hear what CARL is hearing and experience hearing aids in a low-pressure environment before committing to buy.

ClearVoxel Imaging Inc.

Presented by: Yann Gagnon, Founder and CEO

ClearVoxel Imaging was founded in 2017. It is building an intelligent user interface that will allow radiologists to diagnose faster, more accurately and with fewer clicks. Most errors in medical imaging are due to inconsistent visual perception. Using AI and eye-tracking, their technology learns and monitors the visual search patterns of radiologists as they review medical images and gives them visual feedback when they are most at risk of missing a diagnosis.

Cohesys Inc.

Presented by: Alexander J. Lausch, PhD, Co-founder

Cohesys Inc. is creating superior, next-generation surgical adhesives. Craniomaxillofacial fractures are prevalent, arising from physical trauma such as motor vehicle collisions and falls. They often require surgical reduction and stabilization to restore bone alignment to ensure proper fracture healing. Titanium plates, the current standard of care, are over-engineered and difficult to use. Installation involves manually shaping rigid plates to match the bone's profile, drilling into healthy bone, and inserting screws into bone that is sometimes only millimetres thick. Complications requiring plate removal such as discomfort/pain, exposure, and infection, occur in as many as 50% of procedures. Cohesys is developing a surgical tape called BoneTape, for fracture stabilization in mid-facial fractures. BoneTape is a flexible, biodegradable tape composed of a polymeric backing coated with a layer of newly developed bio-adhesive, designed to adhere in physiological conditions. This system aims to decrease surgical time, increase ease of use, and reduce revision rates of the current standard of care.

Enabling Adaptations Inc.

Presented by: Sabrina Adair, Founder & CEO

Enabling Adaptations is a pediatric therapy consultation platform where parents or caregivers can reach out to chat with a pediatric professional. Her vision for Enabling Adaptations, drawn from her years of building strong support systems for children, is to put access to therapists and resources in the hands of parents to empower parents to help their children now, while they wait for the education and healthcare systems to catch up.

NURO Corporation

Presented by: Francois Gand, Founder & CEO

NURO is a Waterloo-based, award-winning start-up specializing in Neuroscience and Neurotechnology. After a sudden traumatic accident, Francois redirected his 25-year career in enterprise technology towards neuroscience. He founded NURO to address limitations in assistive technology with profoundly incapacitated patients. With his two other co-founders, Abhinav Kumar and Pascal Gand, Francois architected NUOS, the Neural Operating System, allowing patients today to communicate and compute using live neurological signals without surgery. Their first product, NUOS, the Neural Operating System, provides to incapacitated touchless and voiceless users a novel, non-invasive, training-less and calibration-less instant neurological communication tool and computing platform when traditional technologies are no longer an option. NUOS is Health Canada cleared and is currently in clinical trials in the United States.

Stabilo Medical Inc.

Presented by: Aaron Rosenblum, Co-founder

Stabilo Medical has the vision to improve the rate and levels of recovery for rehabilitation patients across the world through the use of wearable technology. They are currently developing a smart vest to improve patient outcomes in stroke rehabilitation. Stroke is one of the leading causes of disability worldwide and is becoming more prominent due to an aging demographic. A pivotal element to stroke rehabilitation is repetitive exercise, which is required to rebuild damaged connections between the brain and body. The smart vest provides stroke patients with a way to safely exercise independently, to complement the limited time spent with their therapy team. This product focuses on core recovery and building trunk control, which is fundamental to all mobility. The use of their device has the potential to reduce the likelihood of disability by enabling patients to engage in more exercise when they need it most.

2019 MEDTECH AWARDS

Start-Up to Scale-Up Award of Excellence– CloudDX

CloudDX was the recipient of the 2019 Start-Up to Scale-Up Award of Excellence. The committee recognized its development as a medtech company founded just five years ago in 2014 with its world-changing device. It was the only Canadian company that made the finals of the Qualcomm \$100-million competition to create a tricorder device, as seen on Star Trek, to collect vital signs and other health data. Since that time, it has received numerous awards, achieved regulatory clearances and obtained significant financial funding to grow its company. It has built an excellent management team and is supported by an impressive advisory group and a list of partners.

"On behalf of the entire CloudDX team, Nick and I were honoured to be recognized by Waterloo MedTech with an award for scale-up of the year. We believe that investing in the Toronto-Waterloo corridor is important for health tech entrepreneurship, patient outcomes and the Canadian economy. It is an energizing time to be pioneering in digital health and remote patient monitoring in Ontario."

Sonny Kohli, MD,
Co-founder,
CloudDX

"We are thrilled to be honoured by Waterloo MedTech. Receiving the 2019 Award of Distinction not only validates our hard work and efforts but underscores the importance of community recognition. There are so many incredible medical technologies coming out of the Waterloo Region and this award helps us foster more collaboration with local healthcare organizations so that we can showcase our innovations as we continue to gain awareness and adoption in the Canadian market."

Steve Rankin,
President & CEO,
Client Outlook

Award of Distinction – Client Outlook

The 2019 Award of Distinction went to Client Outlook for its innovation in healthcare technology and remarkable growth as a healthcare company. Client Outlook has developed healthcare's first smart viewer. Its eUnity platform is providing a progressive alternative to traditional radiology reading to empower organizations, professionals and, most importantly, patients. Client Outlook has become the vendor of choice for many healthcare organizations around the world. Client Outlook's solution has been installed in hundreds of customer sites globally, since its founding in 2006, and it has partnered with highly respected companies. It was one of the first healthcare companies in Waterloo. Throughout its growth, the company has remained in Waterloo and supported the community.



"The Innovation Award is very much appreciated. For John and I, it recognizes our commitment and ambition we have to improve the delivery of healthcare in our community.... for the physicians, medical services, and their extensive patient population. The evolution of technologies from MedTech and integration within the healthcare environment is undoubtedly crucial to this objective. We look forward to our continued collaboration."

Cynthia Voisin,
Project Coordinator,
Medical Centre at The Boardwalk

MedTech Visionary Award – Cynthia Voisin, John Sehl, MD, & Jeff McIntyre

This special award went to the team from the Medical Centre at The Boardwalk for their vision and commitment to providing new ways to address the increasing demand for health care in the community. This team imagined several years ago, built and opened a new medical centre in 2014, the home of many doctors and other medical services amid an extensive commercial development. The building of a second state-of-the-art medical building is well underway to further meet the current and future healthcare needs of the community outside of a traditional hospital. It includes an ambulance bay for EMS access in the design. This forward-thinking and commitment of the team to our community is an inspiration to all.



SPONSORS

The Conference organizers thank the sponsors and municipalities for their financial support. The Conference could not be held without their help.



ABOUT WATERLOO MEDTECH



Waterloo MedTech seeks to build a MedTech innovation centre in The Region of Waterloo. This hub established in a healthcare environment would bring innovators and entrepreneurs close to doctors, nurses and therapists. This concept has the potential to be the essential factor to healthcare innovation, enabling health start-ups to evaluate their creations for the benefit of patients in Canadian society and beyond.

Within the Waterloo Region, there are many resources for innovators to bring their ideas to market, but within the medical and health technology areas, resources to evaluate innovations are lacking. In 2016, a team of seasoned experts came together with a mission to address the gap between healthcare research and its adoption in practice thus creating Waterloo MedTech - a not-for-profit organization to

support medtech innovators begin their journey to bring their ideas to market.

Waterloo MedTech is building a directory of healthcare companies and resources. It seeks to help healthcare innovators access the resources needed to bring their idea(s) to market successfully.

Waterloo MedTech founders and directors include: Don Cowan, Founding Chairman of the Computer Science Department at the University of Waterloo and International multi-award-winning scientist and researcher; Shirley Fenton, Vice-President of National Institutes of Health Informatics; Garry Bezruki, former CIO for the City of Waterloo; Mark Whaley, co-founder of multiple national and international start-ups; and Brian Vartian, MD, Chief of Anaesthesia at Groves Memorial Community Hospital.



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A big thank you to this year's Organizing Committee for all their hard work.

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Rebecca MacIntyre
Meredith Ovenden
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SAVE THE DATE

We invite you to join us next year for the 2020 Waterloo MedTech conference on Wednesday, November 4, 2020.

Acknowledgement. This proceedings report was produced by John Gregory, Opencity Inc., Rebecca MacIntyre, Intellijoint Surgical Inc., and Shirley Fenton, Waterloo Medtech. Photographs courtesy of Terry Scott White Photography.



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