



April 28, 2021

Board of Governors
Hamilton Future Fund
c/o City of Hamilton
71 Main St W, 1st Floor
Hamilton ON L8P 4Y5

Dear Friends:

We are extremely grateful to the Hamilton Future Fund for their leadership investment in the future of innovation and surgical care at St. Joseph's Healthcare Hamilton. The Hamilton Future Fund's contribution in 2018 to support the purchase of the MAKO Rio Orthopaedic Surgical Robot enabled St. Joe's to grow our profile as a national leader in surgical robotics and work toward our vision to further develop the surgical orthopaedic program by incorporating new technologies and a growing number of academic and industry partners.

Enclosed is a report on the impact of the Hamilton Future Fund's support at St. Joe's including a research update. Thank you for your support which is positively impacting surgical care for patients in our community and contributing to Hamilton's reputation for and commitment to innovation.

Please accept our heartfelt thanks to the trustees of the Hamilton Future Fund. Your commitment to our Hospital makes this difficult time easier. We count ourselves fortunate to have Hamilton Future Fund among our valued friends and supporters. On behalf of our patients, physicians and staff, and the broader community, thank you for playing a vital role in St. Joe's story of hope, healing and discovery.

Sincerely and with thanks,

A handwritten signature in black ink, reading "Sera Filice-Armenio".

Sera Filice-Armenio
President & CEO

Enclosure



HEALING THROUGH SURGICAL INNOVATION

The MAKO RIO Orthopaedic Surgical Robot

St. Joseph's Healthcare Foundation

An Update Report

Prepared for Hamilton Future Fund Board of Governors

May 2021



HAMILTON
FUTURE FUND
BUILDING A LEGACY

St. Joseph's
Healthcare  **Hamilton**
FOUNDATION
HOPE HEALING **DISCOVERY**

THANK YOU

Our deepest thanks to the Hamilton Future Fund for your investment in the surgical robotics program at St. Joseph's Healthcare Hamilton. Thanks to your support, St. Joseph's acquired Canada's first MAKO Rio Orthopaedic Surgical Robot, here in the "Ambitious City" of Hamilton. This state-of-the-art surgical robot is a catalyst for growth, discovery and healing at St. Joe's and we are so grateful for the opportunity to provide our community with life-altering orthopaedic care that will activate research and positively influence care for patients in our region and beyond.

With the arrival of the da Vinci Xi in September 2020, St. Joe's is the **only hospital in the Country with three surgical robots: the MAKO Rio, the Da Vinci Si and the da Vinci Xi**. Hamilton Future Fund's investment has allowed St. Joe's to nurture and grow our reputation as a national leader in surgical robotics and work toward our vision to become the Canadian hub for orthopaedic robotic surgery. This state-of-the-art technology coupled with the opportunity to conduct critical research will lead to groundbreaking results, creating a permanent legacy for Hamiltonians to enjoy economic prosperity and an improved quality of life.

The MAKO Rio Surgical Robot arrived at St. Joseph's on September 27, 2018, and since then we have been pleased to publicly announce and unveil the MAKO technology with you on November 22, 2018 and perform the first surgery with this specialized technology on January 21, 2019.

Today we are pleased to provide you with an update report on the impact of the Hamilton Future Fund's support at St. Joseph's Healthcare Hamilton and Foundation including a research update. Thank you for entrusting us with your investment to grow Hamilton's reputation in healthcare innovation and discovery.



Your Investment at Work

First Robotic Knee Replacement Surgery

As you know, on January 21, 2019, Dr. Adili and his team completed the first solo partial knee replacement surgery on patient Mr. Peter Sporta. We are pleased to update you on the quick patient recovery made possible thanks to the MAKO Rio surgical robotic system's minimally-invasive technology and the skilled expertise of Chief of Surgery and Orthopaedic Surgeon, Dr. Anthony Adili.



Six weeks after the surgery, Dr. Adili followed up with his patient for a post-operative consultation and assessment. On the day of the assessment, Mr. Sporta took agile, confident strides that led into the fracture clinic exam room. The 66-year-old Oakville resident showed no signs of having a partial knee replacement only 32 days earlier. According to Mr. Sporta, ***“Within three days of Dr. Adili performing my partial knee replacement using the MAKO Rio Surgical Robot, I***

literally threw away my crutches and cane. I didn’t even need them.” The MAKO technology allowed for precision accuracy by targeting specifically the least amount of bone to cut which enabled Dr. Adili and his team to do a partial – instead of full - knee replacement, leaving the functioning parts of his knee intact. To this day, Mr. Sporta remains grateful to St. Joseph’s for this expertise and precision technology which accelerated his healing and made for an overall successful patient-care journey.

On March 1, 2019, St. Joseph’s Healthcare Hamilton posted a brief time-lapse video of Mr. Sporta’s robotic surgery on the St. Joe’s YouTube channel:

https://www.youtube.com/watch?v=kgw4ll2wKmo&feature=emb_logo

Innovative Technology and Clinical Outcomes

Traditional (non-robotic) partial knee replacements fail at a high rate due to poor alignment. For this reason, it is more common for a patient needing only part of their knee replaced to have a full knee replacement to achieve a better, long-term outcome. However, robotic Surgery with the MAKO Rio surgical robotic system now allows us to do a partial replacement with near exact alignment. The precision of the robotic arm, as guided by the surgeon, is a game changer for patients. The significant advantage it provides happens in two stages: first in preparation, it allows the surgeon to plan the exact location and measurements of the knee implant on a computer screen in 3D visuals. The second advantage is in the execution The MAKO Rio surgical robotic system prevents the surgeon from unintentionally cutting beyond the parameters created in the plan, significantly enhancing the precision of the surgery. By leaving as much of the patient's anatomy untouched, patients will have a more 'normal' feeling knee, and experience improved outcomes and better range of motion.

Clinical outcomes, including surgical volumes, success of surgery, patient satisfaction, length of recovery and resulting quality of life are tracked, reviewed, and documented.

The success of surgeries completed so far are a key indicator of the positive potential for patient care and outcomes available with this technology. **As of February 28, 2021, our surgical team has completed 53 surgeries using the MAKO Rio, including partial and full knee replacements.**

Knee Arthroplasty
Total Replacement
10

Knee Arthroplasty
Uni Replacement
26

Knee Arthroplasty
patella-femoral
replacement
17

Total MAKO Rio
Surgical Robot assisted
surgeries
53

THE NEW FRACTURE & ORTHOPAEDIC CLINIC

In February 2020, the Fracture and Orthopaedic Clinic moved to a new location on level zero of the Juravinski Innovation Tower at St. Joseph's Charlton Campus. This re-location serves a few purposes:

1. To move closer to the Diagnostic Imaging Centre, for proximity to x-rays, scans and more
2. To revitalize the Fracture & Orthopaedic Clinic space
3. To make room for our planned Psychiatric Emergency Service

The new location officially opened to patients on February 21, 2020 to serve the needs of those with orthopaedic injuries and fractures and includes services such as post-operative orthopaedic care, casting and bracing of acute fractures, treatment for injuries of the ligaments, consultations with orthopaedic surgeons, post-operative care, education and osteoporosis screenings. This busy clinic, now named the Teresa Cascioli Charitable Foundation Fracture and Orthopaedic Clinic is expected to see over 16,000 patient visits annually and shares centralized services and a bright, open waiting area with the Antonio and Maria DiCenzo Diagnostic Imaging Centre. This facility is representative of the exemplary care St. Joe's provides and enables the very best care for our orthopaedic patients, today, tomorrow, and for generations to come.

Hamilton Future Fund Plaque

We are pleased to inform you that the recognition plaque for the Hamilton Future Fund will be relocated to a prominent space within the Teresa Cascioli Charitable Foundation Fracture & Orthopaedic Clinic. Due to the ongoing COVID-19 pandemic, installation of the plaque has been delayed until we can safely welcome back external vendors. The plaque will be placed on a wall in the Fracture Clinic that is highly-visible to patients, located across from the administrative desk used for patient inquiries, booking follow-up appointments and more. We would be pleased to provide you with a tour of the new space, however, due to COVID-19, we will hold off until it is safe to attend in-person and when you will be able to view the new location of your recognition plaque.



We are pleased to continue to recognize The Hamilton Future Fund on our Garden of Grace Donor Wall, located in the Main Lobby at our Charlton Campus, in the \$500,000 - \$999,999 category.

ORTHOPAEDIC ROBOTIC SURGERY CENTRE

Hamilton is already growing as a hub of biotech and healthcare advancement. Our vision is to forge ahead into the new field of orthopaedic robotic surgery and research to transform care and offer hope to patients who suffer from debilitating joint pain and musculoskeletal injuries through the creation of an Orthopaedic Robotic Surgery Centre.

This past year all intentions were to continue to cultivate research and innovation, however, as a result of the COVID-19 pandemic, research priorities shifted to meet emerging and urgent demands. For over a year now, our healthcare heroes have been working tirelessly to combat the COVID-19 global pandemic by treating patients at our Hospital and caring for those in community settings, such as nursing homes. St. Joe's researchers have also been on the forefront for improved and accelerated testing for the COVID-19 virus. Urgent and emergency services and surgeries have continued throughout this time and for several months surgical capacity even exceeded 100 percent.

Even with the impact of the COVID-19, we are pleased to share exciting progress with the Gait Analysis Lab and research relating to orthopaedics. In the fall of 2020, the research team at the lab acquired specialized equipment, trained graduate students and in December 2020, cameras were successfully installed in the permanent gait lab within the fracture clinic. As a result, we are pleased to report the team has completed all the required testing and are ready to begin active assessment and analysis of pre- and post-surgery gait patterns to determine optimal and personalized implant surgery. Due to the recent surge in COVID, surgical capacity has once again been reduced and as a result some surgeries were delayed and/or cancelled. Ten patients are scheduled to be assessed through the gait lab as part of the RoboKnees trial. A priority for 2021 will be to significantly ramp up activity once restrictions relating to COVID have been relaxed.

Although the research team is in the beginning phase, the findings to date, have been shared with the wider medical community through medical rounds and forums. Dr. Madden presented the RoboKnees trial protocol at MacOrtho research rounds and Dr. Adili has presented on robot-assisted surgery and technological advances at the Canadian Orthopaedic Association meeting in June 2020. In addition, St. Joe's Orthopaedic research findings were shared with the OrthoEvidence community, which reaches up to 50,000 orthopaedic healthcare professionals globally. Dr. Adili was featured in a blog on robot-assisted arthroplasty describing how technological advances can be expected to improve outcomes. The interview can be located here: <https://myorthoevidence.com/Blog/Show/91>

Additional Publicity

Each year, the Research Institute of St. Joe's publishes an annual report to highlight how research at our Hospital impacts the science of medicine and how it benefits the lives of patients in our community, across Canada and around the world. We are pleased to share that the gait lab research team is featured in the article titled, "RoboKnees: Using motion capture technology to optimize partial knee arthroplasty". The link to article in the 2020 Research Institute Annual Report may be accessed through this link:

<https://2020.rsjh.ca/our-stories/roboknees/>

In addition, we are pleased to share St. Joseph's Healthcare Foundation published an article on the Foundation's website highlighting robotic surgery and integrating new technologies on February 9, 2021 titled "From Science Fiction to Reality: Artificial Intelligence and its Applications to Robotic Surgery at St. Joe's". The article can be viewed through this link:

<https://www.stjoesfoundation.ca/from-science-fiction-to-reality-artificial-intelligence-and-its-applications-to-robotic-surgery-at-st-joes/>

MILESTONES AND CRITERIA FOR SUCCESS – YEARS 1 TO 5

OUTCOME	UPDATE AS OF MARCH 2021
1. Clinical Outcomes	As of February 28, there have been 53 robotic surgeries performed with the MAKO Rio surgical robotic system.
2. Reputation of St. Joseph's, McMaster and Hamilton	Evaluating the reach of our Orthopaedic Robotic Surgery Centre and its success in bringing positive media and economic opportunities to our region.
3. Development of Partnerships that Optimize the MAKO Rio Robotic System	Strong, deepening relationships with McMaster and Stryker. Tracking the number of partnership inquiries and established partnerships created through the Orthopaedic Robotic Surgery Centre.
4. Expansion and Development of Innovative and Novel Procedures available in Canada	<p>With the introduction of this new robotic technology, we have begun to partner with colleagues in industry and engineering to incorporate advanced imaging (CT and MRI) with 3-D printing to accurately implant devices custom designed for individual patient anatomy. The precision imaging provided by the MAKO Rio enables us to prepare a customized implant specific to the patient's current knee characteristics.</p> <p>The opportunities to marry this technology with other emerging technologies such as Artificial Intelligence and Big Data will be truly innovative in the growing area of joint arthritis treatment.</p>
5. Research Productivity	Research will be conducted on the performance of the MAKO Rio System compared to minimally-invasive surgical methods. With only a handful of MAKO Rio Systems in the world, little research

	has been completed that conclusively demonstrates the System's ability to enhance surgical outcomes and patient satisfaction. Our research team will make this research a priority and we hope to be able to demonstrate the benefit of this robotic system for patients and the healthcare system.
6. Of Note	<p>A number of firsts in Orthopaedics include:</p> <ul style="list-style-type: none"> • 1st full total knee replacement in Canada robotically • 1st partial knee replacement in Canada robotically • 1st two partial implants in same knee instead of traditional total knee replacement • 1st randomized control trial comparing robotic partial replacement to conventional total knee arthroplasty

THANK YOU

On behalf of St. Joseph's Healthcare Foundation, please accept our heartfelt thanks to the trustees of the Hamilton Future Fund for your generous investment in building economic prosperity and innovation in Hamilton, through your investment in the Boris Family Centre for Robotic Surgery at St. Joseph's Healthcare Hamilton. It is because of visionary donors like you, that our Hospital can provide exemplary patient care, explore innovative research and make a positive impact on the lives of patients and families within our community, and beyond. Thank you again for your support of the growth of our robotics program and for entrusting St. Joseph's Healthcare Foundation with your generosity.

Sera Filice-Armenio

President & CEO

St. Joseph's Healthcare Foundation

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Since April 2013, St. Joseph's Healthcare Foundation has been one of a select group of charities across Canada to achieve accredited status through Imagine Canada's Standards Program. The program recognizes excellence by Canadian charities and not-for-profit organizations in board governance, financial accountability and transparency, fundraising practices, staff management and volunteer involvement.