



Princess Margaret Cancer Centre

ANNUAL REPORT 2019

Leadership Message

We are pleased to present the 2019 Annual Report for the Princess Margaret Cancer Centre at University Health Network (UHN). This report profiles our progress and activities in clinical care, research and education in the past year.

For the Princess Margaret, 2019 was a year of growth and reflection. We launched our new strategic plan, *Future Care Now: Create Cancer Care for 2030*, which outlines the foundational essentials and new strategic priorities that will guide our efforts to achieve impact as one of the top comprehensive cancer centres in the world. In alignment with our new strategy, we made progress in advancing data science, expanded our global partnerships, implemented new advances in care, and furthered our understanding of cancer through clinical, translational and basic research. The Princess Margaret clinical trials program continues to grow in volume and breadth with 2,765 patients enrolled in clinical trials in 2019.

With impending transitions in the Centre's leadership in 2020, an external review was commissioned by Dr. Kevin Smith, UHN CEO, and Dr. Brian Hodges, UHN Chief Medical Officer, to critically assess the Centre's progress, current state, future plans and ambitions. The reviewers endorsed the Centre's aspiration to be a top 5 Cancer Centre in the world and provided a unique perspective on our plans to continue to impact cancer care at a global scale.

We also experienced a significant shift in the governance of cancer care across the province. One central agency, Ontario Health, now oversees all cancer care delivery and clinical guidance to ensure the best quality care for patients. The Princess Margaret will continue to work closely with Ontario Health-Cancer Care Ontario, to facilitate system-wide collaboration and improvement.

We acknowledge the crucial role of the Princess Margaret Cancer Foundation in its tremendous support and philanthropic efforts that help make our programs and innovation agenda possible. We thank our donors, granting agencies, sponsors, and supporters for their continued patronage.

Finally, we extend our gratitude to our staff and volunteers for their relentless dedication and determination in providing the very highest standard of care and support for our patients, and for continually pushing the boundaries of innovation and collaboration.

For more information, please visit us online at ThePrincessMargaret.ca. 💜





Marnie Escaf MHA, HBBA
Senior Vice President,
Exexutive Lead
Princess Margaret Cancer Centre



Mary Gospodarowicz MD, FRCPC, FRCR (Hon)

Medical Director

Princess Margaret Cancer Centre



Aaron D Schimmer, MD, PhD, FRCPC

Research Director
Princess Margaret Cancer Centre

QUICK FACTS

ABOUT PRINCESS MARGARET CANCER CENTRE



Patients

82,571 Total Unique Patients Seen

17,433

New Patients

12,545

Malignant

3,444

Non-Neoplastic

1,444

Benign

New Malignant Diagnosis by Disease Group

1903 Gastrointestinal

1813 Genitourinary

1694 Breast

1225 Thoracic

1012 Gynecology

801 Leukemia & Other Hematology

786 Head & Neck

624 Thyroid/endocrine

621 Lymphoma

457 Bone and Sarcoma

356 Skin (Not Melanoma)

350 Central Nervous System

296 Melanoma

207 Myeloma

205 Eye

195 Other



Size

850,000 sqft

Clinical Space

329,400 sqft

Research Space

264

Beds Across UHN



People

Clinical Care

>3,420 Total

6,387

Surgical Procedures

88,555

Radiation Therapy Visits

187

Oncologists

570

Nurses

52,949

Systemic Therapy & Transfusion Visits 485

Stem Cell Transplants

562

Health Professions Staff

1,304

Researchers/ Research Staff 254,013



Research

Education

\$146.7M

Research Funding

1,062

Peer-Reviewed **Publications**

119

Nursing Students

146

Residents

193

New Clinical Research Studies Opened

7,879

Patients in Clinical Research Studies 186

Heath Professions Students

176

Fellows

2,765

Patients Entered in Clinical Trials

of Patients Treated in Clinical Trials

270

Research Trainees

2,298

Participants in **Enrichment Programs**

OUR CLINICAL PROGRAMS



Medical Oncology and Hematology

Amit M. Oza, MD

Head, Medical Oncology and Hematology, Princess Margaret Cancer Centre
Director, Cancer Clinical Research Unit, Princess Margaret Cancer Centre
Co-Director, Bras Family Drug Development Program, Princess Margaret Cancer Centre
Daniel E. Bergsagel Chair in Medical Oncology
Professor of Medicine, University of Toronto

Medical Oncology and Hematology is dedicated to providing the most advanced therapeutic approaches to patients diagnosed with solid or hematologic malignancies. Our team includes 67 medical oncologists and malignant hematologists, 12 hematologists in our Blood Disorders Program, 10 clinical associates, 70 clinical fellows, 7 hospitalists and more than 150 practitioners, nurses, trainees, and allied health professionals. We are one of the largest Divisions in the Faculty of Medicine at the University of Toronto and have the largest Blood and

Marrow Transplant Program in Canada. We have contributed to seminal practice changing studies and biologic knowledge through our early phase clinical trials programs. We are home to internationally recognized programs in genomic medicine, immunotherapy, myeloproliferative neoplasm, and hematology programs. Together, we endeavour to be global leaders in improving outcomes, and advancing care through continuous innovation and research.



Radiation Medicine Fei-Fei Liu, MD, FRCPC, FASTRO

Chief, Radiation Medicine Program, Princess Margaret Cancer Centre Head, Department of Radiation Oncology, University Health Network Professor and Chair, Department of Radiation Oncology, University of Toronto Senior Scientist, Princess Margaret Research Institute Peter and Shelagh Godsoe Chair in Radiation Medicine Chair, Medical Advisory Committee, University Health Network

The internationally acclaimed Radiation Medicine Program (RMP) is the largest single-site radiation treatment facility in the world. Our program is committed to patient-centred care with a focus on quality, safety, and knowledge dissemination. We improve the quality of radiotherapy worldwide through innovative research, education and cutting-edge radiation practices and technologies. RMP has the world's largest MR Program with two MR-guided radiotherapy facilities onsite (a state-of-the-art Magnetic Resonance-guided Radiation Therapy (MRgRT) and an MR-Linac), and the world's largest deployment

of the RayStation Treatment Planning System. Our program also includes 16 linear accelerators, a Leksell Gamma Knife Perfexion unit, a Gamma Knife Icon unit, an orthovoltage unit, a PET CT, a MRI 3T simulator, and three CT simulators. Our program includes 37 radiation oncologists, 30 medical physicists, 196 radiation therapists, and various clinical, research, administrative, and technical support teams. This interprofessional group of over 400 staff work together to deliver high quality and safe radiation treatment to over 9.000 cancer patients annually.



Supportive Care

Gary Rodin MD, FRCPC

Head, Department of Supportive Care, Princess Margaret Cancer Centre
Harold and Shirley Lederman Chair in Psychosocial Oncology and Palliative Care
Professor of Psychiatry, University of Toronto
Director, Global Institute of Psychosocial, Palliative & End-of-Life Care, University of Toronto

Supportive Care is dedicated to supporting patients and families through its programs and services to relieve physical and psychological distress and to maintain and improve quality of life throughout the trajectory of cancer. It is comprised of Psychosocial Oncology, Palliative Care, and Cancer Rehabilitation and Survivorship. Our clinical team includes social workers, psychiatrists, psychologists, palliative care physicians, nurses, spiritual care professionals, music therapists, art therapists, kinesiologists, occupational therapists,

physiotherapists, registered massage therapists, dietitians, and other allied health professionals. Supportive Care has become an internationally recognized program for research and education, developing and testing novel approaches to treatment and training learners from all over the world. Its global outreach has also been enhanced by the Global Institute of Psychosocial, Palliative and End-of-Life Care (GIPPEC) Care. Supportive Care supports a holistic and comprehensive approach to cancer care for patients and their families at all stages of the disease.



Surgical Oncology

Gelareh Zadeh MD, PhD, FRCSC

Chief, Surgical Oncology, Princess Margaret Cancer Centre Senior Scientist, Princess Margaret Research Institute Wilkins Family Chair in Neurosurgical Brain Tumour Research Head of Surgical Oncology, Cancer Care Ontario - Toronto Central Region Associate Professor, Department of Surgery, University of Toronto

Surgical Oncology is committed to providing access to leadingedge surgical techniques and technologies that improve patient outcomes, with a focus on delivering comprehensive, compassionate care for our patients. With 71 dedicated cancer surgeons, our multidisciplinary surgical teams offer services for central nervous system, breast, skin and melanoma, sarcoma, urology, head and neck, thoracic, hepatobiliary, colorectal, gynecologic, ocular neoplasms, oncological reconstruction, endocrine, and dental oncology. We have an internationally recognized interdisciplinary program dedicated to clinical and translational research, innovation, and education. We endeavour to meet the increasing demand for the surgical management of cancer, and we are committed to providing the best practice of care through collaboration, outreach, and partnership with our community.



Collaborative Academic Practice

Pamela Savage RN, MAEd, CON(C)

Director of Professional Practice, Princess Margaret Cancer Centre

The Collaborative Academic Practice portfolio is firmly rooted in the strength and contribution that each profession brings to the whole. Our Portfolio includes 15 health professions, including staff in Anesthesia, Chiropody, Clinical Nutrition, Kinesiology, Medical Imaging Technology, Nursing, Occupational Therapy, Physiotherapy, Psychology, Respiratory Therapy, Radiation

Therapy, Social Work, Speech Language Pathology, Spiritual Care, and Therapeutic Recreation. Collaboratively we lead the synthesis of practice, education and research within the individual professions and collectively integrating practice amongst the 15 health professions, connecting knowledge to care.

ENABLING FUTURE CARE NOW

The Princess Margaret Data Science Program

Cancer is a complex group of diseases. As we expand our understanding of these diseases and integrate new technology into care and research, the volume of data generated continues to grow exponentially. The progress in computerization and data science presents a unique opportunity to integrate, analyze and extract meaning from rich data assets.

The Princess Margaret Data Science Program (PMDSP) aims to be at the forefront of applying and discovering novel analytical approaches and predictive models that could be leveraged to inform care, fuel new research, optimize operations, and enhance learning. The program engages a diverse team of clinicians, scientists, analysts and technology developers and is co-led by Tran Truong - Program Director, Dr. Benjamin Haibe-Kains - Scientific Lead, Dr. Alejandro Berlin - Clinical Lead, and Luke Brzozowski - Partnership Lead. The PMDSP is aligned with the UHN-wide data science strategy and supports local, national and international data science collaborations.

Leveraging data driven tools in patient care can push the boundaries of delivering personalized medicine and maximize our ability to predict outcomes, identify the most effective individualized therapies, monitor treatment response, and prevent toxicities. "There is no doubt that access to multidimensional and high-quality data can empower providers and researchers to new heights, in direct benefit of our current and future patients," says Dr. Berlin. Data science also holds the promise of enabling transformational discoveries through basic and translational research that can uncover previously undetectable trends. There is untapped potential that can arise from integrating heterogeneous, seemingly disconnected sources of data such as clinical and research data sets, and external data from community, environmental, social and patient-reported sources. "We are at a point where the dimensionality of the data collected during the patients' journey and in research laboratories exceeds by far what the human brain can grasp. The development and adoption of new computational tools will be crucial to assist clinicians and researchers in their work," says Dr. Berlin.

To realize this potential, the PMDSP is working to develop an integrated cancer data platform, utilizing UHN's advanced data lake technology to centralize multi-modal data sources including clinical documentation, medications, imaging, multi-'omics' (e.g., genomics, transcriptomics, proteomics), patient recorded outcomes and research registries. In



addition, the program is working to develop an oncology data catalog and a platform for cancer centre-wide outcomes collection that will improve data capturing and enhance documentation.

A series of catalyst projects were launched in 2019 to foster engagement across the centre and inform the development of a data science framework at the Princess Margaret. The projects were selected based on scientific quality, opportunities for large-scale data integration and the potential to build infrastructure and enhance our collective expertise. The ultimate results of these projects will have broader impact and contribute to the development of platforms to support delivery of value-based care and research, automated processes for integrating and analyzing institution-wide data routinely, and computational platforms to jointly analyze multimodal molecular, imaging and clinical data.

Opportunities for learning and collaboration between data scientists, clinicians and researchers are vital to deepen our understanding of the benefits, applications and limitations of Al and deep machine learning in cancer. The team is poised to collaborate with leaders in Al research as well as identify opportunities for internal collaborations across programs, departments and professions. "Collecting complex biomedical data, developing advanced machine learning algorithms and deploying new computational models in research and clinical settings require a highly multidisciplinary team," says Dr. Haibe-Kains. "This is why the PMDSP is working with the broad community of the Princess Margaret towards a common goal: improve cancer care for the benefit of our patients."

The Princess Margaret Data Science Leadership Team



Tran Truong,Program Director



Luke Brzozowski, Partnerships Lead



Benjamin Haibe-Kains, Scientific Lead



Alejandro Berlin, Clinical Lead

ADVANCING ORAL HEALTH FOR PEOPLE AFFECTED BY CANCER

The Princess Margaret Dental Oncology Program

Oral health is critical to overall health. For many patients diagnosed with cancer, access to specialized dental care before, during and after treatment is essential to secure the optimal outcome.

The Princess Margaret Dental Oncology Program aims to be a leader in clinical care, education and research in oral health as it relates to cancer. Led by Dr. Michael Glogauer, Head of Dental Oncology at the Princess Margaret and Dentistry at UHN, the program engages a number of highly-specialized dentists who focus on oncology including dental specialists in oral pathology, oral radiology, oral and maxillofacial surgery, maxillofacial prosthodontics, and periodontics. The clinic also includes a dental hygienist and its own dental laboratory.

The Dental Oncology Clinic diagnoses, treats and prevents dental problems that may arise as a result of cancer treatment. Approximately 8% of all patients treated at the Princess

Margaret are referred to the clinic, amounting to 1,450 new patients and more than 14,000 visits per year (2019). The clinic provides rapid screening and dental treatment for patients undergoing head and neck radiation, bisphosphates and high-dose chemotherapy for hematologic malignancies, and bone marrow transplants, all of which can have a significant impact on oral and overall health. Dental professionals diagnose and treat potentially life-threatening conditions such as osteonecrosis of the jaw after radiation to the head and neck or intravenous bisphosphonate therapy, and aid with the prevention of post-transplant complications that can occur in immuno-compromised patients.

The Dental Oncology Clinic offers a diagnostic mouth clinic in conjunction with an ear, nose, and throat surgeon to provide rapid assessment for patients with suspicious lesions. Moreover, the department can complete surgical implant placement and oral and maxillofacial intraoral prosthetics to facilitate maxillofacial rehabilitation.

In an effort to address the shortage of dentists with specialized expertise in oncology, the program has implemented a number of education initiatives. This includes establishing a one-year dental oncology fellowship - the first of its kind in Canada and only one of three in North America - that aims to train dentists in the management of patients who have cancer or are survivors of cancer. In addition, interdisciplinary education sessions are offered for community-based dentists to upskill knowledge and expertise so patients can return to their family dentist.

There are currently no international guidelines in place pertaining to standards of care for dental oncologists. Drs. Michael Glogauer, Erin Watson, Jessica Metcalfe and others are working to develop a Pan-Canadian network of oncology dentists to establish best-practice standards for the provision of dentistry, beginning with developing guidelines for the dental management of patients who undergo head and neck radiation.

Dental Oncology is developing a robust research program that exemplifies the unique and diverse contributions of dentistry to advancing cancer care. This includes investigating oral based biomarkers for monitoring susceptibility to infection in neutropenic and bone marrow

transplant patients, assessing the use of an oral rinse designed to detect acute graft-versus-host disease, development of evidence-based guidelines for dental therapy pre-radiation in head and neck cancer patients, and investigating the impact of pre-head and neck surgery dental care on post-operative infection rates.

"Our goal of providing the best dental care available to cancer patients while carrying out cutting edge research in dental oncology will help us fulfill our mandate of optimizing the quality of life for patients," says Dr. Michael Glogauer.

The Princess Margaret Dental Oncology Program Leadership Team







From left to right:

Michael Glogauer, Head, Dental Oncology

Erin Watson, Deputy Head, Dental Oncology

Jessica Metcalfe, Education Director, Dental Oncology

The Genetics of Cancer

Approximately 10% of all cancers are caused by inherited germline mutations. Hereditary cancer syndromes (HCS) dramatically elevate an individual's risk of developing cancer and early diagnosis through genetic testing enables clinicians to explore cancer risk-reducing interventions, personalize treatment and implement surveillance programs.

The Genetics Program aims to identify every hereditary cancer patient and family at the Princess Margaret, create personalized cancer care for all carriers, maximize the research capacity of every germline carrier to inform the biology of cancer prevention, treatment and recurrence, and increase access to genetic testing at a local and national level. The program is led by Dr. Raymond Kim and engages seven genetic counsellors.

The program implemented the ONCOGENE project to expedite access to genetic testing, demystify the genetic testing process, educate clinicians, provide counselling, and enable use of genetic testing as a molecular triage tool. Current research to investigate novel genetic technologies



The Genetics Program Team

includes the INSIGHT study with the Genomics Program which aims to conduct whole genome sequencing for people at risk of HCS, as well as tumourgenomic analysis to uncover mechanisms of hereditary tumour formation. In addition, Drs. Raymond Kim and Trevor Pugh are co-leading the CHARM study, which is examining the use of liquid biopsy in germline carriers as an early detection tool. "The future of cancer care and prevention lies in our DNA," says Dr. Kim. "Our genetics team is poised to find these answers using the latest in genetic and genomic technologies."

The Latest Generation of Image-Guided Therapy



RMP Interdisciplinary Team (Kelvin Young Photography)

The Princess Margaret has a rich history of developing innovative MRI-guided technologies and treatment approaches. The Radiation Medicine Program (RMP) saw

a significant milestone in advancing precision medicine with the installation of the Elekta Unity MR-Linac, the latest generation of image-guided radiotherapy systems that can adapt the radiation dose in real time.

The Princess Margaret is one of only 11 other sites in the world to have the Unity MR-Linac. While MRI machines and radiation treatment linear accelerators have been utilized separately for several years, this is the first time that the combined technologies have made it possible to see the boundaries between tumours and organs and observe how they move during treatment. The MRI component produces 3-D images, with sharp contrast between the tumour and surrounding tissue. This decreases the risk of treating healthy tissue close to the cancer.

RMP is part of the international Elekta MR-Linac Consortium comprised of over 20 institutions, all collecting data on imaging, treatment doses, tumour control, tissue toxicity and quality of life. The Princess Margaret will be leading the Consortium's liver tumour site group in developing protocols and approaches for treating liver cancer.

SPOTLIGHT

Dr. Gelareh Zadeh

Dr. Gelareh Zadeh is the Head of Surgical Oncology at the Princess Margaret and Medical Director for the Krembil Neuroscience Centre at Toronto Western Hospital. Dr. Zadeh is a world renowned neurosurgeon and scientist with clinical and research programs that include management of skull base tumours, brain metastases, pituitary tumors, and neurofibromatosis. She has a research laboratory focused on multi-platform molecular analysis of brain tumors and understanding the molecular response to targeted therapies. She holds the Wilkins Family Chair in Brain Tumor Research and received the 2018 William E. Rawls Prize Award for Excellence in Cancer Research from the Canadian Cancer Society in recognition of her seminal research contributions.

Dr. Zadeh is involved in a number of national and international organizations. In 2019, she was elected as the first woman president of the Society of Neuro-Oncology, the largest and most recognized organization dedicated to promoting research and education for cancers of the brain and spinal cord. 💜



Program Medical Director, Krembil Neuroscience Centre

Surgility - Agile Surgical **Engineering**

The Surgility program tackles technology challenges and innovation opportunities across UHN operating rooms. Led by Dr. Shaf Keshavjee and Techna the program brings together clinical teams and medical engineers to mitigate recurrent problems and realize new technology opportunities through prototyping, testing, and implementation.

Techna medical engineers and other experts are embedded within the surgical community allowing for integration of science, technology, and clinical practice to improve service models and establish processes for rapid technology validation. Projects underway include guided surgical procedures using pre- and intra-operative multi-modal cancer imaging, augmented reality, 3D printing, natural computer interaction through voice and gesture control, and even working on a framework to permit transportation of organs via drones.

The Techna Augmented Reality (AR) Program led by Dr. Stefan Hofer is focused on the development of AR technology to enable image-guidance with improved spatial context in planning, education, and intervention. This contrasts traditional displays for image guidance where virtual models are rendered on a separate display away from the operating field. Techna's AR system is able to provide real-time



feedback and multi-user connectivity for remote or in-person collaboration. These tools can enhance surgical precision, reduce the length of surgical procedures, and potentially eliminate the need for invasive and extensive interventions.

A number of surgical oncologists are collaborators leading the application of these new technologies in cancer surgery. With most cancer patients requiring surgery, equipping operating rooms with the next generation of technology can contribute to improving our ability to prevent, detect and treat cancer today and in the future.



SPOTLIGHT

Dr. Gary Rodin

Dr. Gary Rodin is the Head of Supportive Care and Senior Scientist at the Princess Margaret Cancer Centre. He holds the Harold and Shirley Lederman Chair in Psychosocial Oncology and Palliative Care and is the founder and director of the Global Institute of Psychosocial, Palliative and End-of-Life Care (GIPPEC). Under his leadership, Supportive Care has achieved an international reputation for its academic and clinical excellence.

Dr. Rodin leads robust clinical and research programs on the psychosocial dimensions of advanced and terminal disease and the development and evaluation of novel interventions to improve the quality of life and the quality of dying and death. Through GIPPEC, Dr. Rodin has established international partnerships in Europe, Asia, Africa, Australia and the Middle East to contribute to global access to palliative and supportive care for patients and families facing advanced disease and the end of life.

Dr. Rodin is the recipient of a number of awards throughout his career, including The Lifetime Achievement Award from the Canadian Association for Psychosocial Oncology in 2012 and the International Psycho-Oncology Society Bernard Fox Award in 2017 in honour of his outstanding contribution to the field of psycho-oncology. Dr. Rodin will be succeeded by Dr. Camilla Zimmermann as Head of Supportive Care in 2020.

Turning "Junk" into DNA Gold

Investigating the genetic material of a cancer cell has led to the discovery of new protein targets in drug development against prostate cancer. Using state-of-the-art, whole genome sequencing technologies on prostate tumour samples, our researchers focused on the often overlooked non-coding regions of the genome – vast stretches of DNA that are free of genes, but nonetheless harbor regulatory elements that determine if genes are turned off. Previously dismissed as "junk" DNA, non-coding regions were once thought to have little to offer for a cure against cancer. "Our goal is to conquer cancer in our lifetime," says lead scientist Dr. Mathieu Lupien. "We have to look everywhere including the 'darkest' parts of the genome of cancer cells for hidden 'gold'".

Dr. Lupien and a 21-member team of national and international clinicians, scientists, pathologists and computational scientists assessed the role of more than



Dr. Mathieu Lupien, Senior Scientist

270,000 mutations found in primary prostate tumours. They found that these accumulate in specific non-coding regions bound by a set of proteins that control the on/off state of genes. Inhibiting these proteins blocks growth of prostate cancer cells, showing their value for drug development. The research represents new approaches to exploit the rich information from all mutations found in tumours and to prioritize targets for therapy.

Triggers and Targets in the Tumour Microenvironment

A research group led by Drs. Michael Milosevic and Marianne Koritzinsky, initiated "Triggers and Targets in the Tumour Microenvironment", a project that aims to expand on existing groundbreaking research into the effects of hypoxia on tumour aggressiveness. The project will look at four highly aggressive cancers: pancreatic cancer, glioblastoma multiforme, castrateresistant prostate cancer and cervical cancer.

"During previous iterations of the project we learned that the tumour microenvironment is a unique ecosystem made up of different cells, and that its composition, including hypoxia, can drive the aggressiveness of a cancer and determine if a patient's tumour is resistant to therapy," says Dr. Koritzinsky.

The project was awarded \$6 million-dollars over six years from the Terry Fox New Frontiers Program Project grant. The aim is to continue gaining a deeper biological understanding of the role each element in the microenvironment plays and subsequently begin targeting specific vulnerabilities in each patient to improve their outcomes.

"By capitalizing on the flow of information back and forth from the clinic to the lab we will advance the science on how the microenvironment influences cancer progression, cancer control, metastasis formation and treatment response in our patient population," says Dr. Milosevic. "I think it's hugely exciting because over the next few years we can make a really big difference in how patients with cancer are treated."



Drs. Michael Milosevic and Marianne Koritzinsky



Drs. Brian Raught and Linda Penn teamed up to overcome gaps in understanding how one protein, called MYC, can drive over 50% of cancers. MYC is a master-regulator that controls the activities of other genes. When MYC is out-of-control, normal cells are overwhelmed with signals to grow, leading to cancer. For decades it was known that MYC was dependent on recruiting other proteins that promote

Uncovering Bio-Mechanisms

cancer, yet the identity of these partner proteins remained unclear as the technology to conduct this research was not available. Research led by Drs. Raught and Penn has revealed the identity of the critical proteins MYC needs to work with to drive cancer.

Developing MYC inhibitors as anti-cancer agents would mark a key advance, but traditional approaches have failed. By identifying the partner proteins of MYC that are essential for MYC to be a cancer driver, new strategies to develop anti-MYC therapies are unveiled. Research is now underway to develop approaches to "silence" MYC and prevent it from enabling uncontrolled cancer cell growth.

Advancing Survivorship for Adolescents and Young Adults

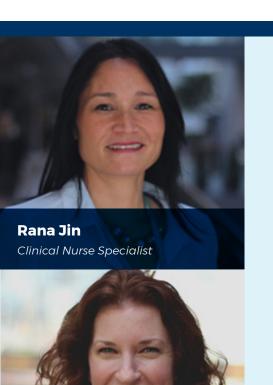
Adolescents and Young Adults (AYA) diagnosed with cancer have a unique set of psychosocial and medical needs. Understanding that the standard disease-focused approach was not addressing the distinct needs of AYA patients, Supportive Care launched the AYA Program, which aims to optimize the quality of the cancer journey for all AYA patients. Led by Dr. Abha Gupta and Laura Mitchell, the program seeks to identify individual needs of the patient, provide relevant education and support, and link patients to necessary resources.

The AYA program hosted the AYA Survivorship Symposium: A New Vision in March 2019. The symposium brought together local and international experts and trainees to begin building a framework for the delivery of survivorship care for survivors of young adult cancer. The symposium tackled a variety of topics, including community supports, sexual health after treatment, optimizing survival through exercise, late effects of cancer treatment, and early integrated psychosocial and palliative care.



Symposium co-leads Laura Mitchell (L) and Abha Gupta (R).

Over 120 delegates participated and feedback from the symposium was overwhelmingly positive. Proceedings from the symposium have been submitted for publication and the AYA program will use the learnings from the symposium to heighten awareness and find new avenues to address the unique needs of AYA before, during and after cancer treatment.



Allison Loucks
Clinical Nurse Specialist

SPOTLIGHT

Rana Jin and Allison Loucks

Rana Jin and Allison Loucks are two Clinical Nurse Specialists at the Older Adults with Cancer Clinic at the Princess Margaret. They are regarded by patients and peers alike for the highly skilled and compassionate care they provide to frail and vulnerable older adults as well as the contributions they have made to the field of geriatric oncology.

Rana and Allison's contributions span clinical care, education and research, and include enhancing the role of the geriatric oncology nurse in the care of older adults, streamlining the referral process for patients who require supportive care intervention programs, co-authoring book chapters on geriatric oncology, and participating in the development of international guidelines for the International Society of Geriatric Oncology. Both are recipients of the Esther and Saul Baker Award in Geriatrics at UHN and Mount Sinai Hospital and both were nominated for the prestigious Boehringer Ingelheim Oncology Nurse of the Year Award from the Canadian Association of Nurses in Oncology in recognition of their contributions; Rana was the 2019 recipient.

Developing the Cancer Leaders of Tomorrow

Cancer is a defining health issue in the 21st century for countries at all stages of development. Sustained local and global action is required to ensure access to high-quality, affordable cancer care for all and educating the next generation of cancer leaders will be key to developing effective health care systems. The Princess Margaret Global Oncology Leadership Development Program (GOLD) is a joint initiative between Cancer Education and the Global Cancer Program that provides a series of lectures and interactive small group sessions designed to equip fellows with the skills, networks and opportunities to develop as leaders in cancer care at a local, regional and global level.

In 2019, the GOLD program welcomed 31 fellows from over 20 countries to the first in-person session, which focused on key themes such as global cancer control and cancer policy and the health system. Co-led by Drs. Meredith Giuliani and

Danielle Rodin, the program's focus is on developing and strengthening cancer care leadership at a systems level. The curriculum is particularly relevant for international fellows who upon their return home will be responsible for leading cancer systems, and for domestic fellows with an interest in health systems leadership.



2019-2020 GOLD Cohort

Building Capacity for Palliative Care through Education



Palliative care is an essential component of the treatment journey for many patients. It aims to enhance a patient's quality of life through pain management and psychosocial and spiritual care techniques that align with their beliefs.

Palliative care fellowships are not well-established internationally and many existing palliative care programs do

not have the capacity to train and accommodate international learners. Recognizing this gap, Supportive Care established the International Palliative Fellowship program targeting international learners looking to study palliative care in the context of the Canadian healthcare system.

The program provides a dynamic clinical experience that spans malignant and non-malignant populations across all clinical settings, with opportunities for learners to tailor clinical rotations based on areas of interest. Fellows can also complete a clinical or a non-clinical research fellowship. Prior to beginning the program, international fellows are invited to complete an online bridging program to help orientate them to the Canadian healthcare and cultural landscape. Although the program is in its infancy, it has attracted over 30 highly applicants from 19 different countries, and enabled partnerships with international physicians and academic centres.

Assessing our Accomplishments and Affirming our Ambitions

The Centre has undergone tremendous growth in recent years and has established leading edge and comprehensive programs in clinical care, education and research. Recognizing this growth, the launch of the 2019 *Future Care Now: Create Cancer Care - 2030* strategic plan, and impending transitions in the Centre's leadership, an external review was commissioned by Dr. Kevin Smith, UHN CEO, and Dr. Brian Hodges, UHN Chief Medical Officer, to critically assess the Centre's progress, current state, future plans and ambitions.

Four cancer leaders were invited to join the Princess Margaret External Review Committee - Drs. Michael Baumann, Elizabeth Eisenhauer, Raphael Pollock, and Benedick Fraass. The reviewers met with leaders across the Princess Margaret and UHN and conducted an in-depth review of clinical care, translational research, education programs and partnerships. The reviewers endorsed the Centre's aspiration to be a top 5 Cancer Centre in the world and provided a unique perspective on our plans for the Princess Margaret to continue to impact cancer care on a global scale.

The Princess Margaret External Review Committee



(L to R): Prof. Michael Baumann, Prof. Elizabeth Eisenhauer, Prof. Raphael Pollock, Prof. Benedick Fragss.

Adapting to Change and Building Connection



Each year, the Princess Margaret hosts a number of staff engagement events aimed at stimulating a broad level of employee engagement and fostering an inclusive, healthy and engaging culture.

In 2019, the Princess Margaret held two retreats designed to provide an opportunity for individual and team reflection and development. The first retreat, "What's Your Change-Ability?", focused on staff empowerment and recognition, and explored human factors and adaptive capacity that can equip teams with tools to thrive during periods of change. The second retreat, "Celebrate, Connect and Commit", celebrated the accomplishments that help create an engaging workplace and culture of respect. Staff connected to build strong, supportive relationships, and committed to sharing ideas for improvement and making one thing – or more – better in our work environment.

Cancer Care Ontario Transfers to Ontario Health



The governance of cancer care across the province underwent a systematic shift in 2019. Cancer Care Ontario, Health Quality Ontario, eHealth Ontario, Health Shared Services Ontario and HealthForceOntario Marketing and Recruitment Agency transferred into Ontario Health under the Connecting Care Act, 2019. Ontario Health now oversees all cancer care delivery and clinical guidance to ensure the

best quality care for patients. To date there is little change in the activities of Cancer Care Ontario, now a business unit of Ontario Health.

The Ontario Cancer Plan 5 for 2019-2023 was released and provides a road map for how Ontario Health - Cancer Care Ontario, the Regional Cancer Programs, and health system partners will work together to reduce Ontarians' risk of developing cancer and improve outcomes for those affected by cancer. The Princess Margaret continues to work closely with Ontario Health-Cancer Care Ontario to facilitate system-wide collaboration and improvement.



The Toronto Central Regional Indigenous Cancer Program (ICP)

The Toronto Central Regional Indigenous Cancer Program (ICP) partnered with Anishnawbe Health Toronto Traditional Palliative Care Team to offer a novel program that provides First Nations, Inuit and Métis (FNIM) patients access to Traditional Healers, Elders and Medicine People for ceremonies and traditional practices throughout their palliative journey. This program allows care for the whole person and honours spiritual beliefs, traditions and practices. ICP navigators empower and enable traditional practices and ceremonies to take place where the patient is being cared for with compassion, understanding and respect. This program will not only improve the quality of life for patients and their families but will also impart an understanding to their circle of care about the traditional practices, ceremonies, medicines and teachings, creating a culturally supportive system that honours the Indigenous Path of Well-Being.

The ICP and Toronto Central Regional Cancer Program hosted over 40 regional partners for the inaugural KAIROS Blanket Exercise Event. The KAIROS Blanket Exercise is a unique, interactive and participatory history lesson that was facilitated by the ICP Indigenous Patient Navigator, Leonard Benoit. The Exercise was a unique opportunity for regional partners to come together to learn about the Indigenous community and its rich history.





Over 75 pairs of socks were donated to the Native Women's Resource Centre from participants of the KAIROS Blanket Exercise

New Leadership



Dr. Alejandro Berlin,Medical Director, Data Science,
Outcomes and Smart Cancer Care

Alejandro was appointed Medical Director, Data Science, Outcomes and Smart Cancer Care. He is a clinician scientist and Assistant Professor in the Department of Radiation Oncology, University of Toronto. He has led the deployment of novel technologies such as Al-based radiotherapy planning.



Dr. Sami Chadi,Lower Gl Disease Site Lead

Sami was appointed Lower Gastrointestinal Disease Site Lead. He is an Assistant Professor in the Department of Surgery at University of Toronto, with a practice focus in colorectal surgery, specifically in rectal cancer.



Dr. Michael Glogauer,Head. Dental Oncology and Chief of
Dentistry at UHN

Michael was appointed the Head of Dental Oncology at the Princess Margaret and Chief of Dentistry at UHN. He is a Professor of Dentistry at the University of Toronto with research programs in oral innate immunity, neutrophil function and periodontal diseases.



Anet Julius,Interim Director, Collaborative
Academic Practice

Anet was appointed Interim Director of Professional Practice. She is the TC South Regional Oncology Nursing Lead and Adjunct Lecturer with the Faculty of Nursing, University of Toronto. She previously held the position of Senior Professional Practice Leader at the Princess Margaret.



Dr. Monika Krzyzanowska, *Medical Lead, Quality*

Monika was appointed Medical Lead of Quality. She is a Professor of Medicine and Head of the Division of Medical Oncology at the University of Toronto. She conducts health services research and has interest in advancing the science

and practice of quality in cancer care.



Dr. Daniel Letourneau,Head, Medical Physics

Daniel was appointed Interim Head of Medical Physics. He is an Assistant Professor in the Department of Radiation Oncology, University of Toronto. He was Associate Head of Medical Physics since 2013 and oversaw the implementation of key initiatives within RMP.



Lesley Moody, Director, Solid Tumour and Ambulatory Care

Lesley was appointed Director of Solid Tumour and Ambulatory Care. She was previously the Director of the Person-Centered Care at CCO. Immediately prior to her appointment, she was the Regional Director of CCO for Toronto Central South.



Dr. Danielle Rodin,Director, Global Cancer Program

Danielle was appointed inaugural Director of the Global Cancer Program. She is an Assistant Professor in the Department of Radiation Oncology, University of Toronto. She serves on the Board of the Union for International Cancer Control and has academic interests in global health systems and quality of cancer care.



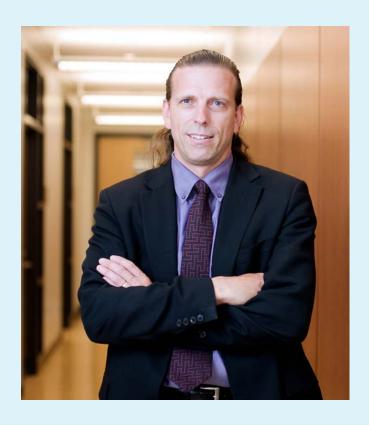
Dr. Karen Yee,

Chair, Cancer Committee

Karen was appointed Chair of Cancer Committee. She is an Associate Professor of Medicine at the University of Toronto and the Leukemia Site Lead at the Princess Margaret. She conducts research in myelodysplastic syndrome, acute leukemia, and novel chemotherapeutic agents.

TRIBUTE

Dr. David Jaffray



Dr. David Jaffray has made enormous contributions in advancing medical physics and the technology agenda at the Princess Margaret as well as driving the translation of research activities into clinical innovations. David joined the Princess Margaret as the Head of Medical Physics and Senior Scientist in the Princess Margaret Cancer Research Institute in 2002. In 2015, he was appointed as the Executive Vice President for Technology and Innovation at UHN. In addition to these appointments, David founded and led the Techna Research Institute for accelerated development and exploitation of technology for improved health. The Techna Institute intends to shorten the interval from technology discovery and development to application for the benefit of patients and the health care system.

As the Orey and Mary Fidani Chair in Radiation Physics at the Princess Margaret, David was relentlessly committed growing capacity for innovation and leading the deployment of technological solutions to assure the safety and quality of radiotherapy. He spearheaded collaborative efforts to accomplish a number of developmental milestones at the Princess Margaret, including the implementation of Image-guided Radiation Therapy, restructuring Medical Physics Department, and the development of MR-guided radiotherapy systems that enabled leading practices in radiation medicine.

As leader of the Global Task Force on Radiotherapy for Cancer Control, he fostered numerous global initiatives and spearheaded partnerships with the European Organization for Nuclear Research and International Cancer Expert Corps to develop new technological approaches to deliver robust and high quality radiotherapy. He led the Ontario Consortium on Adaptive Interventions in Radiation Oncology, the largest program in adaptive radiation therapy research in the world that links four cancer programs across the province and 11 industry partners to facilitate the development and commercialization of adaptive radiation therapy.

He received numerous prestigious honours including the Sylvia Sorkin-Greenfield Award in 2001, the Farrington Daniels Award in 2002, and the Sylvia Fedoruk Award 2003. Notably, he received the Gold Medal Award from the American Society of Radiation Oncology in 2018, the highest honor bestowed on members who have made outstanding contributions to the field of radiation oncology.

In 2019, David was recruited to the M.D. Anderson Cancer Center in Houston, Texas as the Senior Vice President and Chief Technology and Digital Officer, and Professor of Radiation Physics and Imaging Physics at the University of Texas. We wish him success and hope to continue to collaborate on ongoing research projects.



New Recruits



Dr. Ezra Hahn, Staff Radiation Oncologist
Ezra obtained his medical degree at the University of Toronto and trained in genitourinary, breast, head and neck, and sarcoma disease sites at the Princess Margaret.





Dr. Leigh Conroy, Staff Medical Physicist
Leigh completed her PhD at the University of Calgary and
completed the Physics Residency Program at the University of
Toronto.

Dr. Edward Taylor, Staff Medical Physicist
Edward completed his physics residency and PhD in condensed matter physics at the University of Toronto.





Dr. Paulina Cybulska, Staff Surgical Oncologist
Paulina obtained her medical degree at the University of Ottawa and trained in gynecologic oncology at Memorial Sloan Kettering Cancer Centre.

Dr. Trevor Reichman, Staff Surgical Oncologist
Trevor received his medical degree at Bucknell University and trained in organ transplantation and HPB Surgery at the University of Toronto.





Dr. Kim Tsoi, Staff Surgical Oncologist
Kim obtained her medical degree at the University of Toronto and trained in sarcoma at the Royal Orthopedic Hospital in the United Kingdom.

Dr. Nazanin Fallah-Rad, *Staff Medical Oncologist*Nazanin received her medical degree at the University of Manitoba and trained in genitourinary and gastrointestinal

oncology at the Princess Margaret.





Dr. Grainne O'Kane, Staff Medical Oncologist

Grainne obtained her medical degree from Trinity College Dublin and trained in thoracic and gastrointestinal malignancies at the Princess Margaret.



Dr. Zeyad Al-Shaibani, Staff Hematologist
Zeyad received his medical degree from Sana University in
Yemen and trained in allogeneic transplantation, leukemia and lymphoma at the Princess Margaret.



Armin obtained his medical degree at Ludwigs-Maximilians-University in Munich, and completed his hematology training at the Universities of Regensburg and Munich.





Dr. Melissa Li, Staff Palliative Care Physician Melissa completed her medical degree and training in palliative care at the University of Toronto.

Dr. Brenda O'Connor, Staff Palliative Care Physician Brenda trained in palliative medicine and received her Doctor of Medicine from Trinity College Dublin.





Dr. Alex Saltman, Staff Palliative Care Physician
Alex trained in rheumatology and internal medicine at the
University of Toronto and completed clinical training in palliative
care at UHN.

Dr. Kayla Wolofsky, Staff Palliative Care Physician Kayla received her medical degree from the University of Queensland and trained in interdisciplinary palliative care at Harvard University.





Dr. Jody Morita, Staff Psychiatrist

Jody received his medical degree from the University of British Columbia and trained in psychosomatic medicine and psycho-oncology at Memorial Sloan Kettering Cancer Center and Weill Cornell Medical Center.

Dr. Christian Schulz-Quach, Staff Psychiatrist and Psychotherapist

Christian completed his medical training at Witten/Herdecke University in Germany, King's College UK, and Harvard.





Dr. David Langelier, Staff Cancer Rehabilitation Physician David obtained his medical degree from the University of Calgary and trained in cancer rehabilitation in Toronto.

Departures



Dr. Nathan Becker

Nathan worked in RMP for six years as the Physics Lead for CT and CBCT Imaging. He co-developed MIRA, a web-based automation and visualization platform to analyze multi-modal patient data over the course of radiotherapy treatment.

Dr. Young-Bin Cho

Young-Bin worked as a Medical Physicist for 18 years. He demonstrated the role of adaptive radiation therapy for treatment of cervical cancer and commissioned treatment planning on the ICON.





Jane Finlayson

Jane was a Senior Public Affairs Advisor and member of the Princess Margaret senior management team for 13 years. She provided communications advice to executive leadership, managed media relations and provided training for science communications.

Dr. David Jaffray

David joined the Princess Margaret as the Head of Medical Physics and Senior Scientist in 2002. He founded and led the TECHNA Institute and subsequently assumed the role of Executive Vice President for Technology and Innovation at UHN from 2015-2019.





Dr. Wilfred Levin

Wilfred was a Radiation Oncologist at the Princess Margaret for 32 years. His research interests included management of radiation late effects in adults and the use of optical coherence tomography to investigate post-radiation changes.

Terry Michaelson

Terry worked at the Princess Margaret for 28 years and served as the RMP Director of Technical Systems. He led the implementation of the RMP Oncology Information System and transitioned the program to a paperless and filmless treatment delivery process.





Dr. Doug Moseley

Doug worked in RMP for 17 years. He worked on the development and implementation of image-guided radiation therapy and was Deputy Head of Radiation Physics at the Stronach Regional Cancer Centre.

Pamela Savage

Pamela worked at UHN and the Princess Margaret for 35 years as the Director of Professional Practice and Nursing Lead for Toronto Central South. She provided oversight to nursing and health professions and led international consulting work in Qatar, Kuwait and Kenya.



Awards

Catherine Coolens – Fellow of the Institute of Physics and Engineering in Medicine

Jennifer Croke – Excellence in Clinical Teaching Award, Professional Association of Residents of Ontario

Daniel De Carvalho - Member of the College of New Scholars, Artists and Scientists, Royal Society of Canada

John Dick — International Society for Stem Cell Research Award for Innovation

Benjamin Haibe-Kains – Bernard and Francine Dorval Prize, Canadian Cancer Society

David Hodgson - Honorary Fellow, Royal College of Surgeons of Ireland

Doris Howell - Lifetime Achievement Award, Canadian Association of Nurses in Oncology

Rana Jin – Boehringer Ingelheim Oncology Nurse of the Year Award, Canadian Association of Nurses in Oncology

Gordon Keller – Ogawa-Yamanaka Stem Cell Prize, Gladstone Institutes

Monika Krzyzanowska – Fellow of the American Society of Clinical Oncology, American Society of Clinical Oncology

Grace Lee - Practitioner of the Year Award, Ontario Association of Medical Radiation Sciences

Natasha Leighl — Excellence in Teaching Award, American Society of Clinical Oncology

Lothar Lilge - Lifetime Achievement Award, International Photodynamic Association

Fei-Fei Liu - Fellow of the American Society for Radiation Oncology, American Society for Radiation Oncology

Benjamin Lok – William C. Rippe Award for Distinguished Research in Lung Cancer, Lung Cancer Research Foundation

Tak Mak — Gold Leaf Prize for Discovery, Canadian Institutes of Health Research

Tak Mak – Member of Academia Europaea

Tak Mak – Weinman Award, Weinman Foundation for Innovation

Andrea McNiven - Innovation in Medical Physics Education Award, American Association of Physicists in Medicine

Frances Shepherd – Women of Action Award, Israel Cancer Research Fund

lan Tannock – Allen S. Lichter Visionary Leader Award, American Society of Clinical Oncology

Camilla Zimmermann – Eduardo Bruera Award in Palliative Medicine, Canadian Society of Palliative Care Physicians

Leadership

Cancer Executive Committee

Mary Gospodarowicz (Chair) - Medical Director

Nazek Abdelmutti - Senior Manager, Cancer Strategy Stewardship

Alexandra Boasie - Director (Acting), Regional Cancer Program

Judy Costello - Senior Clinical Director, Malignant Hematology &

Blood Disorder Program

Marnie Escaf - Senior Vice President, UHN Executive Lead

Meredith Giuliani - Medical Director, Cancer Education

Fei-Fei Liu - Head, Radiation Medicine Program

Meena Merali - Director, Cancer Strategy Stewardship

Amit Oza - Head, Medical Oncology and Hematology

Gary Rodin - Head, Supportive Care

Anet Julius - Director, Professional Practice

Lesley Moody - Clinical Director, Solid Tumour & Ambulatory Clinics

Karen Yee - Chair, Cancer Committee

Gelareh Zadeh - Head, Surgical Oncology

Senior Management Team

 $\textbf{Marnie Escaf} \ (\textbf{Chair}) \ - \ \textbf{Senior Vice President}, \ \textbf{Executive Lead}$

Paul Cornacchione - Senior Director, Imaging Operations

Judy Costello - Senior Clinical Director, Malignant Hematology &

Blood Disorder Program

Colleen Dickie - Director, Radiation Medicine Program

Olavo Fernandes - Director, Pharmacy - Clinical Operations

Alex Radkewycz - Senior Public Affairs Advisor

Zsolt Hering - Director, Finance

Terra lerasts - Site Manager, Digital

Natasha Kuzmanov - Director, Human Resources

Ashley Liu - Manager, Strategic Projects

Anet Julius - Director, Professional Practice

Lesley Moody - Clinical Director, Solid Tumour & Ambulatory Clinics

Disease Site Group Leaders

Karen Yee (Chair, Cancer Committee) - Leukemia

Laura Dawson - Upper Gastrointestinal

Marc De Perrot - Lung

Peter Ferguson - Sarcoma

Antonio Finelli - Genitourinary

David Goldstein - Endocrine

Danny Ghazarian - Skin/Melanoma

Anne Koch - Breast

Normand Laperriere - Central Nervous System & Eye

Stephanie L'heureux - Gynecology

Anca Prica - Lymphoma/Myeloma

Sami Chadi - Lower Gastrointestinal

John Waldron - Head and Neck

BUILDING THE VISION TO ENABLE

FUTURE CARE NOW



This past year has been one of strategic renewal for our organization, driven by new leadership and our unwavering commitment to elevate the impact our donors have supporting research, education and patient care. Aligned with the Cancer Centre's new strategy, Future Care Now: Create Cancer Care 2030, and UHN's vision for A Healthier World, our Foundation launched a bold new vision to elevate the impact our donors have on this next frontier of progress.

Future Care Now is our commitment to deliver the very best treatments available today, while also focusing on accelerating the cancer research and breakthroughs of tomorrow. We know that by striving to create Future Care Now at The Princess Margaret and across our vast global network, we will, with the help of our generous donors, Conquer Cancer In Our Lifetime.

This year we challenged ourselves last year to rethink our role in building Future Care Now by developing an ambitious new strategic plan titled Strategic Plan 2025: The Roadmap to Enabling Future Care Now. The process was fuelled by over 200 stakeholders, including team members, donors, clinicians, thought leaders and industry experts. We sought to be revolutionary — not evolutionary — in our approach.

This detailed strategic plan will serve as a roadmap to increase fundraising that will expedite the groundbreaking

research done at the Princess Margaret. It will help us strengthen the impact that each donation has in the fight against cancer, and will help us deliver on our aspiration to be Canada's most respected charitable foundation where people want to donate, work, and volunteer.

A gift to The Princess Margaret is the most impactful way to support patients, care teams and researchers in their dream of a future without cancer. After all, the research and cancer care from The Princess Margaret doesn't just stay in Toronto – or even Canada. It has a ripple effect and impacts cancer patients, professionals and researchers around the world. Our research team is part of a global network that includes scientists and clinicians from over 200 different institutions in over 30 countries. Each year, we attract over 70 international medical trainees who come to The Princess Margaret to learn from our internationally recognized scientists, clinicians, and faculty.

It takes a community to create leading-edge research and clinical care, and we are grateful for the generous support of our volunteers, donors, and community members. We want to thank them all for helping to enable Future Care Now for patients at The Princess Margaret, across Canada, and around the world.

The Princess Margaret's Global Network of Impact





ThePrincessMargaret.ca

