

# 2024-2025 Annual Report

## Radiation Medicine Program



**UHN**

Princess  
Margaret  
Cancer Centre



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# Message from the Head

It is an honour to lead the Radiation Medicine Program (RMP) at the Princess Margaret Cancer Centre (PM) as Head of RMP and Head of Radiation Oncology at University Health Network (UHN). I extend my deepest gratitude to Team RMP for their unwavering dedication to delivering exceptional patient care. I also want to thank our department leaders whose collaboration has been instrumental in our success, including **Yat Tsang**, (Director of Radiation Therapy), **Jan Seuntjens** (Head of Medical Physics), and **Colleen Dickie** (Director of Operations). Together, we lead a dynamic and talented multidisciplinary team of radiation oncologists, medical physicists, radiation therapists, nursing, allied health, administrative, and support staff.

This annual report celebrates RMP's achievements in clinical care, research, and education throughout the year. Since launching our Strategic Roadmap to 2026—Revolutionizing Radiation Care through Digital Health—we have made significant strides toward our shared vision: Precision Radiation Medicine. Personalized Care. Global

Impact. As we begin planning for our next strategic priorities, the milestones highlighted from the 2024-2025 fiscal year reflect our continued commitment to innovation and excellence.

RMP remains one of the largest single-site radiation medicine programs in the world, providing 9,756 new patient consultations and delivering 7,880 protocol instances this year. It is a privilege to collaborate with our talented multidisciplinary team, leveraging cutting-edge technology to care for cancer patients. With the implementation of Ethos for online adaptive treatment, we reaffirm our commitment to transforming patient care through technological advancement and the development of comprehensive programs in particle therapy and theranostics. Special thanks to **Rebecca Wong** for leading our efforts to expand theranostics at PM through her role as Co-Director of the new Silber Family Theranostics Centre, alongside Drs. Patrick Veit-Haibach and Luke Brzozowski from UHN.

Our team continues to lead pioneering research in adaptive radiotherapy and precision medicine. In 2024-2025, RMP investigators secured competitive funding from CIHR,



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**Across clinical care, research, and education, our team continues to set new standards and shape the future of radiation medicine.**

*– Dr. David Kirsch*

NSERC, CCS, and the Brain Tumour Foundation. Notable projects include: Advancing high-grade glioma diagnostics: Harnessing novel techniques in cf-DNA technology (PI **Scott Bratman**), Pattern recognition receptors drive a networked cellular signaling system during cancer therapy (PI **Shane Harding**), Reirradiation Practices of Radiation Therapists (RePoRT) (PI **Michael Velec**), Med-ImageNet: open-source medical imaging data curation for large-scale AI (PI **Andrew Hope**), XevaDB: A cloud-based platform for open sharing of large-scale pharmacogenomics profiles of patient-derived xenografts for precision oncology (PI **Benjamin Haibe-Kains**), Generative adversarial networks for MRI-driven radiation therapy (PI **Teodor Stanescu** and Co-PI **Ali Hosni**), Targeting of PPAR signaling to treat cancer-related lymphedema (PI **Jennifer Kwan**), Investigating the mechanism of arginine methyltransferase PRMT1 in regulating mRNA splicing and as a therapeutic target against small cell lung cancer (PI **Benjamin Lok**), Prediction and prevention of vaginal morbidity and female sexual dysfunction after pelvic radiotherapy (PI **Monica Serban** and Co-PI **Michael Milosevic**), and Hypoxia-associated multiomic changes in soft tissue sarcomas (PI **David Shultz**).

Team RMP was also recognized with prestigious awards and appointments. **Andrea Bezjak** was named a Fellow of the American Society for Radiation Oncology (ASTRO) and received the James D. Cox Lectureship Award. **Rachel Glicksman** received the 2024 Canadian Association of Radiation Oncology (CARO) Best Abstract in Clinical and Population-Based Oncology. **Amanda Moreira** was awarded the ESTRO TipsRO Young Researcher Award, and **Scott Bratman** and **Danielle Rodin** were both awarded the OARO Clinician-Scientist Distinction. Additionally, **Jennifer Kwan** and **Danielle Rodin** received Hold'em for Life Oncology Early Career Professorships. **Alejandro Berlin** received the Cancer Care Ontario Quality and Innovation Award for Digital Triage.

RMP's innovative education programs continue to set global standards in training. In 2024-2025, the Accelerated Education Program (AEP) completed its 12th Accelerator Technology Education Course. Across all AEP courses,

RMP hosted 71 international observers from 16 countries, alongside our talented colleagues and trainees. By training a diverse group of professionals and students, we are advancing global cancer education and care and improving outcomes worldwide.

## Looking Ahead

This report is a testament to the dedication, expertise, and collective impact of Team RMP. Across clinical care, research, and education, our team continues to set new standards and shape the future of radiation medicine. It is a privilege to lead such an exceptional group of professionals, united by our shared mission: advancing exemplary radiation medicine through patient care, research, and education, in partnership with our patients and community.

As we move forward and plan our strategic actions on our roadmap to the future, we remain committed to innovation, collaboration, and excellence. With the rapid evolution of radiation medicine and the opportunities ahead, I am excited for what we will accomplish together. Thank you for your dedication and contributions to another outstanding year – let's keep the momentum going and build on our success in the years to come.

Warm regards,



**David Kirsch, MD, PhD, FASTRO, FAAAS**

Head, Radiation Medicine Program, Princess Margaret Cancer Centre

Head, Department of Radiation Oncology, University Health Network

# Program Overview

RMP is the largest radiation treatment centre in Canada and recognized internationally for its excellence. RMP is structured around three core disciplines: radiation oncology, medical physics, and radiation therapy. Each is supported by strong clinical, research, administrative, and technical teams. Together, this multi-professional group of almost 400 staff work collectively to deliver high quality radiation treatment to over 6,760 cancer patients each year.

RMP has a diverse and highly skilled workforce, with many staff holding important leadership roles in patient-centered care, research, and education at the local, national, and international levels. Our research program spans biological and translational science, medical physics, clinical trials, health services, and education research, generating over 350 peer-reviewed publications annually and driving innovation in radiation medicine.

Our interdisciplinary environment facilitates the delivery of leading education programs covering the full spectrum of professional learning. RMP offers training at the undergraduate, graduate, postgraduate levels, as well as continuing medical education, through collaboration with the University of Toronto and Michener Institute of Education at UHN.

Our multi-talented, inter-professional staff enables all aspects of our program to succeed. Led by Program Head **Dr. David Kirsch**, the RMP Steering Committee defines the principles of operation and policies of governance for the management of clinical care, quality assurance and safety, research, educational, operational, and information technology activities.

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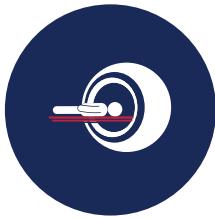
# VISION

Precision Radiation Medicine. Personalized Care. Global Impact.

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# MISSION

To advance exemplary radiation medicine through patient care, research, and education in partnership with our patients and community.



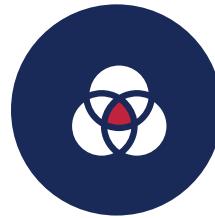
## CURE

Predictive Health  
& Adaptive  
Radiotherapy



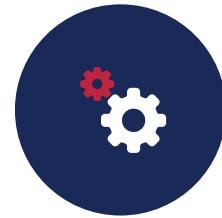
## COMFORT & CONFIDENCE

Technology-enabled  
Patient Experience  
Transformation



## EVOLVE

Advanced  
Particle Therapy  
& Theranostics



## CONNECT

Systems to  
Maximize Innovation  
& Wellbeing

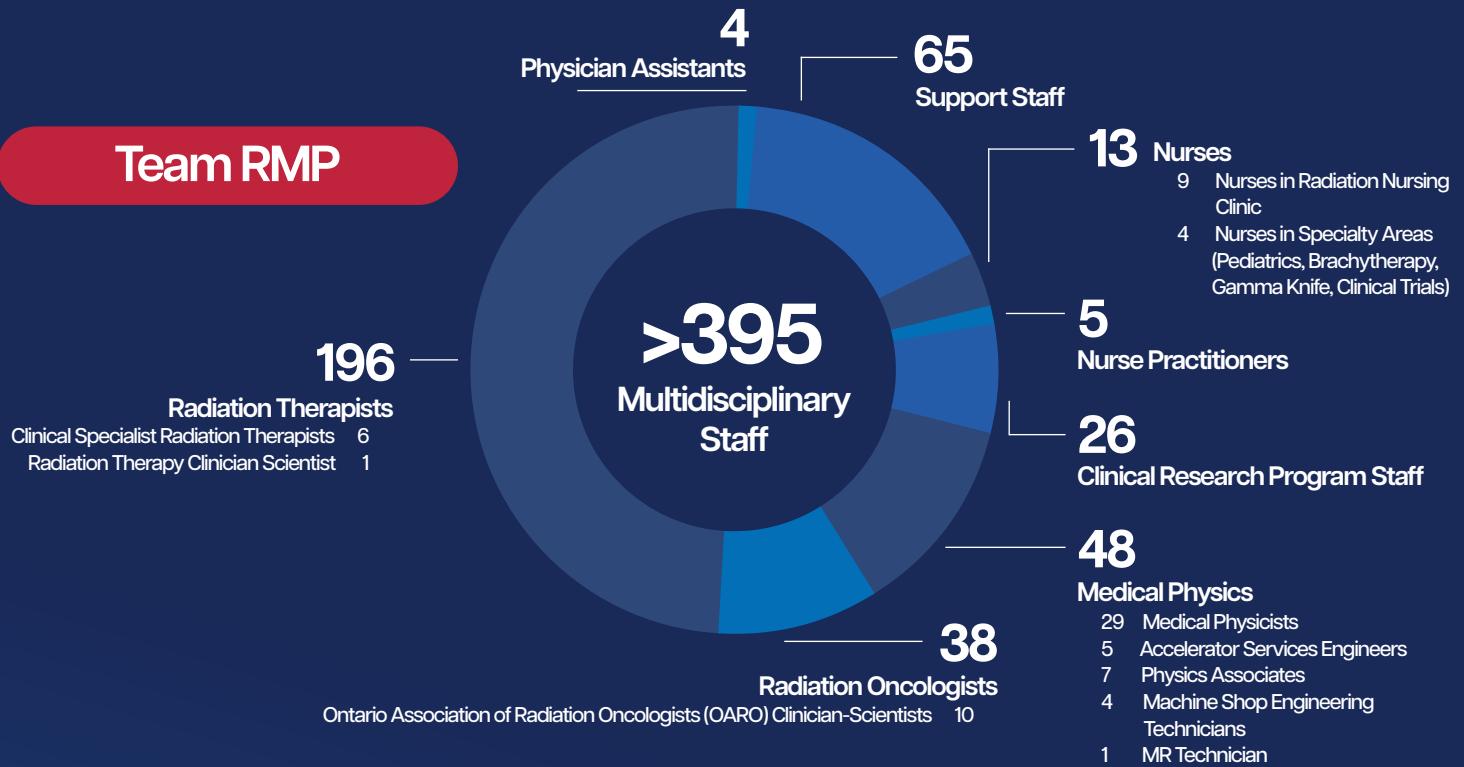
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# VALUES

Accountability   Excellence   Collaboration  
Innovation   Integrity

# Our Year in Numbers

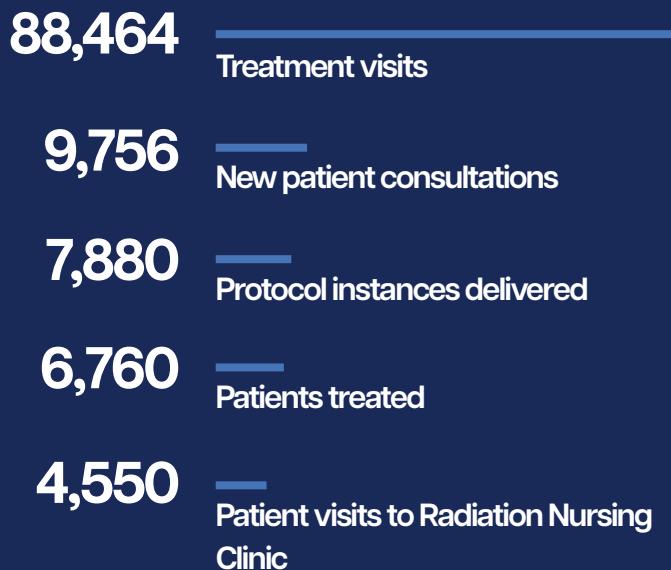
## Team RMP



## State-of-the-Art Facility

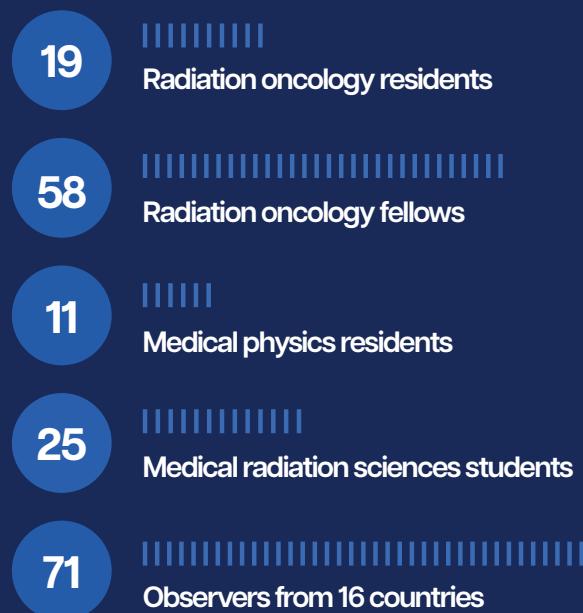
- |   |   |
|---|---|
| <b>13</b> Linear accelerators               | <b>1</b> Orthovoltage/Superficial X-ray unit                          |
| <b>2</b> Ethos Adaptive Linear Accelerators | <b>2</b> Brachytherapy high dose rate (HDR) remote afterloaders       |
| <b>1</b> Leksell Gamma Knife ESPRIT unit    | <b>1</b> Magnetic resonance-guided radiation therapy (MRgRT) facility |
| <b>1</b> Leksell Gamma Knife ICON unit      | <b>1</b> MR-Linac facility  |
| <b>4</b> CT simulators                      |   |
| <b>1</b> MRI 3T simulator                   |   |

## Clinical Care



Fiscal year statistics

## Education



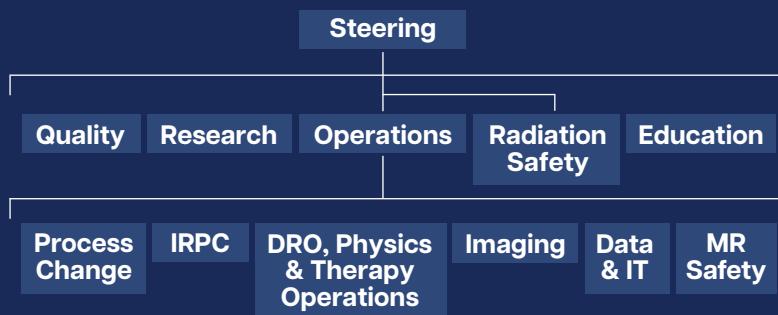
Academic year statistics

## Research



Calendar year statistics

## Governance



As of 2024

# Roadmap to 2026: A Year in Review

Since the launch of the **Strategic Roadmap to 2026** in 2021, RMP focused on implementing several key initiatives and activities in Year 4 to help achieve our four strategic priorities to:

1

**Empower predictive health and accelerate response-driven adaptive radiotherapy**

2

**Enhance personalized, equitable, compassionate care through a technology-enabled patient experience transformation**

3

**Establish a centre of excellence in advanced particle therapy and theranostics**

4

**Elevate systems to maximize innovation and well-being**

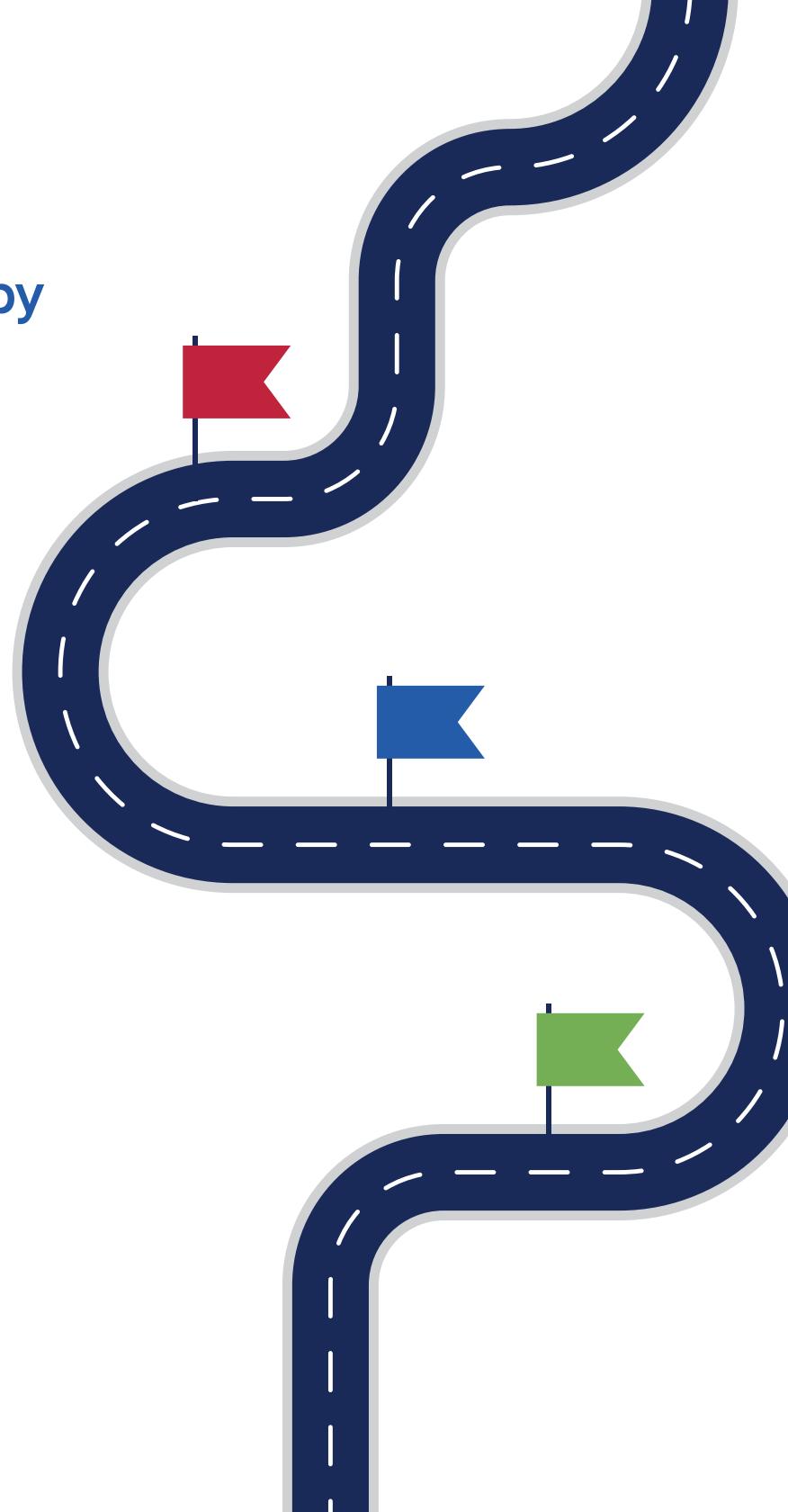
We extend our sincere thanks to **Dr. Keith Stewart**, who leads the Princess Margaret Cancer Centre, and **Miyo Yamashita**, who leads the Princess Margaret Cancer Foundation, with support for RMP provided by Connie Tsui, for their invaluable contributions in helping us to achieve our strategic goals. This year's key initiatives are outlined in the following pages.

# Proton/Particle Therapy

RMP continued its work towards planning Canada's first hospital-based proton/particle therapy centre, which is a collaboration between UHN, Ontario Health's Cancer Care Ontario, SickKids, and the Pediatric Oncology Group of Ontario (POGO).

Following the submission of the Stage 1.3 Functional Program to the Ontario Ministry of Health (MOH) on July 24, 2023, the team has continued to engage with the MOH Capital Branch and respond to comments regarding the submission. The last round of responses was submitted to the MOH in May 2025. During this time, the team has continued to stay abreast of technological advancements in proton and particle therapy. In particular, site visits were conducted in Europe and Asia, to observe particle therapy centres in operation. As well, the team has continued to consult with the project's External Advisory Board (EAB) and work with consultants to ensure that plans for the proposed facility are future-proof and are well-positioned to accommodate accelerator redundancy for uninterrupted treatment, 3D image-guidance and multi-ion capabilities.

The team is awaiting the approval of the Stage 1.3 Functional program by the MOH and approval to move to the next stage of planning – Stage 2.1 Detailed Design.



# Advances in Theranostics

UHN is advancing radiotheranostics, a cutting-edge radiation medicine that combines diagnostics with PET and radiation therapy to precisely target cancer. By using a single molecule equipped with either a radioisotope to image cancer or a different radioisotope to kill cancer cells, a theranostic agent targets radiation to detect and treat metastatic cancer.

Since founding CanProbe in 2011 to manufacture radiopharmaceuticals, UHN has been building its capacity for theranostics. Now, with the development of the Silber Family Theranostics Centre at Princess Margaret, the program is further expanding infrastructure, enhancing expertise, and streamlining patient care. This innovative centre harnesses the power of radioisotopes to both detect and treat cancer, offering a new approach to deliver radiation to metastatic cancer. By using a single molecular probe, clinicians can identify tumours through nuclear imaging and subsequently deliver targeted radiation therapy directly to those same areas.

By integrating nuclear medicine, imaging, medical physics, radiation oncology, medical oncology, radiation therapy, and health systems, theranostics allows RMP to collaborate with multiple disciplines to drive real-world impact in precision oncology, ensuring more patients benefit from the latest advancements in personalized cancer treatment.

The Theranostics Centre is co-led by **Dr. Rebecca Wong**, Radiation Oncologist and Clinician Scientist at RMP, as well as Dr. Patrick Veit-Haibach, Deputy Radiologist in Chief and Nuclear Medicine Physician at UHN, and Dr. Luke Brzozowski, Executive Director, Theranostics and Core Facilities UHN. RMP is proud to be able to help bring this important radiation medicine to our cancer patients in Ontario, allowing them to benefit from this highly promising treatment option.



# Clinical Care

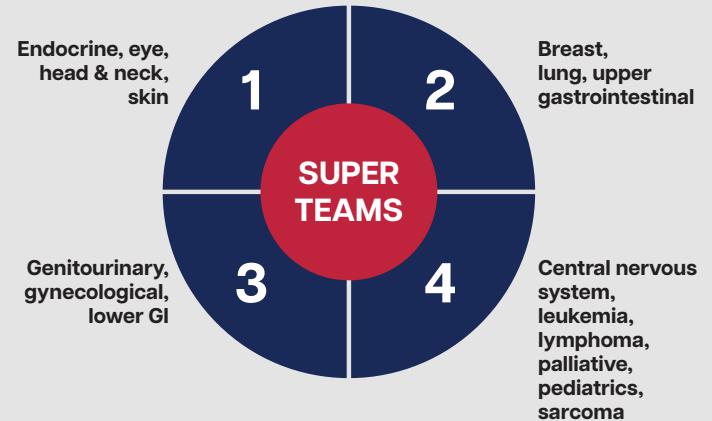
## Clinical Practice

Our clinical practice encompasses all aspects of cancer care – from diagnosis to survivorship. In 2024-2025, RMP provided 9,756 patient consultations and delivered 7,880 protocol instances. As well, there were 4,550 visits to the Radiation Nursing Clinic (RNC) for symptom and side effect management. In total, RMP had 88,464 patient treatment visits.

Our clinical practice is integrated into four multi-disciplinary Super Teams comprised of anatomically related tumour site groups. Standardized treatment protocols that relate to evidence-based disease management guidelines are used by each site group to plan and treat patients. In addition to site groups, several specialized programs exist to further support individualized care in a subset of patients. Together, our inter-professional team works collaboratively to assess, plan, and deliver personalized care to our patients.

## Quality and Safety

Quality and Safety at RMP is paramount and is overseen by multidisciplinary leads who function to monitor, analyze, report, and make recommendations on all aspects of radiation treatment quality and safety within RMP. This structure is part of the Princess Margaret Cancer Centre's and UHN's commitment to quality and accountability. At RMP, we aim to exceed national and international safety standards, managing a quality-monitoring program for the department covering the following four domains:



### SPECIALIZED PROGRAMS

**Brachytherapy**  
**Gamma Knife Radiosurgery**  
**Palliative Radiotherapy and Oligometastasis**  
**Pediatric Radiation Therapy**  
**Stereotactic Radiation Therapy**

- 1. Performance Indicators:** aimed at evaluating compliance with relevant standards
- 2. Quality Assurance:** aimed at monitoring radiation treatment quality control processes
- 3. Quality Education:** aimed at contributing to quality and safety competence through education
- 4. Incident Learning:** aimed at improving quality and safety through follow-up of reported events

# RMP Welcomes Ethos and HyperSight

In a groundbreaking achievement in 2024, PM became the first institution in Canada to install Varian TrueBeam units equipped with HyperSight imaging. This advanced technology enables the RMP team to visualize anatomical changes with the resolution that approaches a diagnostic CT scan prior to radiation treatment delivery. This facilitates real-time updates to radiation treatment plans during a course of therapy. HyperSight enhances the precision of image-guided radiation delivery.

The integration of HyperSight imaging into RMP reflects months of dedicated effort and collaboration across teams. Combined with the implementation of Ethos online adaptive technology, this positions PM to be a global leader in precise, personalized, and adaptive cancer care.

RMP further advanced its commitment to personalized care with the addition of Ethos. The journey with Ethos began in fall 2023 with equipment procurement and bunker renovations. Installation was completed in April

2024, and initial treatments commenced in June. Over the summer and fall, Ethos units were upgraded with HyperSight Advanced Imaging, paving the way for full adaptive radiotherapy. On February 4, 2025, RMP officially launched the Varian Ethos 2.0 Adaptive Radiation Therapy platform.

Ethos allows oncologists, physicists and radiation therapists to re-plan treatments according to the anatomy of the day, eliminating delays in a standard re-planning process that requires a new CT scan. In combination with HyperSight, radiation plans can now be generated in 15 minutes, which dramatically reduces planning time that previously took hours or days. This innovation may offer substantial benefits for patients, including reducing the risks of acute side effects and long-term toxicity.





This milestone was made possible by the tireless efforts of the RMP team. Following four months of intensive preparation, including physics commissioning, quality assurance, interprofessional workshops, training, and dry runs, the team ensured a seamless and safe roll-out for our first patients.

To date, patients with prostate, sarcoma, liver, gynecological, and head and neck cancers have received treatment

using Ethos. This cutting-edge technology marks a paradigm shift in radiotherapy, harnessing artificial intelligence to generate personalized treatment plans in minutes, which dramatically reduces traditional planning timelines. This investment in new technology marks a continued effort to advance personalized cancer care by delivering tailored treatments that give patients the best possible outcomes.

# Leadership Appointments



**Anthony Lausch** joined the Quality Committee in May 2025



**Fayaza (Fia) Syed** was promoted to DRO Administrative Team Lead, effective June 2024



**Benjamin Lok** was appointed as Lung Group Site Leader, succeeding Alexander Sun



**Zahra Rasoul** was promoted to DRO Administrative Team Lead, effective July 2024



**Nauman Malik** was appointed to the Head and Neck Site Group



**Pia Crisostomo** was promoted to Administrative Assistant III, effective November 2024



**Andrew Bayley** was appointed to the Head and Neck Site Group



**Jenn Permaul** was promoted to Administrative Assistant III, effective December 2024



**Jillian Tsai** was appointed to the Skin Site Group



**Jonathan Yee** was appointed to a permanent Administrative Assistant II role, effective January 2025



**Rebecca Wong** was appointed as the Inaugural Director of Theranostics at RMP



**Hillary Le** was appointed as RT Team Supervisor, effective June 2024



**Tatiana Ritchie** was appointed Clinical Specialist Radiation Therapists (CSRT), effective May 2024



**Michelle Truong** was appointed Gynecology Radiation Therapy Site Leader, effective June 2024



**Maureen Savage** was appointed Patient Flow Coordinator (PFC) Administrative Team Lead, effective May 2024



**Grace Tsui** was appointed Radiation Therapy Pediatric Site Leader, effective June 2024



**Alana Pellizzari** was appointed as Radiation Therapy Team 2 Reference Planner, April 2024



**Ruti Shahin** was appointed Administrative Assistant Level II, effective January 2025



**Lise Siu-Chong** was appointed Team 1 Reference Planner, effective July 2024



**Vanessa Wan** was appointed Radiation Therapy Lymphoma Site Lead, effective March 2025



**Mary Grossutti** was appointed Senior Manager, Program Strategy and Development, effective August 2024



**Julie Duong** was appointed as Radiation Therapy GU Site Leader, effective March 2025



**Ting Jun Zhang** was appointed Physics Associate III (Senior Physics Associate), effective August 2024



**Shima Marand** was appointed Interim Team Lead for Administrative Services in Medical Physics, effective November 2024

# Education

As one of the largest radiation medicine programs in North America, RMP offers one of the most comprehensive clinical environments for the formal training of radiation oncologists, medical physicists, and radiation therapists. RMP's education portfolio is closely integrated with the University of Toronto Department of Radiation Oncology (UTDRO), reflecting our environment in a fully affiliated teaching hospital of the Temerty Faculty of Medicine. This strategic alignment enables optimal use of educational expertise and infrastructure, supporting the shared mandate to advance excellence in radiation medicine education.

RMP's formal professional training programs span from undergraduate to post-graduate level, including **Undergraduate training for radiation therapy** (BSc Medical Radiation Sciences); **Post-graduate programs for radiation oncology residency, radiation oncology fellowship, and medical physics residency**; and the **Strategic Training in Transdisciplinary Radiation Science for the 21st Century (STARS21) Training Program**.

In addition, RMP faculty contribute to the education of residents and fellows from other programs, as well as graduate students from various University of Toronto departments, including the Institute of Health Policy, Management and Evaluation, Dalla Lana School of Public Health, Nursing, Institute of Medical Science, Institute of Biomaterials & Biomedical Engineering, Medical Biophysics, and the Factor-Inwentash Faculty of Social Work.

RMP also offers interdisciplinary continuing education for practicing professionals through several innovative programs, including the **RMP Observership Program**; the **Accelerated Education Program (AEP)**, which delivers

in-depth structured 2-3 day courses; and the **Personalized Learning Program™ (PLP™) in Radiation Medicine**, which offers 3-6 months of customized on-site and online learning opportunities.

## Diverse Learners

### UNDERGRADUATE

- 25** BSc Medical Radiation Sciences students
- 45** Undergraduate Medical Education students
- 3** CARO-CROF students
- 26** Summer students

### POST-GRADUATE

- 19** Radiation oncology residents
- 58** Radiation oncology fellows
- 11** Medical physics residents
- 24** STARS21 scholars

### CONTINUING EDUCATION

- 71** Observers from 16 countries
- 47** AEP participants
- 10** PLP participants



# Accelerated Education Program Delivers 12th ATec Course

From October 8-24, 2024, RMP and AEP teams delivered the twelfth AEP Accelerator Technology Education Course (ATec). First launched in 2011, ATec remains the gold standard in accelerator training for physics associates, accelerator service engineers, and physics residents. It is now mandated training requirement for select new staff at the Canadian Nuclear Safety Commission.

Course Directors **Bern Norrlinger** and **Patricia Lindsay** oversaw this hybrid course, which includes virtual preparatory sessions and three days of intense onsite training. Expert instruction was provided by **Andrew Currell**,

**Makan Farrokhkish, Rob Heaton, Carlos Varon, Jeff Winter, and Raanan Marants.** We also thank our guest faculty member Mark Ruschin and RMP contributors **Ivan Yeung, Mike Milosevic, Ed Taylor, and Leigh Conroy** for their valuable participation.



# Excellence in Teaching: Celebrating Our Educators

RMP is proud to recognize RMP staff for their outstanding commitment to education and mentorship. Their excellence in teaching was honoured with University of Toronto Awards, celebrating their dedication to training the next generation of clinicians and researchers. Congratulations to all recipients on their well-deserved achievements!

**Wendy Flanagan** received the Wightman-Berris Academy Individual Teaching Excellence Award in the Health Profession Programs category for 2023-2024. This award recognizes exemplary educators who are nominated by their students, reflecting Wendy's outstanding dedication and exceptional contributions to learners' education.



RMP congratulates all recipients of the UTDR0 (University of Toronto Department of Radiation Oncology) Awards:

- **Andrea Bezjak:** Cummings Education Leadership Award
- **Jennifer Dang:** MRS Program - Excellence in Classroom Teaching
- **Barbara-Ann Millar:** Undergraduate Medical Education – Outstanding Contribution to the Program
- **Derek Tsang:** Undergraduate Medical Education – Best Clinical Teaching
- **Sophie Huang:** Postgraduate Medical Education – Excellence in Research Supervision
- **Leigh Conroy:** Postgraduate Medical Education – Excellence in Research Supervision
- **Jillian Tsai:** Postgraduate Medical Education – Classroom Teaching Award
- **Scott Bratman:** Clinical and Experimental Radiobiology Course – Excellence in Radiobiology Education Award
- **Kathy Han:** Excellence in Research Leadership
- **Rachel Glicksman:** Rising Star for Outstanding Research Potential

*\*only RMP awardees listed*

# 2024 Princess Margaret Cancer Education Program Awards

On October 28, 2024, PM held its annual Cancer Education Awards which recognized healthcare staff for their achievements and contributions to patient care, innovation in treatment, support of cancer programs, as well as the display of extraordinary compassion and advocacy.

Congratulations to RMP staff **Andrea Bezjak**, **George Li**, **Jane Tsai**, **Jennifer Croke**, and **Neva Pang** for their awards and their dedication to cancer education, innovation, and patient care.

- **Andrea Bezjak**: Outstanding Contribution to Cancer Care Award
- **George Li**: Robert V. Brady Award
- **Jane Tsai**: Excellence in Education Support Award
- **Jennifer Croke**: Excellence in Mentorship Award
- **Neva Pang**: Video Award



# STARS21 Training Program

The Strategic Training in Transdisciplinary Radiation Science for the 21st Century (STARS21) program officially relaunched on October 8, 2024, continuing the legacy of the former Excellence in Radiation Research for the 21st Century (EIRR21) program. Led by Program Directors **Anne Koch, Shane Harding**, alongside Program Coordinator **Gregory Ashman**, STARS21 builds on a strong foundation of training future leaders in radiation medicine research by fostering leadership, collaboration, and communication capabilities.

Running until May 2025, the program supported a cohort of 13 graduate students, six clinical trainees, and two alumni scholars, with 13 invited scholars from leading institutions worldwide, including the Manchester

Center for Cancer Research in the UK, the University of British Columbia, and the University of Duisburg Essen in Germany. STARS21 has a multidisciplinary curriculum, support by RMP faculty with expertise in biology, genomics, pharmacology, medical physics, and radiation oncology. The program equips trainees with the skills needed to conduct innovative translational research. With support from multiple agencies and corporate sponsors, STARS21 continues to prepare the next generation of leaders in radiation medicine.

We look forward to welcoming future cohorts and continue to grow this exciting program.

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**This is by far the best program that I have been a part of in my graduate studies. I really enjoyed how much I was able to learn in such a short period of time. As someone who wants to end up in a career in radiation medicine it was great to interact with peers who have the same goals and mindset and gain insight from established experts in the field.**

– STARS21 Scholar

# RMP Welcomes Summer Students



RMP was pleased to host another successful year of the RMP Summer Student Program. In 2024, the program welcomed 26 students, ranging from undergraduate to doctoral levels. Throughout the summer, these students collaborated with RMP staff and faculty on a variety of research projects, culminating in high-quality capstone presentations during Research Day on August 19, 2024. This event provided students with the opportunity to present their work to peers, supervisors, and RMP Education Director **Rebecca Wong**.

Participants described the program as a valuable hands-on learning experience, enriched by mentorship and professional development opportunities. We extend our thanks to the students, as well as our interdisciplinary faculty and staff for their guidance and support. Special thank you to RMP's Summer Student Program Director Rebecca Wong, Program Coordinator **Jane Tsai**, as well as **Fayaza Syed** and **Marcia Bowen** for their administrative support.



**Learning and observing what cancer care looks like on paper and in practice helped motivate me to dig deeper into my interest in public health and reflect on how I can make an impact on the lives of others through my research.**

*– RMP Summer Student*

# Leadership Appointments



**Michael Yan:** Appointed UME Associate Director, effective April 2025



**Kieng Tan:** Appointed as Director of the Medical Radiation Sciences Program at UTDRO, effective January 2025

# Academic Appointments



**Catherine Coolens:** Promoted to rank of Professor at UTDRO (July 2024)



**Danielle Rodin:** Promoted to rank of Associate Professor at UTDRO (July 2024)



**Jennifer Croke:** Promoted to rank of Associate Professor at UTDRO (July 2024)



**Teodor Stanescu:** Promoted to rank of Associate Professor at UTDRO (July 2024)



**Benjamin Lok:** Promoted to rank of Associate Professor at UTDRO (July 2024)



**Anthony Fyles:** Emeritus Professor at UTDRO (May 2024)



**Alexandra Rink:** Promoted to rank of Associate Professor at UTDRO (July 2024)

# Research

RMP continues to transform the radiation treatment landscape through pioneering research, advancing discovery across radiation oncology, radiobiology, medical physics, and radiation therapy. This research drives innovation and shapes practice both locally and globally.

In FY2024–25, our investigators secured over \$42 million in external research funding, including support from agencies such as the Canadian Institutes of Health Research (CIHR), Natural Sciences and Engineering Research Council of Canada (NSERC), and the Terry Fox Research Institute. Our team published more than 350 peer-reviewed articles in leading journals, with many publications led by more than one discipline, reflecting the truly multidisciplinary nature of our research.

This year, our research was propelled by several key initiatives. The Varian Seed Grant Program, developed in partnership with RMP, facilitated interdisciplinary research in adaptive radiotherapy using cutting-edge platforms such as Ethos and HyperSight.

Our Clinical Research Program (CRP) provided oversight for nearly 250 active studies led or co-led by RMP investigators, ensuring that new insights are rapidly and rigorously tested in the clinical setting. Collaboration across disciplines remained a cornerstone of our approach, enabling breakthroughs at the intersection of medicine, biology, physics, and technology.

Looking ahead, RMP remains steadfast in its mission to redefine what is possible in radiation medicine - building evidence, fostering innovation, and improving outcomes for patients.

## Novel Discoveries

42

**Million dollars in peer-reviewed funding**

172

**Peer-reviewed grants**

366

**Peer-reviewed publications**

246

**Active clinical studies**

58

**Active prospective clinical studies**

8.7

**Percentage of new patients accrued to prospective clinical studies**

# Notable Publications

## Pembrolizumab Boosts Disease-Free Survival In High-Risk Extremity Sarcoma



**David Kirsch** and colleagues published an international phase II clinical trial in *The Lancet*<sup>i</sup> testing whether adding pembrolizumab to standard preoperative radiotherapy and surgery could improve outcomes for patients with high-risk soft tissue sarcoma of the extremities. The study showed a 15% improvement in 2-year disease-free survival with pembrolizumab, suggesting it could become a valuable new component of treatment.

## New Classification System Improves Depiction of Severe Jaw Damage After Radiation



Published in *Journal of Clinical Oncology*<sup>ii</sup>, **Ali Hosni** and colleagues analyzed over 2,700 head and neck cancer patients treated with IMRT to identify risk factors for osteoradionecrosis (ORN) and develop

a new classification system, “ClinRad”, to better assess its severity. ClinRad outperformed 15 existing systems in depicting the severity of ORN and may enhance both clinical decision-making and trial design.

## SBRT Shows Promise in Improving Outcomes for Advanced Liver Cancer



In this multicentre phase 3 trial published in *JAMA Oncology*<sup>iii</sup>, **Laura Dawson** and colleagues evaluated whether adding SBRT to sorafenib improves outcomes for patients with locally advanced hepato-

cellular carcinoma. SBRT significantly improved progression-free survival and showed a trend toward better overall survival and quality of life, suggesting a meaningful clinical benefit.

## PARPi Radiosensitization Enhances Immunotherapy Response in Small Cell Lung Cancer



Published in *Nat Communications*<sup>iv</sup>, **Benjamin Lok** and colleagues demonstrated in a preclinical study that combining PARP inhibitors with radiotherapy enhances immune activation in

small cell lung cancer by increasing chemokine expression and T cell infiltration, overcoming a key barrier to immunotherapy response. Adding anti-PD-L1 immunotherapy further amplified anti-tumour effects, supporting a promising new combination strategy for this traditionally treatment-resistant cancer.

## Transfer Learning Improves OAR Segmentation Accuracy in Cervical Brachytherapy



**Alexandra Rink** and colleagues demonstrated that transfer learning significantly improves the performance and adaptability of deep learning models for auto-segmentation of OAR in MR-guided

cervical brachytherapy. Published in *Radiotherapy & Oncology*<sup>v</sup>, the study showed that fine-tuning with just a few scans enhanced accuracy across different settings, suggesting a practical path toward robust, time-efficient clinical implementation of AI tools.

## Polarimetric Imaging Enhances Precision of Breast Tissue Mass Spectrometry



Published in *Scientific Reports*<sup>vi</sup>, **Alex Vitkin** and colleagues demonstrated that polarimetric imaging can guide pico-second infrared laser mass spectrometry (PIRL-MS) to avoid fat-rich areas in breast tissue, reducing signal contamination and analysis time. The hybrid approach enabled the detection of key cancer markers with improved efficiency, highlighting its potential for more accurate and targeted tissue analysis in clinical settings.

## Physical Validation Confirms Accuracy of Dynamic Gamma Knife Treatments



**Catherine Coolens** and colleagues performed a dynamic dosimetric validation of Gamma Knife radiosurgery by using a motion phantom to replicate complex treatment motions, confirming that dynamic dose delivery matches planned doses with high precision. Published in *Medical Physics*<sup>vii</sup>, the findings support prior simulations and recommend a 2-mm discretization for efficient, accurate planning, paving the way for broader clinical adoption of dynamic treatment workflows.

## New Guideline Aims to Accelerate Safe Adoption of AI in Radiation Therapy



**Michael Velec, Jan Seuntjens** and colleagues representing ESTRO and AAPM developed a comprehensive guideline to support the development, validation, and reporting of AI models in radiation therapy, addressing key areas such as treatment planning, outcome prediction, and ethics. Published in *Radiotherapy & Oncology*<sup>viii</sup>, the guideline aims to foster transparency and consistency, ultimately helping bridge the gap between AI research and clinical implementation.



## Image-Detected Extranodal Extension Improves Prognostic Accuracy in Head and Neck Cancer



Published in *Oral Oncology*<sup>ix</sup>, **Sophie Huang** and colleagues demonstrated that image-detected extranodal extension (iENE) on baseline CT/MRI was associated with a more aggressive phenotype of laryngo-hypopharyngeal carcinoma, characterized by larger and more extensive LNs. The findings suggest iENE provides valuable prognostic information beyond current TNM staging and may warrant inclusion in future nodal classification systems.

## Pan-Canadian Survey of Adaptive Radiation Therapy and the Expanding Role of Radiation Therapists



**Amanda Moreira, Winnie Li** and colleagues conducted a national survey across 32 Canadian cancer centres and found that 78% have implemented adaptive radiation therapy (ART), predominantly offline, with 5 centres adopting online ART workflows. Published in *Technical Innovations & Patient Support in Radiation Oncology*<sup>x</sup>, they further demonstrated that Radiation Therapists



now shoulder roughly half or more of ART-related duties, highlighting the need for the therapists' role to be redefined with corresponding upskilling.

## Virtual Twinning Program Strengthens Radiotherapy Capacity in Ethiopia



**Nicole Harnett, Rebecca Wong** and colleagues led a virtual professional development initiative between Princess Margaret Cancer Centre and Tikur Anbessa Specialized Hospital to support workforce training in Ethiopia's expanding radiotherapy program. Published in *Technical Innovations & Patient Support in Radiation Oncology*<sup>xi</sup>, the organizers highlight the value of Low-Income



Country:High-Income Country twinning partnerships, which share strategies to enhance future impact through sustained collaboration and tailored educational support.

## Notable Peer-Reviewed Funding

**Scott Bratman:** Advancing high-grade glioma diagnostics: Harnessing novel techniques in cf-DNA technology. Brain Tumour Foundation of Canada.

**Shane Harding:** Pattern recognition receptors drive a networked cellular signaling system during cancer therapy. CIHR.

**Michael Velec:** Reirradiation Practices of Radiation Therapists (RePoRT). CAMRT.

**Andrew Hope:** Med-ImageNet: open-source medical imaging data curation for large-scale AI. Canadian Cancer Society.

**Benjamin Haibe-Kains:** XevaDB: A cloud-based platform for open sharing of large-scale pharmacogenomics profiles of patient-derived xenografts for precision oncology. Canadian Cancer Society.

**Ali Hosni and Teodor Stanescu:** Generative adversarial networks for MRI-driven radiation therapy. CIHR.

**David Kirsch:** Dissecting mechanisms of cancer development using genetically engineered mouse models. John R. Evans Leaders Fund (CFI-JELF). Canada Foundation for Innovation.

**Jennifer Kwan:** Targeting of PPAR signaling to treat cancer-related lymphedema. AACR-AstraZeneca.

**Benjamin Lok:** Investigating the mechanism of arginine methyltransferase PRMT1 in regulating mRNA splicing and as a therapeutic target against small cell lung cancer. CIHR.

**Benjamin Lok:** New approaches to immunotherapy for small cell lung cancer enabled by innovative cancer models. Ontario Ministry of Colleges and Universities.

**Monica Serban and Michael Milosevic:** Prediction and prevention of vaginal morbidity and female sexual dysfunction after pelvic radiotherapy. CIHR

**David Shultz:** Hypoxia-associated multiomic changes in soft tissue sarcomas. Cancer Research Society.

## Notable Awards and Distinctions



**Andrea Bezjak:** Fellow of the American Society for Radiation Oncology (ASTRO) (July 2024); International Association for the Study of Lung Cancer (IASLC) James D. Cox Lecture-ship Award for Radiation Oncology (September 2024)



**Danielle Rodin:** Ontario Association of Radiation Oncology (OARO) Clinician-Scientist Distinction (2024); Hold'em for Life Oncology Early Career Professors (July 2024)



**Rachel Glicksman:** Canadian Association of Radiation Oncology (CARO) 2024 Best Abstract in Clinical and Population-Based Oncology (September 2024)



**Jennifer Kwan:** Hold'em for Life Oncology Early Career Professors (July 2024)



**Amanda Moreira:** European Society for Radiotherapy and Oncology (ESTRO) tipsRO Young Researcher Award (May 2024)



**Alejandro Berlin:** Cancer Care Ontario (CCO) Quality and Innovation Awards – Digital Triage (September 2024)



**Scott Bratman:** Ontario Association of Radiation Oncology (OARO) Clinician-Scientist Distinction (2024)

# Team RMP

With a team of almost 400 radiation medicine professionals, RMP is fortunate to have a diverse pool of talent to help deliver on our vision of achieving our vision of Precision Radiation Medicine. Personalized Care. Global Impact. In 2024, RMP continued to exhibit excellence, innovation, and leadership in patient-centered care, research, and education, exemplified by the high level of productivity and achievements of our staff.

## Staff Spotlights



**Shao Hui (Sophie) Huang** received an American Head and Neck Society (AHNS) Presidential Citations invitation from their President Dr. William Lydiatt to attend the AHNS Annual Meeting at Combined Otolaryngology Spring Meetings (COSM) 2025. The AHNS is the single largest organization in North America for research and education in head and neck oncology advancement. The Society devotes its service to progressing research, education and equity and promoting optimal care for patients with head and neck neoplasms.



**Joanna Javor** received the Pamela Catton Award for Inter-Professional Education and Care. This award recognizes a faculty member or trainee who has demonstrated significant innovations in Inter-Professional Education and Clinical Care. Joanna received this award at the UTDR0 Alumni Reception at ASTRO 2024 in Washington, DC.



**Angela Alivio** was honoured by the City of Toronto on July 11, 2024 with a recognition award for years of community work helping newcomers in Toronto settle into the city by providing them with information and support on various services.



**Andrew Hope** was appointed as the Addie MacNaughton Chair in Thoracic Radiation Oncology for a five-year term. Andrew will follow in the footsteps of previous Chairholders **Alexander Sun** and **Andrea Bezjak** and will continue building a strong foundation of research in thoracic radiation oncology. Andrew is a Clinician Investigator within the RMP at the Princess Margaret Cancer Centre and Associate Professor in the Department of Radiation Oncology, University of Toronto. He specializes in the treatment of patients with thoracic malignancies and currently studies the impact of technology on improving patient outcomes, including artificial intelligence.



**Fayaza (Fia) Syed** was promoted to DRO Administrative Team Lead (Administrative Assistant II), effective June 3, 2024. Fia joined RMP in 2020 and has coordinated diverse programs, projects, and committees including the RMP Summer Student Program, DRO Payroll, the RMP Operations Committee, and the eSummit pilot project. Fia is currently co-leading a new attendance program initiative for RMP.



**Kathy Han** and her team received the Princess Margaret Agnico Eagle Early Detection Grand Challenge Award. This award recognizes and supports innovative projects in Early Detection – detecting cancers earlier and intercepting them while still curable. Their paper, “Clinical validation of human papilloma virus circulating tumour DNA for early detection of residual disease after chemoradiation in cervical cancer” aimed to validate HPV ctDNA as a tool for early detection of residual disease. They found that detection of HPV ctDNA following chemoradiation is significantly associated with higher risk of cancer recurrence in both locally advanced cervical cancer and oropharyngeal cancer.



**Zaynab Muraj** received a Bruce Power Seed Grant and presented at the Virtual Theranostics Forum on September 17, 2024. Zaynab’s presentation was titled “Patient-Focused Radiotheranostics: Understanding Clinical Pathways for Better Care.” This forum fostered collaboration and education in the rapidly evolving field of theranostics.



# Celebrating Team RMP

On January 21, 2025, RMP held its annual awards ceremony on the OPG 7th floor HIVE. This was an opportunity to celebrate the achievements and highlight the meaningful work of RMP staff.

## EDUCATION AWARDS

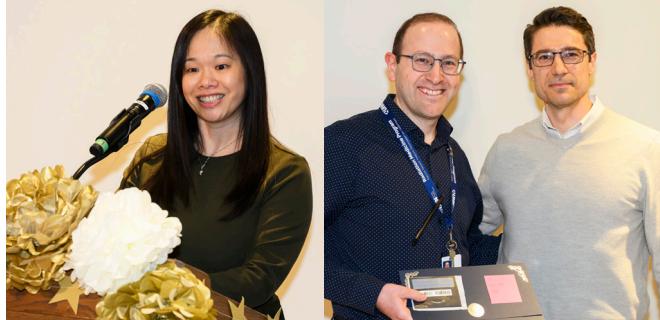
- Distinction in Professional Mentorship Award:  
**Anthony Lausch**
- Distinction in Teaching Award:  
**Jette Borg** and **Anne Di Tomasso**
- Trainee Excellence in Education Award:  
**Kara Ruicci** and **Revadhi Chelvarajah**
- Excellence in Education Support Award:  
**Makan Farrokhkish**
- Best RMP Rounds:  
**Leigh Conroy**
- Head's Choice for 2024 RMP Rounds Awards:  
**Andrew McPartlin**
- Highest Overall Teaching Effectiveness Score:  
**Jelena Lukovic**
- AEP "Putting Innovation to Work" Builder Award:  
**Laura Dawson, Tim Craig, Teodor Stanescu, Alana Pellizzari,** and **Andrea Shessel**

## RESEARCH AWARDS

- Research Leadership Award:  
**Mike Milosevic**
- Top Clinical Trial Accrual Investigator Award:  
**Philip Wong** and **Peter Chung**
- Exceptional Research Support Award:  
**Melissa Bartolo Rego, Azusa Maeda, Rachel Zhou,** and **Colin Robertson**
- Paper of the Year – Radiation Oncology:  
**Ezra Hahn**  
*Molecular Expression Assays Improve the Prediction of Local and Invasive Local Recurrence After Breast-Conserving Surgery for Ductal Carcinoma In Situ. Journal of Clinical Oncology. 2024 Sep 20;42(27):3196-3206.*
- Paper of the Year – Radiation Therapy:  
**Tatiana Ritchie**  
*Paediatric Radiation Therapy without Anaesthesia - Are the Children Moving? Radiotherapy & Oncology. 2024 Apr;193:110120.*
- Paper of the Year – Medical Physics:  
**Tony Tadic**  
*RADCURE: An Open-source Head and Neck Cancer CT Dataset for Clinical Radiation Therapy Insights. Medical Physics. 2024 Apr;51(4):3101-3109.*
- Collaborative Paper of the Year:  
**Winnie Li, Jeff Winter, Jennifer Dang, Alejandro Berlin, Charles Catton, Rachel Glicksman, Andrew McPartlin, Patricia Lindsay,** and **Peter Chung**  
*Practice-based training strategy for therapist-driven prostate MR-Linac adaptive radiotherapy. Technical Innovations & Patient Support in Radiation Oncology. 2023 May 13;27:100212.*

## CLINICAL AWARDS

- Excellence in Patient Care:  
**Michael Milosevic, Kayli Chen, and Amy (Yiping) Xu**
- Distinction in Technical Improvement:  
**Mary Grossutti, Odette Melvin, and Karen Tse**
- Exceptional Program Service:  
**Maureen Savage, Nick De Ocampo, Sebastian Koprowski, Nareesa Lalwah, Ferhat Ciftci, Tegist Woldie, Amina Warsame, K'Shania Frimpong, Charmaine Baniaga, Maria Cecilia Igot, and Savina Primi**
- Distinction in Quality & Process Improvement:  
**Colin Robertson and Tara Rosewall**



# New Talent

## RADIATION ONCOLOGY

- Andrew Bayley

## MEDICAL PHYSICS

- Hossein Afsharpour
- Ming Liu
- Oren Tal
- Daniel Micallef

## RADIATION THERAPY

- Yasir Walji
- Alvin Cuni
- Fiona Yuan
- Julie Duong
- Michael Sung
- Nikki Martin
- Hyeonsu (Judy) Ryu
- Katie (Chaehyon) Kim
- Hitaishi (Helly) Patel

## ADMINISTRATION/RESEARCH/OPERATIONS

- Gregory Ashman
- Jane DeRocchis
- Jonathan Yee
- Maria Cecilia (Maryecel) Igot
- Ivy Lin
- Patria Gianella Rosal
- Tatiana Boechat
- Sarah Escobar
- Sara Ekmen
- Nicole Kearse
- Yumi Kim
- Chrissia Tasic
- Teuta Zoto Mustafayev

## CLINICAL RESEARCH PROGRAM

- Mitali Shah
- Hesameddin Noroozi
- Laxmetha Eswaradas
- Priya Sriskandarajah
- Yoona Shin

# Sustained Service

Congratulations and thank you to our dedicated RMP members who have reached their ≥25-year service milestone in 2024.

## 25 YEARS

- **Marcia Bowen**
- **Monique Van Prooijen**
- **Colleen Dickie**
- **Vincent Ho**
- **Brian John**
- **Claudia Yin Man Chan**
- **Veng Chhin**
- **Lorella Divanbeigi**
- **Alana Pellizzari**

## 30 YEARS

- **Alex Vitkin**
- **Anne Di Tomasso**

## 35 YEARS

- **Elizabeth de Ocampo**



## Honouring a Lifetime of Achievement

From 2024-2025, RMP celebrated the well-deserved retirements of Director of Programming **Julie Wenz** (May 2024), Radiation Oncologist **Jolie Ringash** (June 2024), Clinical Educator **Angela Cashell** (July 2024), Medical Physicist **Jette Borg** (February 2025), and Radiation Therapist **Sherill Archer** (March 2025). Thank you for your many contributions to RMP.

# Fostering RMP Community

On December 6, 2024, RMP celebrated the end to a successful 2024 with a holiday party at Ricarda's Restaurant in Toronto. Program Head **David Kirsch** delivered a speech thanking colleagues for their hard work and important contributions to our success throughout the year. Afterwards, colleagues mingled over food and drinks before finishing the night on the dance floor. Many thanks to everyone who attended and **Gregory Ashman** and **Winnie Li** for organizing this festive event.

Thank you to all RMP for continuing to bring community spirit throughout the entire year, making RMP a special place to work.





# Acknowledgements

## Annual Report Contributors

Katie Wotherspoon  
Mary Grossutti  
Azusa Maeda  
Gregory Ashman  
Colleen Dickie  
David Kirsch  
RMP Steering Committee

## Photo Credits

Katie Wotherspoon  
RMP/RAD Team archives  
UHN Foundation

## Publication References (DOI)

- i. 10.1016/S0140-6736(24)01812-9
- ii. 10.1200/JCO.23.01951
- iii. 10.1001/jamaoncol.2024.5403
- iv. 10.1038/s41467-025-57257-z
- v. 10.1016/j.radonc.2024.110332
- vi. 10.1038/s41598-024-77963-w
- vii. 10.1002/mp.17034
- viii. 10.1016/j.radonc.2024.110345
- ix. 10.1016/j.oraloncology.2024.107007
- x. 10.1016/j.tipsro.2025.100303
- xi. 10.1016/j.tipsro.2024.100285

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