



CPQR
Canadian Partnership for
Quality Radiotherapy
PCQR
Partenariat canadien pour
la qualité en radiothérapie

www.cpqr.ca

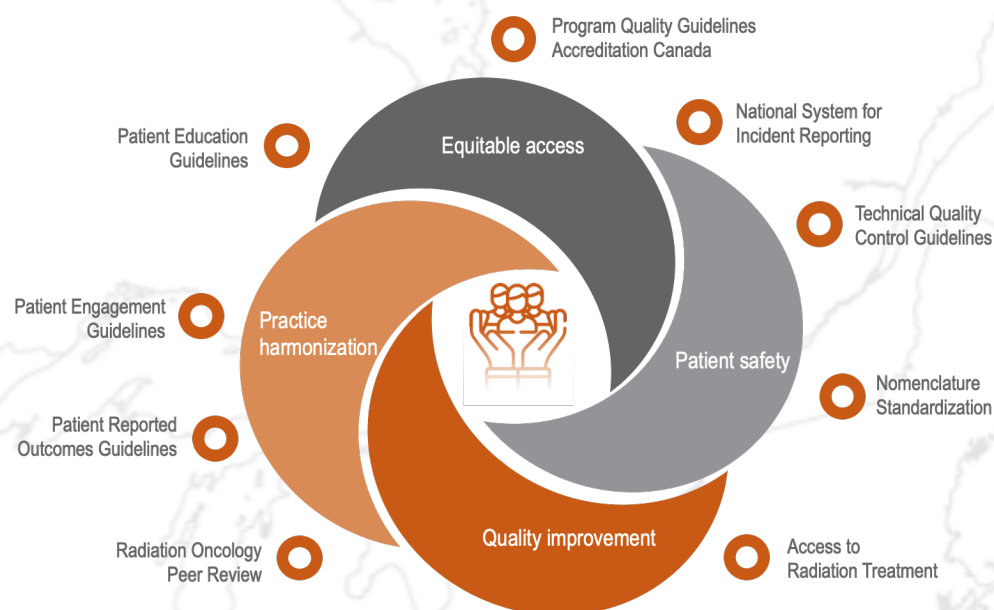
A Decade of Impact

The Canadian Partnership
for Quality Radiotherapy
2010 to 2021



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MESSAGE FROM THE CHAIR

Canada is home to one of the best cancer systems in the world and quality assurance has always been a high priority for Canadian radiation treatment programs. Historically, we lacked pan-Canadian harmonization of quality and safety practice, and a mechanism to translate best-practice between cancer centres and across jurisdictions.

The Canadian Partnership for Quality Radiotherapy (CPQR) was established in 2010 to address these gaps and enhance quality and safety practice in Canada. CPQR is a unique collaboration of radiation oncologists, medical physicists and radiation therapists working together with their respective professional associations and the Canadian Partnership Against Cancer (CPAC).

Born from a strong desire to ensure Canadians receive world-class cancer care, CPQR is now a world leader and trusted partner in quality improvement and safety initiatives for radiation treatment.

Our positive impact is a result of a grassroots model. It enabled us to improve radiation treatment planning and delivery through benchmarks for best practice, and to develop timely and practical tools for promoting harmonized practice and sharing knowledge.

One of our biggest contributions is a suite of more than 20 nationally validated, evidence-based guidelines that successfully harmonized safe radiotherapy delivery across Canada. Today the cornerstone of this work – the Quality Assurance Guidelines for Canadian Radiation Treatment Programs – is embedded in national hospital accreditation and serves as a roadmap for cancer programs as they continue to drive radiotherapy quality improvement locally and nationally.

CPQR is about to begin a new chapter. In 2021, CPQR will become a standing radiation treatment quality and safety committee within the Canadian Association of Provincial Cancer Agencies (CAPCA). By embedding CPQR into CAPCA, we will strengthen our pan-Canadian reach and enhance support to cancer programs and system partners across the country, while continuing to drive a harmonized approach to radiotherapy planning and delivery in Canada.

We are pleased to share this report with you to mark a decade of partnership and impact. On behalf of CPQR and our partners, thank you to the radiation treatment community for their engagement, expertise and leadership. A special thank you to CPAC for more than a decade of funding, and to our partners for significant in-kind investment.

Looking forward, CAPCA's new CPQR Committee will continue to bring value to our community and ensure that Canada remains at the forefront of radiation treatment planning and delivery.



**Mike Milosevic, MD
FRCPC**

Chair, Canadian
Partnership for Quality
Radiotherapy

"CPQR is the first successful Canadian health care system example where professionals from different disciplines work together as a team to improve the quality and safety of their practice."

– Health Systems Evaluator

REACHING FURTHER TOGETHER

C PQR's vision is to support and promote the universal availability of high-quality care for all Canadians through initiatives aimed at improving quality and mitigating risk.

Over the last decade, we have maintained a laser focus on improving radiation treatment quality and safety. We established benchmarks for best practice, developed timely and practical tools for promoting harmonized practice and shared knowledge on key aspects of quality and safety. Working with radiation treatment partners, we successfully created a national culture of collaboration by breaking down silos and driving change to improve patient care.

Our impact can be seen at the local, provincial, national and international levels:

- **Locally:** our technical quality guidelines serve as a model for equipment and software quality assurance and our tools are used by all radiation programs across Canada.
- **Provincially:** a common understanding of radiotherapy utilization rates paved the way for addressing barriers to people getting the care they need;
- **Nationwide:** programmatic harmonization is making it easier for us to learn how radiation treatment, and incidents are affecting populations of patients.
- **Internationally:** Canada is now a trusted world leader in radiotherapy quality and safety with our guidelines and tools used adapted for use in many countries.

These advances were made possible through generous funding by CPAC and in-kind support invested by our partners listed below. The commitment of our many partners is demonstrated by the fact that for every \$1 invested by CPAC, we have consistently secured an additional \$1.50 of in-kind investments from the radiation treatment community to support program development and implementation.

CPQR is a unique alliance of national professional cancer associations involved in the planning and delivery of radiation treatment in Canada. CPQR works with six key partner organizations in the planning and delivery of its programs:

- Canadian Association of Radiation Oncology (CARO)
- Canadian Organization of Medical Physicists (COMP)
- Canadian Association of Medical Radiation Technologists (CAMRT)
- Canadian Partnership Against Cancer (CPAC)
- Canadian Association of Provincial Cancer Agencies (CAPCA)
- Canadian Institute for Health Information (CIHI)

Since 2010, funding for CPQR has been provided by Health Canada through CPAC.

"CPQR's quality assurance guidelines provide a consistent national standard for radiation programs across the country and the self-audit tool allows us to compare our own results over time."

– Radiation Oncology Department Head

DRIVING QUALITY IMPROVEMENT

Like most cancer therapies, radiation treatment is becoming increasingly complex. An early focus of CPQR was the development of nationally validated key quality indicators set out in [Quality Assurance Guidelines for Canadian Radiation Treatment Programs](#) (QRT).

Released in 2011, these guidelines outline an overarching organizational structure and the processes required to assure high quality and safe radiotherapy and support a harmonized approach to quality improvement. Since the launch of this work, CPQR has supported radiation treatment programs across Canada to evaluate and measure their alignment with these indicators.

In 2017, CPQR partnered with Accreditation Canada to embed the indicators in all national hospital accreditation. Today, CPQR's Quality Assurance Guidelines are used by almost every radiation treatment program in Canada and are a benchmark in program quality improvement.

Version four of the guidelines was released in 2019 and reflects advances in radiotherapy practice including two new indicators on optimal staffing levels and peer review processes for palliative radiotherapy plans.

To ensure continued relevance and value to the community, CPQR released a [self-audit tool](#) in 2020 that allows centres to measure compliance and use real-time results to inform program improvements. Today these audit tools are incorporated into Radiotherapy Quality Assurance Committee business across the country.

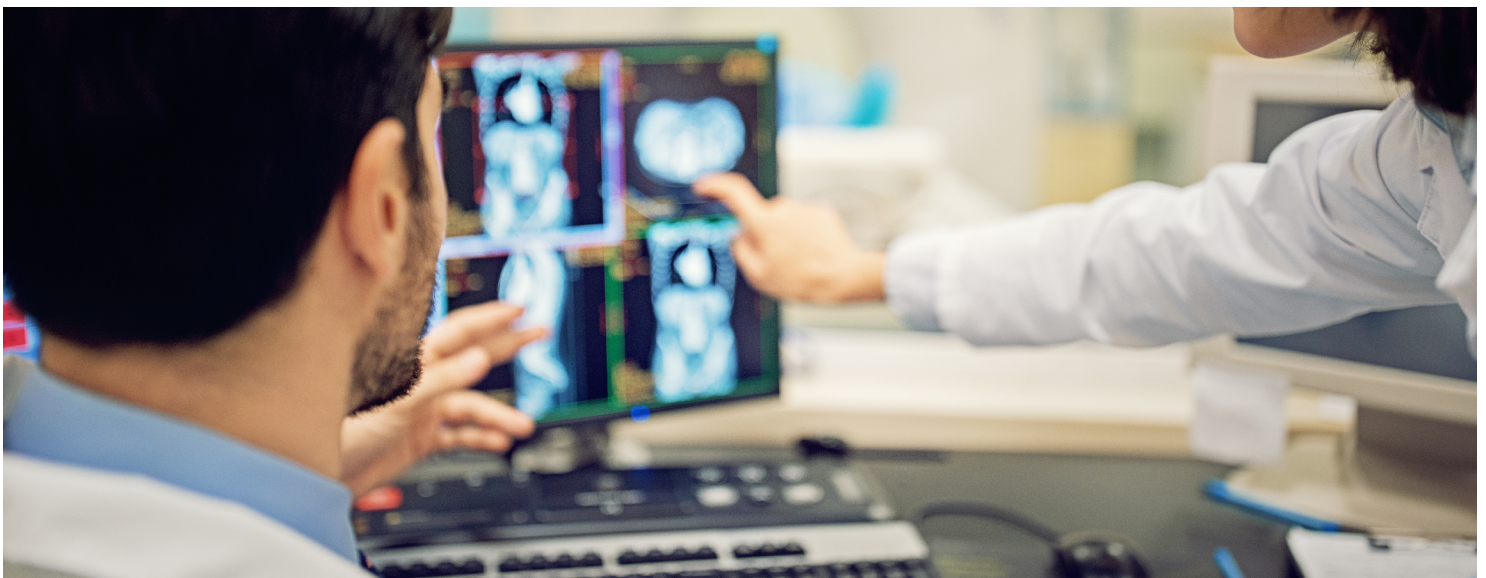
CPQR brings together radiation oncologists, medical physicists and radiation technologists to drive "quality" in radiation therapy. We do this by setting standards with guidelines, raising awareness of programs and driving a national system for incident reporting.

CPQR has changed the culture of radiation treatment safety in Canada. It is a trusted partner.

- Health Systems Leader

The CPQR's suite of guidelines helped us prepare for accreditation and to establish quality practice at our centre.

- Radiation Oncology Department Head



LEVERAGING DATA TO IMPROVE PATIENT SAFETY

A key element of radiation treatment quality assurance is learning from potential and actual errors that occur during treatment planning and delivery. The National System for Incident Reporting – Radiation Treatment (NSIR-RT), which was co-developed by CPQR and CIHI, is a powerful example of driving quality improvement and patient safety through collaboration between pan-Canadian Health Organizations and jurisdictional health system partners.

Simplifying incident submission

Manual incident entry and dual reporting to local and national reporting systems is a barrier for many who wish to participate in NSIR-RT. CPQR and NSIR-RT benefited from CIHI's partnership with BC Cancer and the BC Patient Safety and Learning System to launch a real-time automated data-transfer process.

It is important to remember that a decade ago, most radiation treatment programs in Canada only had local incident monitoring systems that were linked to hospital risk management programs and did not capture the granularity of detail required to inform quality improvement.

Today, NSIR-RT is used by 77% of all radiation treatment centres in Canada with particularly strong uptake in Quebec. Across the country this drives more granular data capture and sharing of learnings between cancer programs and jurisdictions.

NSIR-RT Committee: Established in 2018, the NSIR-RT Advisory Committee mines data to identify trends and make quality improvement recommendations to reduce incident propagation and improve patient safety, and issues safety advisories in response to requests from provincial radiotherapy leadership. These advisories include recommended actions for local programs and help prevent similar incidents from happening.

Publications: Since 2016 CPQR has issued a quarterly NSIR-RT Bulletin featuring case studies of trends found in submitted incident data along with valuable learning opportunities for the Canadian radiation treatment community. Today there are over 450 people subscribed spread across 6 countries.

International Partnerships: CPQR is a global leader in incident management and partners with agencies around the world to enhance the value and use of national reporting systems. As part of the European Society for Radiotherapy and Oncology (ESTRO) RT Quality Committee, we work with the American Society for Radiation Oncology (ASTRO), American Association of Physicists in Medicine (AAPM) and most recently the Te Aho Cancer Control Agency in New Zealand to coordinate what is captured and how we learn from RT incidents.

Becoming an expert

CPQR developed a free [incident investigation and learning course](#) in 2018. This e-based 8-module course helps participants learn to effectively investigate local incidents and introduce various tools to facilitate incident analysis

"NSIR-RT provides a critical common taxonomy so programs across Canada can share learnings and speak the same language when discussing radiation therapy incident."

– Health Systems Leader

OPTIMIZING TECHNOLOGIES TO DELIVER OPTIMAL CARE



In 2010, CPQR collaborated with COMP's Quality Assurance and Radiation Safety Advisory Committee (QARSAC) to conduct an extensive review of outdated radiotherapy technology standards. The process resulted in a suite of 16 equipment and technology guidelines, and an overarching technical quality control guideline – together termed the TQC Suite.

The TQC Suite helps provide direction to assure optimal performance of equipment and technologies involved in the planning and delivery of radiation treatment. It also serves as a concrete example of national collaboration. More than 40 individuals from 12 radiation treatment programs across Canada helped develop the daily, monthly, quarterly and annual testing parameters included in these documents. In-depth validation was undertaken by more than half the programs in Canada.

The rigorous and collaborative process helped position the TQC Suite as the pinnacle of technical quality in Canada. Today the guidelines drive a harmonized approach to quality assurance at every radiation treatment program in the country. The strong uptake of the TQC guidelines is recognized as an accomplishment internationally as well. To date, TQC guidelines have been adapted for use by centres in at least six other countries around the world.

COMP has played a pivotal role in guideline development over the years, and in particular is recognized for its collaboration with national stakeholders to develop the TQC Suite. Starting in 2021, COMP will serve in an important role as the new steward of these guidelines. They will ensure these important documents remain up-to-date and in collaboration with CAPCA will drive uptake by the Canadian radiation treatment programs.

Thank you to COMP and the entire medical physics community for your significant and sustained contribution to this work.

"Our entire QA program is structured around CPQR guidance and resources. This was extremely helpful and successful."

– Medical Physics Department Head

CPQR Technical Quality Control Documents

[Technical quality control guidelines for Canadian radiation treatment centres](#)

[Safety systems](#)

[Accelerator integrated cone beam systems for verification imaging](#)

[Brachytherapy remote afterloaders](#)

[Conventional radiotherapy simulators](#)

[Computed tomography simulators](#)

[CyberKnife](#)

[Data management systems](#)

[GammaKnife](#)

[Kilovoltage radiotherapy machine](#)

[Low dose rate permanent seed brachytherapy](#)

[Magnetic Resonance Imaging](#)

[Major dosimetry equipment](#)

[Medical linear accelerators and multi-leaf collimators](#)

[Patient-specific dosimetric measurements for modulated therapies](#)

[Positron emission tomography - computed tomography](#)

[Treatment planning systems](#)

PROMOTING PRACTICE HARMONIZATION TO IMPROVE CLINICAL CARE

Measuring the impact of specific treatment plans on patient outcomes improves clinical encounters. On a widespread scale, it helps determine optimal treatment protocols to make sure all patients benefit from high quality care.

In 2017, CPQR launched an initiative to support the increased use of patient reported outcomes (PROs) in routine radiation treatment practice across Canada. These efforts have helped build system capacity by providing guidance to radiation treatment programs on the collection and use of radiation treatment specific PROs and the adoption of standardized nomenclature.

In 2020, CPQR released [Guidance on the use of Patient Reported Outcomes for Canadian Radiation Treatment Programs](#), which provides recommendations on how to enhance and optimize the collection and use of PROs in routine clinical practice. In 2020, 68% of radiation treatment programs indicated that this guidance provided value to their program. To date, six provinces have adopted CPQR-endorsed PRO measures and have committed to participating in data collection and comparison.

While PRO measures are already improving clinical encounters and strengthening patient voices during care, partners now have a foundation to build increased harmonization and data comparison initiatives.

CPQR's newest guidance document [Guidance on the Use of Common Nomenclature and Data Sets in Canadian Radiation Treatment Programs](#) was released in 2021 and will strengthen the integrity of the underlying data, which is a critical pre-requisite for future widespread adoption of artificial intelligence in radiation treatment planning.

CPQR-endorsed PRO Measures:

[Edmonton Symptom Assessment Screening \(ESAS\)](#)

[Brief Pain Inventory](#)

[Expanded Prostate Cancer Index Composite \(EPIC\)](#)

[MD Anderson Symptom Inventory for Head and Neck \(MDASI-HN\)](#)

[Cervical cancer EORTC QLQ-CX24](#)



SUPPORTING EQUITABLE ACCESS TO RADIOTHERAPY

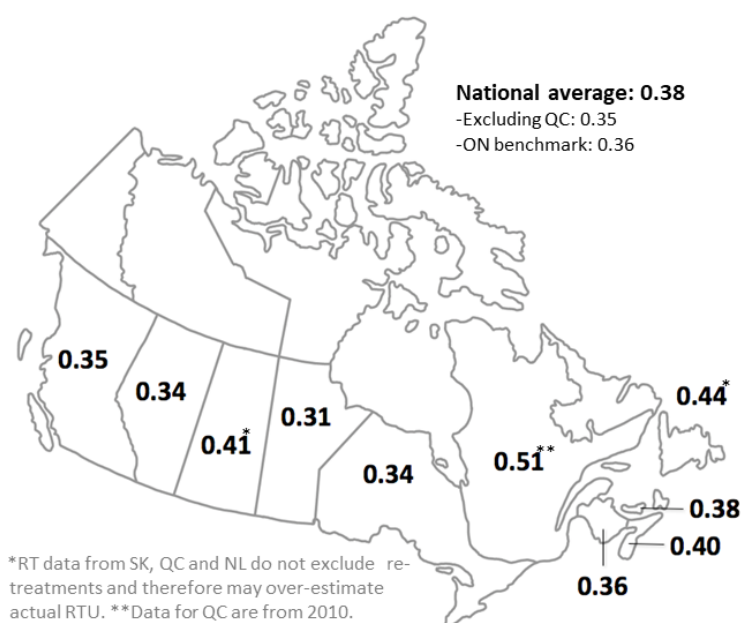
Half of all cancer patients would benefit from radiation treatment given its role in the curative and palliative management of many cancers¹. Unfortunately, many patients across Canada are not currently able to access radiotherapy.

In 2018 and 2019 CPQR worked closely with provinces to assess radiation treatment utilization (RTU) rates to help identify inequities in access to radiotherapy for at-risk populations. Results showed that gaps exist in access across Canada and all jurisdictions are falling short of benchmarks. The largest range in RTU was seen for lung cancers, and the smallest variation was seen for prostate cancer.

This work is also informing a circumpolar initiative to examine disparities in accessibility for Indigenous populations. Looking forward there is an opportunity to build on CPQR's foundational work by examining regional and health-care facility variation to support tailored approaches to address barriers.

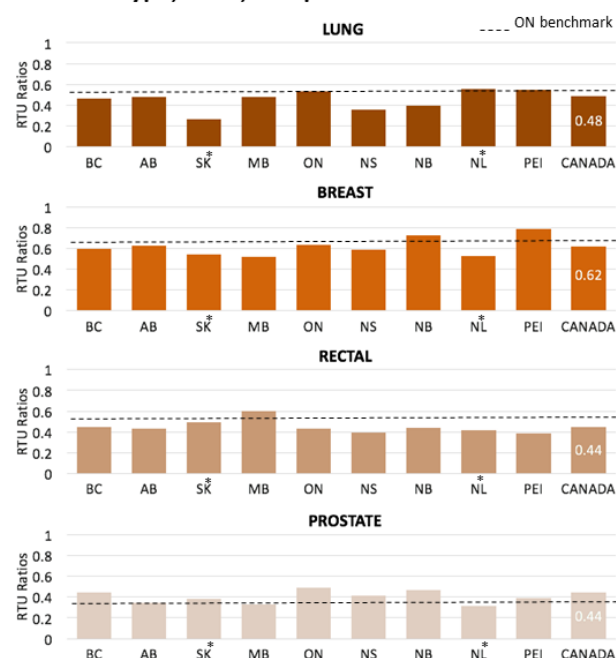
WHAT DID WE FIND?

Radiotherapy utilization ratios by province for all cancers combined, 2016, compared to Ontario benchmark



- Variations in RTU were observed across provinces in 2016, ranging from 0.31 in MB to 0.51 in QC.

Radiotherapy utilization ratios by province (excluding QC) and cancer type, 2016, compared to Ontario benchmark



- The largest range in RTU was seen for lung cancers (0.27 in SK to 0.55 in PEI and NL). The smallest variation was seen for prostate cancers.

¹G. Delaney, M Barton "Evidence-based estimates of the Demand for Radiotherapy" Clinical Oncology 27(2) 70-76 (2015).



DRIVING A VOICE FOR CHANGE THROUGH PATIENT-LED INITIATIVES

CPQR has long been committed to engaging patients in our work and in the development of tools. Since 2013, a dynamic group of patient representatives have helped us establish a comprehensive portfolio of patient guidance materials that contributed to improvements in care delivery over the past decade.

"CPQR brings the patient perspective to the clinic in a very tangible way."

– Radiation Therapist

Our patient volunteers also serve as patient advocates, elevating the patient voice in quality and safety activity nationally by collaborating on research projects and serving as panelists and speakers at conferences and symposia across the country.

Our [Patient Engagement Guidance for Canadian Radiation Treatment Programs](#) was released in 2016 to provide guidance on activities that radiation treatment programs can incorporate to ensure that patients and family members are adequately and appropriately engaged in the care they

receive. Elements of this work have also been embedded in national hospital accreditation through our partnership with Accreditation Canada.

Driven by one of our patient volunteer's desire to support the provision of high-quality patient education across the country, we released our [Patient Education Guidance for Canadian Radiation Treatment Programs](#) document in 2020. It provides guidance on activities radiation treatment programs can initiate to ensure patients and family members are actively engaged through education and information about their disease, treatment options and prognosis throughout their care journey.

CARO has been an important partner in this work over the last decade. CARO's commitment to high quality patient-centred care is reflected in CARO's new role as steward of the patient-centred programs.

On behalf of CPQR and the radiation treatment community, thank you CARO. These efforts will further enhance and promote the integration of CPQR's patient engagement, education and outcome guidance into professional practice across the country.



LOOKING TO THE FUTURE

With rapid advances in radiation treatment technologies, and landmark gains in our understanding of how to optimize patient care with radiotherapy, it is critical that the Canadian radiation treatment community and cancer system leadership continue to drive quality assurance. CAPCA's new CPQR Committee will enable this by:

- Serving as a pan-Canadian radiation treatment **network hub**;
- Providing **direct stewardship of programmatic quality** guidance and national radiation treatment incident reporting; and
- **Reinforcing important connections** between CARO, COMP and CAMRT and organizations that support the broader health system including CIHI, Accreditation Canada, CAPCA and CPAC.

As CPQR moves forward within CAPCA, we will continue to leverage our connections with front line staff to drive uptake of programs, while strengthening strategic connections with leaders across cancer programs and with critical pan-Canadian health organization. We will also continue to serve as a key enabler of the Canadian Strategy for Cancer Control to support the availability and delivery of world-class radiation treatment to everyone in Canada, no matter where they live.

CPQR is looking forward to the future and to ensuring that Canada remains at the forefront of radiation treatment planning and delivery by driving practice harmonization, improving quality and patient safety, and supporting equitable access to care for all Canadians.

Reflecting on the past decade, CPQR's guidance has helped our program make significant improvements, including the creation of a Radiation Treatment Quality Assurance Committee and an improved accountability structure. This allows us to regularly review how our program performs against key quality indicators. Thank you!

– Radiation Oncologist

CPQR STEERING COMMITTEE 2010 - 2021

Radiation Oncologists

Amanda Caissie, Nova Scotia (2015-2021)

Eshwar Kumar, New Brunswick (2012-2021)

Jeffrey Cao, Alberta (2012)

Lisa Barbera, Alberta (2017-2021)

Matthew Parliament, Alberta (2010-2014)

Michael Brundage, Ontario (2010-2021)

Michael Milosevic, Ontario (2010-2021)

Robert Olson, British Columbia (2017-2021)

Suzanne Drodge, Newfoundland (2013)

Medical Physicists

Crystal Angers, Ontario (2014-2015)

Jason Schella, Nova Scotia (2010-2011)

Jean-Pierre Bissonnette, Ontario (2010-2015)

John Kildea, Quebec (2016-2021)

Kyle Malkoske, Ontario (2014-2015)

Marco Carlone, British Columbia (2017)

Michelle Nielsen, Ontario (2012-2013, 2018-2021)

Peter Dunscombe, Alberta (2010-2013)

Tom Purdie, Ontario (2016-2019)

Young Lee, Ontario (2020-2021)

Radiation Therapists

Alison Giddings, British Columbia (2019-2021)

Brian Liszewski, Ontario (2015-2021)

Caitlin Gillan, Ontario (2010-2013)

Carol-Anne Davis, Nova Scotia (2014-2018)

John French, British Columbia (2010-2014)

MerryLee McGuffin, Ontario (2019-2021)

Cancer System Administrators

Anubha Prashad, Ontario (2016-2021)

Gunita Mitera, Ontario (2013-2015)

Maggie Keresteci, Ontario (2010-2012)

Patients

Lianne Wilson, British Columbia (2013-2021)

Louise Bird, Saskatchewan (2013-2021)

CPQR Executive Director

Erika Brown, Ontario (2010-2021)



CPQR Meeting, Halifax Nova Scotia 2019

L-R: Eshwar Kumar, Michelle Nielsen, Louise Bird, Michael Milosevic, Jessica Chan, Brian Liszewski, Jen Croke, Lisa Barbera, Erika Brown, MerryLee McGuffin, Lianne Wilson, Michael Brundage, Anubha Prashad, John Kildea, Corinne Daly, Charles Mayo, Amanda Caissie

Thank you!

The Canadian Partnership for Quality Radiotherapy would like to thank the Canadian radiation treatment community for contributing to our achievements.

Amanda Bolderston, Andrea McNiven, Anita Berndt, Annie Doiron, Annie Walker, Arman Rahmim, Beibei Zhang, Bobbi-Sue Clendenning, Brigit Jensen, Carlos Uribe, Carol Agapito, Carol-Anne Davis, Charles Kirkby, Charlotte Schultz, Cheryl Duzenli, Christiaan Stevens, Christina Parsons, Christine Black, Christophe Furstoss, Charles Mayo, Cody Harper, Corinne Daly, Craig Beckett, Crystal Plume Angers, Cyndy Penner, Dan La Russa, Danielle Carroll, Danielle Scott, Darin Gopaul, Del Leibel, Dominic Nadeau, Eduardo Villarreal-Barajas, Emilie Soisson, Eric VanderVoort, Erin Barnett, Esmaeel Ghasroddashti, Esther Green, Etienne Letourneau, Eve-Lyne Marchand, Fiona Mitchell, Francois Deblois, Gabrielle Robin, Gerard Lagmago Kamta, Grace Zeng, Greg Pierce, Haresh Vachhrajani, Helmut Hollenhorst, Horacio Patrocinio, Jean-Charles Côté, Jen Croke, Jenna King, Jennifer O'Donnell, Jenny Jin, Jessica Chan, Joe Hayward, John Agapito, John Amanie, John Schreiner, Jon Dysart, Jordan Hunt, Julie Goudreault, Justin Miskell, Karen Yendley, Kathryn Moran, Keith Wachowicz, Kim Rans, Konrad Leszczynski, Kristopher Dennis, Larry Pan, Laura Masucci, Laurent Tantôt, Leslie Hill, Liam Mulroy, Luc Beaulieu, Lyndon Morley, Manpreet Sohi, Marc Francois Cyr, Marc Gaudet, Margaret Anthes, Marie-Andree Fortin, Marie-Anne Froment, Marie-Eve Quirion, Marie-Joëlle Bertrand, Marie-Pierre Milette, Marie-Ross MacDonald, Marija Popovic, Marion Langford, Mathieu Guillot, Matthew Follwell, Michael Kim, Mike Oliver, Mona Delisle, Monique vanProoijen, Muoi Tran, Nancy Sheaves, Natalie Pomerleau-Dalcourt, Natasha Comuso, Noel Blais, Normand Frenière, Parminder Basran, Patrick Delage, Philip Wright, Philippe Després, Ran Klein, Rashid Dar, Rashmi Kool, Redouane Bettahar, Renee Belitski, Renée Larouche, Robert Corns, Robert MacRae, Ross Halperin, Ross MacDonald, Shazia Mahmood, Spencer Ross, Stephanie Freire, Stewart Gaede, Sunshine Purification, Suzanne Drodge, Ted Toriumi, Teo Stanescu, Teri Stuckless, Tim Olding, Todd Stevens, Tom Chow, Toni Vu, Trevor Campbell, Trisha Daigle-Maloney, Valerie Theberge, William Parker, Wayne Beckham, Yingli Zhao

Partners

