Ontario Health
Cancer Care Ontario

# Recommendations for Radiation Peer Review

## Guidance Update

May, 2021



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# ACKNOWLEDGEMENTS

Radiation Treatment Program, Ontario Health (Cancer Care Ontario)

Peer Review Quality Assurance Team, Ontario Health (Cancer Care Ontario)

Members of the Radiation Oncology Provincial Advisory Committee (ROPAC), Ontario Health (Cancer Care Ontario)

# EXECUTIVE SUMMARY

Radiation oncology peer review consists of the evaluation of a radiation treatment plan by a peer radiation oncologist to ensure that the plan is appropriate from both patient safety and treatment effectiveness perspectives.

This guidance document outlines the required quality standards for radiation oncology peer review across Ontario. This document is intended for Ontario Health (Cancer Care Ontario) (OH (CCO)) staff, Regional Cancer Centre (RCC) leadership, data administrators, clinicians, as well as others who require context around radiation oncology peer review in Ontario. The document builds upon the Radiation Oncology Peer Review Guidance Document developed in 2013, recognizing that peer review is now a standard of care for radiation treatment in Ontario.

The document provides a brief background and evidence-base for peer review, and outlines the recommendations for peer review from a broad radiation programmatic perspective. The recommendations aim to provide high-level guidance on the key elements of peer review, while allowing for flexibility in their implementation based on local and regional contexts.

The recommendations are organized into the following sections:

- Case selection
- Peer review process
- Roles and responsibilities of team members
- Data and documentation recommendations

The document concludes with some comments regarding provincial oversight, and potential future directions.

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# BACKGROUND

Radiation oncology peer review ('peer review') consists of the evaluation of the radiation treatment (RT) plan to ensure it is appropriate from both patient safety and treatment effectiveness perspectives. Peer review is designed to:

- Improve patient outcomes (efficacy and safety) by improving the quality of radiotherapy plans;
- Facilitate education for other RT team members;
- Ensure robust processes and quality improvement initiatives; and,
- Support best practice sharing, collaboration and open communication.

The evidence base supporting the effectiveness of peer review in achieving these outcomes includes data from Ontario, other provinces, and other countries. A reference list that includes selected key publications is included in the appendix.

While peer review requires an organizational culture that allows and encourages review of physician decisions from an inter-professional perspective, the responsibility of patient care remains with the attending oncologist, and recommendations from peer review will be implemented at their discretion.

The rationale for updating the Peer Review Guidance document stemmed from input received within the Radiation Oncology Provincial Advisory Committee (ROPAC). The ROPAC is responsible for advising the Provincial Head of Radiation Treatment Program on all matters relating to the discipline specific planning, implementation, and delivery of radiation services in Ontario. This has led to interviews conducted with Radiation Oncology Leads and respective team members from 12 cancer centres, to achieve saturation with respect to themes emerging during the interviews responses. The interview summary and proposed recommendations were brought forward to the Provincial Radiation Treatment Program Committee (PRTPC), where they were approved.

## Purpose

This guidance document outlines the required quality standards for radiation oncology peer review across Ontario. This document is geared towards Ontario Health (Cancer Care Ontario) (OH (CCO)) staff, Regional Cancer Centre (RCC) leadership, data administrators, clinicians, as well as others who require context around radiation oncology peer review in Ontario. The document is meant to build upon the Radiation Oncology Peer Review Guidance Document developed in 2013, given that peer review is a standard of care for radiation treatment in Ontario.

## Scope of Work

The document outlines the recommendations for peer review from a broader radiation programmatic perspective. For disease-specific peer review guidance for breast, head and neck and lung, please refer to the reporting section of the Radiation Treatment Program Website.

## Key Terms

The following are definitions of key terms used throughout the document:

- **Peer review**: The evaluation of the clinical decision, contours (e.g., target, Organs at Risk (OARs)), and dosimetry of a radiation treatment plan by a second radiation oncologist. For the

purpose of this document, review of the clinical decision alone (e.g., at a multidisciplinary case conference) is not sufficient for meeting the criteria for radiation oncology peer review.

  - **Primary Cases:** Peer review of a treatment plan targeting the primary cancer and regional nodes if relevant. For simplicity, all primary treatment plans are considered complex, even in simple radiation techniques are used for palliation of the primary tumour.

  - **Metastatic Cases:** Peer review of a new tumour and/or disease that has spread distant to the primary.
    - **Complex Cases**: Complex cases refer to the treatment of metastatic disease with high precision techniques (e.g., Stereotactic Body Radiation Therapy (SBRT), Intensity Modulated Radiation Therapy (IMRT)) for sites such as brain lung, liver and spine metastases, high doses per fraction, or re-treatment of metastases.
    - **Simple Cases:** Simple cases refer to all other metastatic treatment plans not falling under the "complex" category.

- **Inter-professional:** Refers to the peer group in radiation oncology, which typically consists of Radiation Oncologists, Physician Residents, Medical Physicists, Dosimetrists, and Medical Radiation Therapists. Nurses, while key members of care teams, are generally not involved in the peer-review process for radiation planning. Some elements of peer review can be delegated to members of the team with specific competencies based on departmental considerations.

# RECOMMENDATIONS

The following recommendations aim to provide high-level guidance on the key elements of peer review, while allowing for flexibility in their implementation based on local and regional contexts. They are organized into the following sections:

- Case selection;
- Peer review process; and,
- Roles and responsibilities of team members.

## Case Selection

The following recommendations will clarify which types of peer review should be conducted for which types of cases.

1. All treatment plans administered with primary intent should be reviewed. The target metric of 80% is based on striving for 100%, recognizing that this is not always possible.
2. All metastatic plans that are complex in nature (see categories below) should be reviewed (also with a target metric of 80%).
3. Selected simple metastatic plans should be reviewed (target 20%). Each radiotherapy program is expected to have a process for either random or targeted selection of these cases according to local program operations. An example of targeted selection includes re-treatment plans.

4. Peer review should occur before the start of treatment or prior to 25% of the total prescribed dose has been delivered. Additional peer review may occur at any point during treatment as issues and/or concerns about the treatment are identified (e.g., Cone Beam Computed Tomography (CBCT) review).

**Categories of Peer Review Cases**

In the *Peer Review Guidance* (2013), cases selection for peer review were classified as either Radical or Palliative. In the current document, the categories have been revised into Primary and Metastatic with "simple" and "complex" under metastatic peer review. In alignment with the development of the Radiation Treatment Quality Based Procedure (RT QBP), peer review methodology has undergone a few noteworthy changes. As of April, 2021, peer review will be reported at the protocol level. As such, for multi-phase protocols, as long as the first course is peer reviewed, the entire protocol will be flagged as peer reviewed. As well, the peer review intent has been revised from Radical and Palliative (simple, complex) to Primary and Metastatic (simple, complex). The below five protocols have been classified as simple metastatic at the protocol level:

**Simple Metastatic:**

| RT_PROTOCOL_CD | RT_PROTOCOL_DESC |
|---|---|
| BONE_MET_CON_SINGLE | Bone Mets- conventional RT- single |
| UNSPEC_MET_MULT_FRAC | Unspecified Met- conventional RT- multiple (not liver, bone, or brain) |
| UNSPEC_MET_SINGLE | Unspecified Met- conventional RT- single (not liver, bone, or brain) |
| BONE_MET_CON_MULTI | Bone Mets- conventional RT- multiple fractions |
| CNS_BRAIN_MET_WBRT | CNS Brain Mets-Whole brain |

All other Metastatic protocols that do not fall under the simple level will be classified as complex. The timing of peer review (e.g., prior to 25% of treatment delivery) will be based on the number of fractions in the reviewed protocol, or the fractions in the first course for multi-phased protocols. For simplicity, all primary plans will be considered as complex, even if simple palliative techniques are occasionally employed.

Please refer to the recent targets in Table 1. These revised categories aim to better reflect treatment complexity, disease progression, and technique involved.

**Table 1. Peer Review Targets (FY 21/22)**

| Fiscal Year: | 1. Primary Peer Review Provincial Performance Target | 2. Simple Metastatic Peer Review Provincial Performance Target | 3. Complex Metastatic Peer Review Provincial Performance Target |
|---|---|---|---|
| 2021/2022 | 80% | 20% | 80% |

## Peer Review Process

Peer review can occur in using a variety of approaches:

- **One-on-One Peer Review**

  **Description:** A second Radiation Oncologist reviews the primary Radiation Oncologist's treatment plan. This consists of an individualized process as per the centre's workflow (e.g., one-on-one meetings, review through patient chart, etc.).

- **Inter-Professional Team Peer Reviews**

  **Description**: A group that consists of various RT disciplines such as Radiation Oncologists, Physician Residents, Medical Physicists, Dosimetrists, and Medical Therapists, meet and discuss presented treatment plans in an in-person and/or virtual format to validate treatment plans, particularly those treated with more complex techniques.

- **Inter-Institutional Peer Reviews**

  **Description**: RT professionals from different institutions meet to discuss treatment plans. These inter-institutional peer reviews can occur in three ways: formal meetings (e.g., sarcoma), a joint meeting between a host and a partner centre, as well as informal meetings. It must include a robust and safe mechanism for facilitating the sharing of RT files. This approach is especially valuable for partner centres that lack certain expertise to gain access to centres with more experience in a particular disease site group/treatment technique for guidance and advice.

  **Case study examples:**
  - Royal Victoria Regional Health Centre & Sunnybrook Health Sciences Centre: Lung SBRT implemented jointly
  - Royal Victoria Regional Health Centre & Princess Margaret Hospital: Collaboration around cervix cases
  - Multiple Centres: Sarcoma peer review

- **Brachytherapy Peer Review:**

  **Description:** Brachytherapy cases typically involve the applications of interstitial or intracavitary radiation. Current evidence indicates that specialized technology such as interstitial brachytherapy or two fraction brachytherapy High-dose-rate (HDR), elicits improved patient outcomes in some disease sites. It is strongly advised that all brachytherapy treatments be peer reviewed, even post hoc. Brachytherapy peer review has important implications for programmatic quality. This form of peer review involves an inter-professional team, whereby ROs are primarily responsible for evaluating quality.

## Roles and Responsibilities during Peer Review

- All members of the team have a role in informing the peer review process.
- The peer review process is enhanced when it occurs in an inter-professional setting with participation from Medical Radiation Therapists and Medical Physicists.
- There are certain opportunities to delegate roles within the peer review process to additional team members, as required. For instance, Clinical Specialist Radiation Therapists (CSRTs) can take on advanced directives from physicians around the triage and preliminary review of peer review cases.
- Recommended team positions are outlined below:

| Role | Description | Recommended Team Member |
|---|---|---|
| Most Responsible Provider | • Leadership around patient safety and appropriate care decisions<br>• Liaise with inter-professional team, particularly as complexity of care increases | • Radiation Oncologist or delegate (e.g., CSRT)<br>• *Example:* Refer to the Walker Family Cancer Centre-Palliative CSRT roles and responsibilities in Appendix |
| Coordination and Case Triage | • Assisting in inter-professional coordination of cases for peer review | • Radiation Therapist, QA coordinator |
| Technological Safety and Support | • Alignment of technological applications to ensure appropriate treatment and safety measures<br>• Applicable analysis and reporting<br>• Treatment modifications, as required | • Medical physics |
| Image and Plan Coordination | • Provide image cataloguing as required<br>• Support equipment/treatment QA of complex plans | • Dosimetrist |
| Treatment Provision | • Make care decisions based on peer reviewed plan<br>• Adjust treatment parameters (e.g., positioning of patient), as required | • Radiation therapist, Radiation Oncologist |
| Administration and Data Management | • Support broader peer review program agenda, in relation to organizational plan/strategies<br>• Support patient safety goals and expectations | • Health administrator, manager, and/or delegate |

| | | |
|---|---|---|
| | • Monitor peer review data on an ongoing basis, and use as a platform for key decision making | |
| Information Technology Support | • Ensure appropriate functionality and connectivity of systems to support peer review | • IT professional, QA coordinator |

## Documentation

- The peer review process includes communication of recommendations to the attending oncologist (who may accept or decline to adopt the recommendations in accordance with their role as attending)

- Documentation of peer review may include: documentation indicating that peer review has occurred, recommended changes, as well as the outcome of the recommendations (e.g., plan changed or plan has not changed)

- Documentation may occur in the medical record, the treatment record, or offline, but should be consistent across cases.

## Peer Review Data

- The collection of peer review outcome data (e.g., change is recommended) by Regional Cancer Centres (RCCs) is strongly recommended
    - Peer review outcomes should be recorded and regularly reviewed by the centre, according to specific institutional practices

- RCCs are strongly encouraged to analyze centre-specific peer review outcomes, and factor in results into programmatic improvement initiatives and monitoring

- Data and quality expectations around peer review may be cross referenced with the Canadian Partnership for Quality Radiotherapy (CPQR) and Accreditation Canada guidance.

## Provincial Oversight

- The mandate of OH (CCO) is to work alongside its provincial partners in order to effectively connect and coordinate parts of the health care system to ensure that Ontarians receive the best care possible. The collaboration between OH (CCO) and RCCs will help facilitate local peer review to ensure patient safety and treatment effectiveness.
- Peer Review aligns with the following strategic objective of the "Safe" goal in the Ontario Cancer Plan 2019 to 2023, and it is also a key area of focus within the Radiation Treatment Program's Implementation Plan 2019-2023
    - Over the next 4 years, the program will work with RCCs to strengthen all aspects of the safe delivery of radiation treatment. A key focus is the advancement of safety through further development of the Peer Review Quality Assurance Program (introduced in 2013)

- As part of this goal, the work plan will focus on four initiatives:

    1) Define and document elements for best practice peer review in the primary and metastatic domains and develop a process to measure adherence to these recommendations;

    2) Develop and implement novel peer review strategies in other aspects of radiation treatment (e.g., medical physics and radiation therapy plan checks);

    3) Investigate the possible role of artificial intelligence approaches in peer review; and,

    4) Establish and facilitate peer review between regional cancer centres to support reduced variation in radiation treatment delivery across the province and facilitate the delivery of advanced treatment approaches closer to home.

- The mandate of RCCs is to address all aspects of safe radiation treatment planning and delivery, including:
    - The organization of radiation treatment programs
    - The qualifications of the personnel involved in radiation treatment
    - The performance of the planning and treatment equipment
    - Policies and procedures, and
    - Monitoring and reporting of incidents.

# FUTURE DIRECTIONS

In summary, the intent of the document is to highlight the required quality standards for radiation oncology peer review across Ontario. Future considerations for peer review must be centred on:

- The development of a robust and reliable process for the sharing of peer review data across provincial cancer centres
- Enhanced inter-institutional peer review processes consisting of robust and safe mechanisms for the inter-provincial sharing of RT files
- The role that automated peer review and artificial intelligence (AI) can play in enhancing the reliability of treatment planning, as well as identifying outliers

For more information on peer review, please consult the references outlined in the appendix.

# Appendix

PEER REVIEW GUIDANCE: PALLIATIVE RADIATION TREATMENT CASES
WALKER FAMILY CANCER CENTER
DEPARTMENT OF RADIATION MEDICINE (May 2021)

**Background:**

Radiation Oncology palliative peer review of metastatic treatment plans is an essential component of quality assurance within the Radiation Medicine clinical program. Adherence to peer review at Walker Family Cancer Center (WFCC) is required to conform to the Canadian Partnership for Quality Radiotherapy, and the Accreditation Canada Q-mentum Module for Radiation Oncology.
At WFCC, the Metastatic Disease Peer Review Program is managed by the Palliative Clinical Specialist Radiation Therapist (pCSRT). The pCSRT reviews **all** Palliative Treatment Plans prior to Radiation Oncologist peer review and radiation therapy treatment delivery. Patient priority, treatment complexity, retreatments and dose fractionation are essential components for the WFCC palliative peer review (PPR) process.
The implementation of the WFCC pCSRT **Electronic** Peer Review Process has provided an exemplary Quality Assurance Program consistently achieving above the Cancer Care Ontario provincial target rate.

**WFCC PPR Guidelines:**

| | |
|---|---|
| **SINGLE FRACTION** | **Prior to Treatment Delivery, all single fraction radiation plans require a second Radiation Oncologist treatment plan review** |
| **MULTI-FRACTION** | Prior to 25% Treatment Delivery, radiation plans require a second Radiation Oncologist Treatment Plan review |

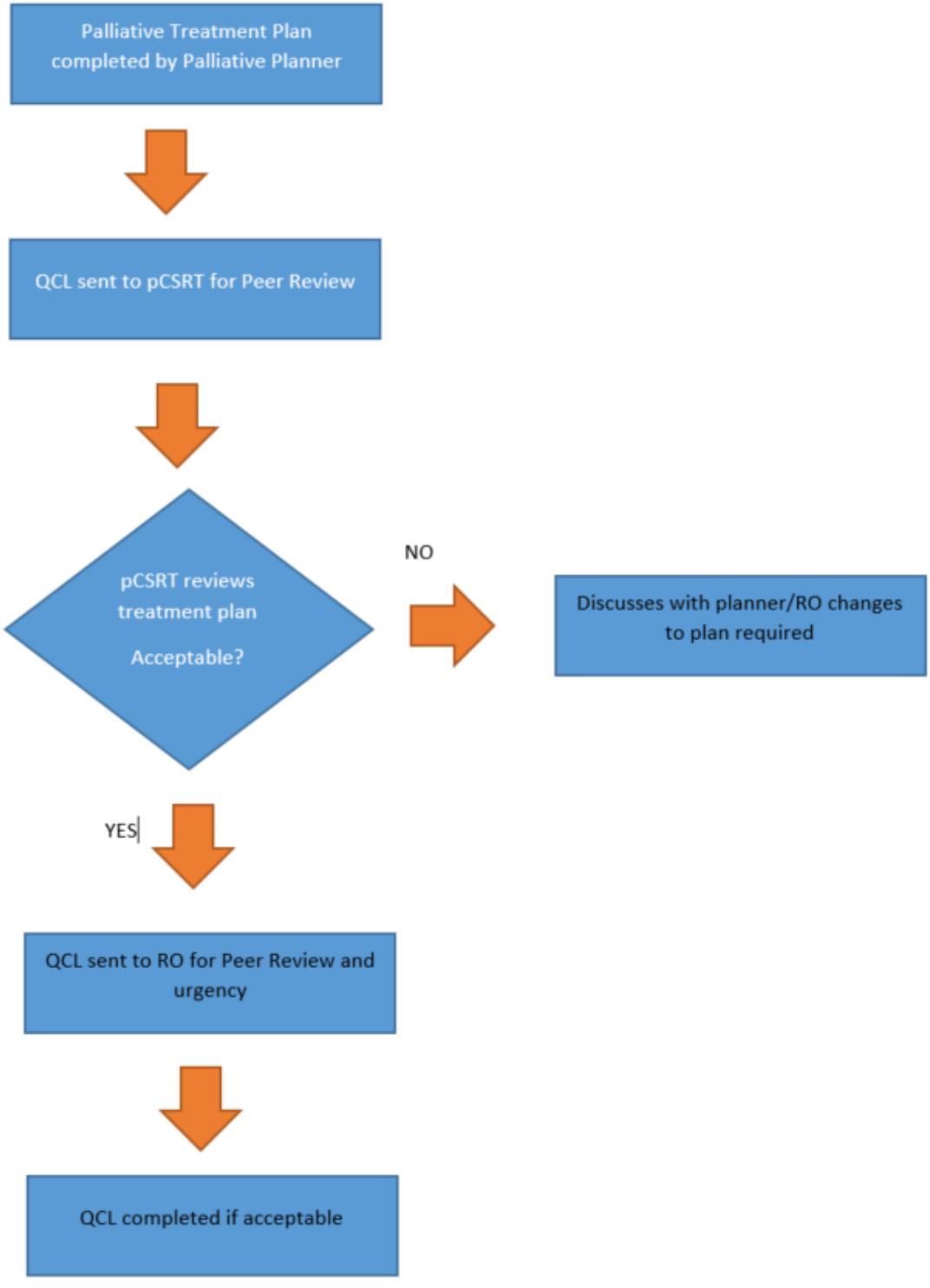
**WFCC PPR Electronic QA Process:**

- Planner to call / qcl pCSRT for urgent palliative peer review (PPR)
- Non urgent cases require a QCL sent to pCSRT, attached to careplan
- pCSRT qcl's RO for Palliative Peer Review after initial QA with comments indicated in qcl
- pCSRT speaks with RO if discrepancy or concern of treatment plan
- Changes to treatment plan are communicated to pCSRT and treatment planner by RO

**pCSRT independent quality assurance of treatment plan reviews the following**:

| **RO Prescription Dose and Fractionation** |
|---|
| Beam arrangement |
| Beam energy |
| Clinical Target Volume |
| Organs at Risk (OARs) |
| Complexity: Retreatment/Overlap/BED/Composite Distribution |
| Pre Treatment Medication |

WFCC PALLIATIVE PEER REVIEW PROCESS



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